

## ID Cover Page

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# **The Effect of 2022's Economic Downturn on the EU Venture Capital Market: A Complementary Analysis from a Venture Capital and Start-Up Perspective**

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**The Effect of 2022's Economic Downturn on the EU Venture Capital Market: A  
Complementary Analysis from a Venture Capital and Start-Up Perspective**

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## **Abstract**

This research paper investigates how the current economic downturn affects the EU Venture Capital and start-up market. Hence, to gain a comprehensive market overview, the general impact on investment activity and start-ups was analyzed, before exploring the impact on screening criteria of investments and non-financial value adds of VCs. Expert interviews were therefore conducted with 11 early-stage VCs and 7 start-ups and complemented by investment data of Crunchbase. Findings included a slight decrease in investment activity since Q3 2022, changing investment themes, a focus shift in screening criteria and non-financial value adds as well as changing needs of start-ups.

### Keywords

[Venture Capital – Start-up – Early-stage – Economic Downturn – Investment Activity – Selection Criteria – Value Add]

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# 1 Introduction

## 1.1 Relevance of the Topic

After Covid-19 caught the world off guard, many nations were facing significant issues. The coronavirus claimed countless lives and posed complex challenges for politicians. Therefore, decisions had to be made for the community's well-being, which significantly impacted the economy. Companies began to stumble, various European governments introduced aid programs to support the economy and minimize damage (European Commission 2020).

From then on, the economy could have focused on recovery had it not been for further disruptions. The next crisis appeared with the Russo-Ukrainian war, accompanied by Russia's invasion in February 2022. Numerous sanctions by European countries have been imposed in solidarity with Ukraine and to weaken Russia. The termination of business relations with Russia, e.g., gas imports, has been putting pressure on the European economy ever since. The alternative procurement measures have led to an increase in gas prices. However, the impact of the war is not limited to gas prices but more fundamentally to commodity, energy, and food prices, as well as general trading activities (IMF 2022b). All these effects have been fueling inflation. While interest rates rose more than usual in 2021, they increased even stronger this year. In September, the inflation rate in the Euro area and the UK was 10% and 9.9%, respectively (IMF 2022b; European Commission 2022). To reduce inflation to the target rate, the ECB has already raised interest rates several times, which currently account for 2.0%. In comparison, the interest rate has been at 0.0% since October 2016 and was raised for the first time in July 2022 to 0.5%.

Additionally, China's zero-Covid strategy has been leading to further trade difficulties. The demand for products from abroad has been falling sharply in the country. In addition,

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production capacities have no longer been fully utilized, which in turn has been leading to supply chains being continuously disrupted on a massive scale globally (IMF 2022b).

To sum up, companies are currently facing increased production costs, difficulties in the supply chain, high investment costs, and uncertainty about developments in the coming months (European Commission 2022). The effects these aspects have had on the economy so far are reflected in the GDP development. After the outbreak of the pandemic in 2020, the GDP growth rate dropped to -5.88%. In the following year, the economy fully recovered, recording a GDP growth of +5.4% (Aaron O'Neill 2022). Nevertheless, for 2022, the IMF (2022a) expects GDP growth to decrease to +3.2%. By 2023 the accumulation of crises is expected to cause the growth to decrease to +0.5. Therefore, an economic downturn can no longer be denied.

While large companies are starting to suffer under these circumstances, as shown by the increased layoffs, especially within the technology industry, the question arises of how smaller players are faring. Being one of the only financing options during the early periods of a firm's life, Venture Capital significantly influences the development of innovation and start-ups, and hence on countries' economies (Samila and Sorenson 2011), which means that a decrease in the amount of VC funds provided would result in a funding gap for innovation. However, vice versa, the economy influences VC activity (Cumming and Johan 2012). This is because VC investments are cyclic, meaning they often follow the economy and increase in periods of economic growth and decline in recessions (P. Gompers et al. 2008a; Bernstein, Lerner, and Mezzanotti 2019).

Past crises, such as the dot-com crash or the financial crisis, can illustrate the extent of an economic downturn on the entrepreneurial system (Aragon, Martin, and Shi 2019; Hochberg, Serrano, and Ziedonis 2018; Block and Sandner 2009; Block, de Vries, and Sandner 2012; Conti et al. 2019; Pianeselli 2019). It is, therefore, interesting to investigate how the crises of recent months and the resulting economic downturn are impacting the VC market.

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## 1.2 Research Objective and Contribution

Based on the beforementioned interdependence of the economy and the private market, this thesis aims to examine the impact of the current economic downturn from both VC and start-up perspectives. Given the recency of the topic, no academic research has been conducted yet. Hence, it is crucial to learn how the entrepreneurial system reacts to the crises described above to gain further insights for practice.

To understand the current developments in the VC market, the analysis first addresses current VC activities from an overarching perspective. The impact of these activities on start-ups will be examined in the next step. Moreover, the behavior of VCs is examined on a deeper level to derive implications for the entrepreneurial system. For this purpose, the thesis first refers to the pre-investment phase. Therefore, this paper will investigate the screening criteria used by VCs to make an investment decision. Furthermore, the influence of the economic downturn on the post-investment phase will be analyzed. For this purpose, the non-financial value-adds that VCs offer their investments will be analyzed. To complete the investigation of the entrepreneurial system and thus the implications, the points mentioned above will also be addressed from the start-up perspective. Derived from this, the following research questions arise. Additionally, Figure 1 shows the structure and interrelationship of the four research questions.

*RQ1: How is the current economic downturn affecting the EU VC market from an investor and start-up perspective?*

*RQ1.1: How does the current economic downturn influence the investment activity of early-stage VCs?*

*RQ1.2: How does the current economic downturn and its implications on the VC market impact early-stage start-ups?*

*RQ1.3: How does the current economic downturn impact the screening criteria of early-stage VCs?*

*RQ1.4: How does the current economic downturn influence the post-investment behavior of early-stage VCs and the associated non-financial value add?*

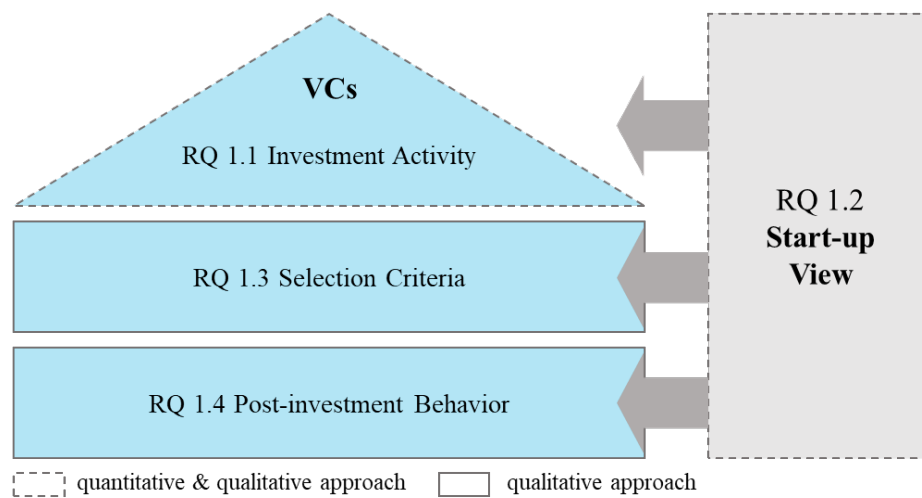


Figure 1: Interrelationship of the research questions  
Source: Own Illustration

The academic and practical contribution will be validated by combining theory, interview data, Crunchbase data, and critical analysis on the topic. As a result, the thesis examines clear implications for theory and practice and indicates future research avenues.

### 1.3 Course of Investigation

To structure the work, the thesis is organized into seven sections: introduction, theoretical foundation, literature review, methodology, findings, discussion, and lastly, a conclusion.

The theoretical background (Chapter 2) offers an overview of the most relevant aspects needed to understand the research questions, objective, and discussion. This section

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introduces terminology definitions for essential terms and theories used during this thesis. In the subsequent Chapter 3, literature research on several relevant topics was conducted to gain an understanding of the background of the research topic. Therefore, firstly the evolution of VCs in Europe was described before explaining the mutual dependence of the economy, VC activities, and start-ups. Next, VC investments during past crises will be used to understand how the current economic downturn could influence investment activity. Subsequently, the first studies of the impact of the Covid-19 crisis on VCs and start-ups will be examined. In the last two chapters of the literature review, the current state of selection criteria and the post-investment behavior of VCs will be analyzed to be able to compare it in Chapter 5 with the findings of this research. In Chapter 4, first, the methodology of the empirical study is explained, which outlines the research design and method, data selection and collection, and the analysis. The study is of quantitative and qualitative nature and follows a deductive-inductive approach, according to Mayring (2014). Next, the findings chapter (Chapter 5) investigates the four underlying research questions, constituting the practical part of the thesis. Therefore, qualitative data is used, complemented by quantitative, to round off the results. Subsequently, in the next chapter, each research question will be discussed, comparing the interview and Crunchbase results with the existing literature on a meso-level and structured way. This is followed by a discussion that combines the four research questions to answer the overall research question of this thesis. This part also provides managerial implications and reflects several limitations of the thesis. Finally, this thesis provides a conclusion in Chapter 7.

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## 2 Theoretical Foundation

This chapter's purpose is to define basic terms and core theoretical concepts that are essential for the thesis' research questions, including a definition of VC, its' stages, types, and model of VC funding, and a definition of start-ups.

### 2.1 Venture Capital Definition

VC funds raise money from wealthy individuals and institutions. This money is then invested in start-ups and entrepreneurial ventures, which often involve a high degree of risk and uncertainty (George, Cincera, and Bottazzi 2001; Sahlman 1990). Therefore, venture capital can be defined as one form of private equity investment that can be executed in different stages of a start-up (Jeng and Wells 2000) and is nowadays considered one of the most appropriate forms of financing entrepreneurial ventures (George, Cincera, and Bottazzi 2001). VC deals, however, are characterized by a high degree of uncertainty and information asymmetry on both sides, start-ups and VCs.

The idea of the VC model is to invest in a young company until it has reached a specific size and market position so that the acquired equity can be sold to a corporation, or an initial public offering (IPO) is carried out, and the acquired equity is thus liquidated again. Therefore, a VC investment is usually designed so that the VC maintains the shares acquired through the investment for a certain period of time through financial and non-financial activities and then exits again in exchange for a higher return (Zider 1998).

Different types of VC firms characterize the VC market such as governmental, bank-affiliated, corporate, or Independent VCs (IVC) (Luukkonen, Deschryvere, and Bertoni 2013; Bertoni, Colombo, and Quas 2015; Chemmanur, Loutskina, and Tian 2014; Andrieu and Groh 2012). VC firms differentiate by their ownership, governance, and investment horizon (P. A. Gompers 1996). Further, VC companies can have different motives for making investment decisions

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(Hellmann and Puri 2002). As a result, the focus of investment objectives differs for each type of VC (Siegel, Siegel, and MacMillan 1988). The lifespan of IVCs, for instance, is constrained to several years, and the capital provided to the entrepreneurial company often is limited by the initially contracted funding amount. IVCs focus mainly on financial returns. Many have a specific industry focus, allowing them to acquire the expertise to understand the entrepreneurial company's environment and become a sparring partner (Dushnitsky and Shapira 2010; Manso 2011; P. Gompers, Kovner, and Lerner 2009).

## **2.2 Start-up Definition**

Forbes Magazine used the term "start-up" in 1976 to characterize a company representing an investment opportunity based on innovative technologies (Kariv 2022). Today, the term "start-up" is associated with young firms bringing innovative products or services based on state-of-the-art technologies that address current shortcomings or unaddressed demands. They are often pioneers in new industries that they create with their businesses (Kariv 2022). The primary purpose of start-ups is to commercialize innovations and technical concepts, culminating in a running business (Goktan and Miles 2011). They are innovative disruptors of the status quo, which is the fundamental differentiation between start-ups and other SMEs. Moreover, start-ups are often in their initial stages of development with few employees (Wellfound 2022) and are designed to scale through lean, agile, and trial-and-error methods until they reach the size of a viable business (Blank and Dorf 2012). Throughout this thesis, whenever start-ups are addressed, the focus lies on early-stage firms.

## **2.3 Stages of Venture Capital Financing**

During its lifetime, a start-up will likely raise multiple financing rounds and progress through different stages of VC financing. Different sources have different definitions and terms for the individual stages, so it is essential to clarify the terminology used throughout this thesis.

Start-ups usually begin with Pre-Seed or Seed funding, proceeding to Series A, Series B, and Series C and following the order alphabetically. This thesis will distinguish between the following stages: Seed stage, early-stage, growth / later-stage, and exit, shown in Figure 2. In general, funding amounts and ticket sizes increase from the Seed stage to the later stage, while risks are associated with the start-up's future cash flow and, therefore, the risk associated with the investment decreases (Puca, 2020).



Figure 2: Funding Stages  
Own illustration

Pre-Seed funding is provided to help start-ups develop a business idea and to build a product or service prototype to evaluate the business idea (Peterdy 2022; Fowler 2021). Investors are usually friends, family, and micro-VCs, while round sizes are below \$150k (Fowler 2021; Crunchbase 2021). Seed funding is usually offered by angel investors, friends and families, and VCs to support developing the business idea into a product. Hence, the investment usually funds the R&D of new products and services and research into prospective markets, which usually ranges between \$10k-\$2M (Peterdy 2022). Investments into early-stage start-ups, on the other hand, which come in the form of Series A financing rounds (\$1M-\$20M), are made to help set up initial operation and production, as well as to support product development and marketing (Peterdy, 2022). Whereas early-stage start-ups usually have first revenues already, operating expenses are still significantly higher due to R&D and product development costs (Puca 2020). When looking at the later stage start-ups, Puca (2020) describes them as ventures with high revenue growth but usually still negative cash flow due to capital that is needed for expansions or product improvements. Therefore, start-ups are considered later, starting at Series B+ financing rounds with round sizes starting at \$20M (Crunchbase 2021). As the start-up

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continues to grow and margins improve, founders may consider an IPO or merger & acquisitions (M&A) exit. This phase of the later stage is also called the mezzanine or bridge stage, as it marks the final stage of VC and represents the transition to a liquidity event. At this stage, the start-up has received maturity and needs financing to support an IPO or M&A, while many investors will now likely sell their shares and earn a significant return on investment (ROI) (Fowler 2021).

## **2.4 Model of Venture Capital Funding**

VCs evolved into essential financial and non-financial intermediaries, supplying start-ups with capital and advice in times when the investment would be too risky for standard financiers, such as banks, who usually require substantial collateral (Audretsch and Lehmann 2004). The high level of risk stems from the nature of young companies: Upon investment, the investor faces information asymmetry, uncertainty, and a lack of tangible collaterals (Kaplan and Lerner 2016). As a protective mechanism against downside risks and to benefit from the upside potential that nascent venture investments entail, VCs include a variety of clauses in term sheets, allowing VCs to prevent dilution and benefit from valuation appreciation (Gompers and Lerner 2001a). Venture investments are meant as a short-term investment, signifying that the invested money is used to grow the investee, increase the value of the equity stake, and ultimately, sell the equity holding and exit the company. The investment process and VC activity are divided into three steps – Fundraising, investing and exiting (Gompers and Lerner 2004). The following section examines an overview of the three steps.

### **2.4.1 Venture Deal Overview**

Figure 3 describes the exemplary structure and governance of venture deals. Entrepreneurs need capital to fund their businesses, which they receive from VCs. Previously, this capital was raised by the management of the VC fund, the general partners (GPs) and from limited partners

(LPs) (Zider 1998). The GPs administer the raised capital, also called committed capital, and allocate it to start-ups, i.e., make a decision regarding which start-up receives funding. Capital that is committed but not yet allocated is referred to as *dry powder*. Once the LPs receive their return after an investment is exited via various avenues, such as IPOs or M&A, the remaining profits are split between the LPs and GPs pro-rata, commonly referred to as the GPs' carried interest of typically 20% (Klonowski 2022). Additionally, GPs receive an annual management fee of typically 2% of the fund's committed capital as compensation and cover for the operational costs of the fund (Behr and Murray 2013).

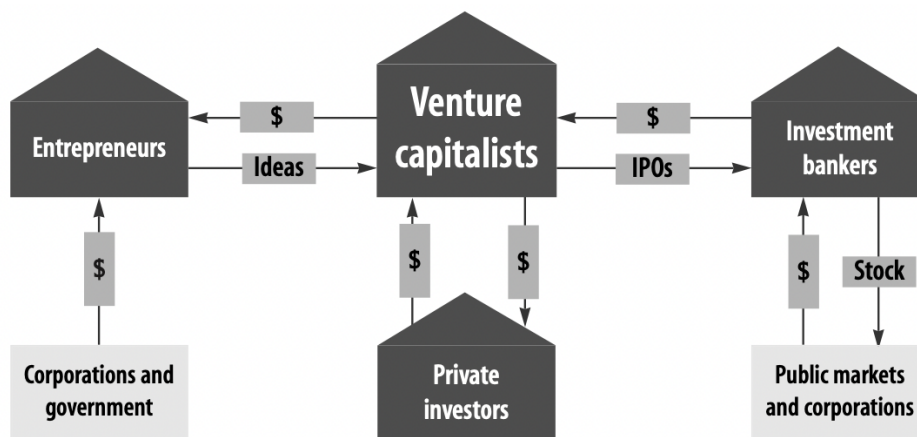


Figure 3: Venture Capital model

Source: Zider, B. (1998). How Venture Capital Works. Harvard Business Review, 131–139.

## 2.4.2 Fundraising

VC firms operate via partnerships. They raise funds from LPs, who are typically large institutions, such as pension funds, insurance firms, universities, and high net-worth individuals (Kaplan and Lerner 2016). These investors aim for an annual ROI of 25% to 35% due to the high risk associated with this asset class (Sahlman 2022; Zider 1998).

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### 2.4.3 Investing

Regarding the investment criteria, VCs typically evaluate firms among three dimensions: the product or service idea, the founders, and the industry in which the firm operates. Additionally, the timing of the investment is critical for the firm's success. Usually, investors reduce the investment risk by making the investment with other funds or financial intermediaries, with one lead investor and other co-investors, often referred to as a club deal (Zider 1998). Chapters **Error! Reference source not found.** and 5.3 will evaluate and contextualize such investment criteria in further detail.

### 2.4.4 Exiting

The goal of a VC is to exit, i.e., sell, an investment for a high return, generally expecting an ROI of 10x the initial investment within a usual time horizon of ten years (Zider 1998; Gompers and Lerner 2004). Therefore, VCs exit via IPOs, M&As or the sale to another financial investor, also called secondary sale (Gallo and Verdoliva 202). The preferred option for VCs is holding their investment until it reaches enough maturity for an IPO, or an M&A deal, due to the higher payoff the VC achieves with these transactions. The secondary market may open the possibility of divesting poorly performing firms, particularly when LPs are dissatisfied with the performance or when VCs aim to sell off a portfolio upon the end of a fund's time horizon to obtain liquidity (Andrieu and Peter Groh 2021).

## 3 Literature Review

The following chapter summarizes the current research status of VC and start-up activity in Europe and explains the theoretical foundations. Based on these findings, areas are identified

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that will be investigated in Chapter 5. Therefore, firstly the evolution of VCs in Europe will be described. Next, the mutual dependence on the economy, VC activities and start-ups will be explained before taking a closer look at VC investments during past crises. After that, the current research status about the influence of the past years' crises on the VC and start-up market will be presented. The last two chapters will then give an overview of the selection criteria and post-investment behavior of VCs.

### **3.1 The Evolution of VCs in Europe**

The first form of Venture Capital, American Research & Development Corporation (ARD), was invented in 1946 in the US by former MIT President Karl Compton, Harvard Business School Professor General Georges F. Doriot, and other Boston public leaders. One of the reasons for this was World War II, which induced the US to push technological innovation. However, even though ARD already possessed some characteristics that can be found in today's VCs, it was a close-end fund, meaning that shares were sold upfront to investors and later could be traded at a public exchange (Lerner and Nanda 2020). The first fund with limited partnerships, as we know it today, was founded by Draper, Gaither, and Anderson in 1958. During the 1970s and 1980s, the VC market experienced a significant increase reaching a volume of 4 billion USD (Gompers & Lerner, 2001).

At the same time, the VC market developed in Europe, initially in Germany, France, Italy, and the UK. Unlike the US market, Europe faced difficulties, and the capital raised was insufficient to supply the young companies adequately. Kannianen and Keuschnigg (2004, 61) conclude that European countries' institutional environment often hindered the development of the VC market. Eventually, institutional conditions improved, and the VC market soon expanded. Although most European countries experienced a drop in 2000 and 2001 during the dot-com crash (Aragon, Martin, and Shi 2019; E. Sohl 2003; Hochberg, Ljungqvist, and Lu 2007), the UK increased its growth significantly by focusing gradually on early-stage start-ups. As the

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competition for later-stage investments increased, many VCs turned their attention to young high-tech ventures, where uncertainty was high, which increased the risk but also the potential return (Lockett, Murray, and Wright 2002).

By 2005 Europe was able to catch up in size with the US VC market. The amount invested by VCs as a percentage of GDP was 0.19% and 0.23%, respectively. In the years after, both the amount and the number of deals grew even more due to advancing digitization and globalization. In addition, many of the tech leaders from the US started success stories in Europe, further accelerating the European start-up community (Gallo and Verdoliva 2022). However, after rebounding from 2004 to 2007, the amount and number of deals and venture-backed IPOs dropped again in 2008 due to the Global Financial Crisis (de Vries and Block 2011; J. Block and Sandner 2009). Since then, VC activity in terms of funds raised, number of deals, and funding amount recovered steadily. For instance, from 2009 to 2019, the value of VC funds raised in Europe increased from 3.5 B USD to 16.7 B USD (Invest Europe 2022). In 2020, when the Covid-19 pandemic hit, this changed again. The VC sector's reaction to this crisis will be analyzed in more detail in Chapter 3.4.1.

## **3.2 The Mutual Dependence of the Economy, VC Activities and Start-ups**

To better understand the theoretical background of this thesis and how economic changes impact the VC and start-up market and vice-versa, the following two chapters will address both the VC and the start-up perspective.

### **3.2.1 VC Perspective**

Since the emergence of the first VC fund, it has impacted the global economy remarkably (Bygrave and Timmons 1992). Due to the inherent risk of young ventures in Chapter 2.2, VCs are often the only funding source. Therefore, VCs fill this gap and provide start-ups with capital, despite uncertainty (Block and Sandner 2009). To reduce the uncertainty, VC investors often

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get a detailed and deep insight into the start-ups and perform due diligence before investing. As early-stage start-ups often bring very innovative business models along, a weakened VC market, for example, through less investment in VC funds, can lead to a slowdown in economic development and growth, which harms the economy as a whole (Block and Sandner 2009).

In contrast, increased VC activities in a country can significantly drive the growth of companies, technological development, and the emergence of new industries. Thus, VC positively impacts the economy as a whole and increases prosperity with innovative solutions. Kortum and Lerner (2000) even find that about 10% of US innovations may be attributed to the influence of VCs. Simultaneously, the literature shows that VC activity depends on an economy's general health and several macroeconomic factors (B. Black and Gilson 1998; J. Block and Sandner 2009; Bygrave and Timmons 1992; P. A. Gompers and Lerner 1999). For instance, Gompers and Lerner (1999) find that a higher GDP and increasing R&D spendings result in increasing VC activities. These findings are underlined by Jeng and Wells (2000). They argue that IPOs, the GDP, labor market rigidities, accounting standards, private pension funds, and government funds have a significant impact, with IPOs being the most influential.

Gomes, Santana Félix et al. (2013) analyzed various determinants influencing the VC market and start-up and founding activities in Europe. The authors find a positive correlation between macroeconomic expansion and VC investments. The positive correlation occurs because GDP growth positively impacts both VC supply, as periods of high profitability attract more investors willing to invest in VC funds (Gomes Santana Félix et al. 2013). On the demand side of VC, there is also a positive correlation between start-ups and GDP growth. Thus, when an economy is doing better, the number of start-ups increases and, therefore, the need for VC investments (Jeng and Wells 2000; P. A. Gompers and Lerner 1999).

Besides GDP growth, interest rates also influence the VC and the start-up market. If interest rates rise, it is assumed that there will be a lower supply of VC, as other investment

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opportunities may become more attractive to LPs, such as investing in bonds. On the VC demand side, the effect of interest rates is not entirely straightforward. On the one hand, high interest rates make VC funding more attractive for start-ups, as it is cheaper than funding from financial institutions. On the other hand, fewer start-ups are founded because there are fewer economically viable projects. Thus, when assessing the impact of interest rates on start-ups, it depends on which of the two effects predominates and can therefore be positive or negative. Gomes, Santana Félix et al. (2013) discover that the negative impact of higher interest rates can even be offset by the increased attractiveness of VC funding for start-ups. Similarly to the interest rate, the unemployment rate also negatively impacts the supply of Venture Capital, as high unemployment rates are usually associated with lower expectations for the economy (Gomes Santana Félix et al. 2013). Finally, a vibrant IPO market and M&A activity also have a positive impact, as they serve as promising exit opportunities for investors from their investments with high returns and thereby additional increase the supply of VC (Gomes Santana Félix et al. 2013). According to the authors, the attractive M&A market plays a significant role nowadays, as these are often associated with higher returns.

### **3.2.2 Start-up Perspective**

Similar to the interdependence of the VC market and the economy, the creation and growth of start-ups are strongly correlated with overall economic cycles (Audretsch and Acs 1994). Start-ups are essential contributors to the economic health and are entwined with boom-and-bust cycles (Howell et al. 2020). Therefore, in entrepreneurship, there are different push and pull factors originating from the economy (van der Zwan et al. 2016). As such, the economy can serve as a push factor in times of high unemployment, when people are pushed towards self-employment (Amit and Muller 1995; Dawson and Henley 2012). Pull factors

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relate to market opportunities that the entrepreneur can use to launch a business, who are subsequently called opportunity entrepreneurs (Vivarelli 2004).

Devece et al. (2016) find that some types of ventures perform better during recessions than during boom times and described innovation as a critical factor in achieving success during economic downturns. During recessions, there are usually fewer entrepreneurial initiatives (Fairlie, 2013). However, there are many successful ventures that were founded during times of recession (Nanda and Rhodes-Kropf 2013), such as Airbnb and Uber (Fang 2020), as these companies endured considerable challenges posed by complex economic environments and were able to do so with limited resources (Hodgson 2022). This is further confirmed by the fact that job creation by start-ups tends to be unrelated to recessions (Howell et al. 2020). Business cycles can also be interpreted as catalysts of capitalistic growth, with boom periods allowing innovation and bust periods encouraging restructuring (Tan and Mathews 2010; Schumpeter 2010). Herein, success in bust periods is mainly attributed to entrepreneurs running innovative start-ups, as opposed to other types of SMEs (Kariv 2022).

Start-ups react particularly strongly to negative demand shocks, immediately affecting long-term profitability of start-ups. As the start-up matures, the effect becomes even more pronounced compared to competitors founded during positive demand shocks. The cost bases of start-ups tend to increase significantly, while the top-line is not growing conjunctly. This limits the company's growth potential and drives down the profitability, indicating that high-growth firms tend to be created during boom-cycles (Sedláček and Sterk 2017). As start-ups also heavily benefit from human capital and contribute to

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economic growth as generators of workplaces (Puri and Zarutskie 2012; Haltiwanger, Jarmin, and Miranda 2013), access to educated staff is a crucial economic success factor for start-ups (Skawińska and Zalewski 2020).

All in all, the economic determinants of start-up success and growth can be aggregated as macroeconomic growth and the access and costs of financial and human capital (Audretsch and Acs 1994). The VC sector is highly cyclical and depends on the general economic climate (Prohorovs 2020). The economic uncertainty increases the difficulty for VCs to fundraise, so they do not invest in start-ups as much as they did before the crisis, leading to a scarcity of start-up funding (Colombo et al. 2010). In boom cycles, VCs are willing to invest in riskier ventures

which eventually may exhibit higher failure rates, implying that VCs have more capital available to allocate to start-ups and are willing to take more risks than in periods of the downturn (Nanda and Rhodes-Kropf 2013).

### **3.3 VC Investments during Past Crises**

To understand how the current economic downturn affects the investment activity of VCs in Europe, lessons may be drawn from prior research on how VC investments were affected by economic crises. Therefore, mainly sources that investigated the influence of the dot-com crash in 2000 and the financial crisis in 2008 on the US VC market will be used due to the lack of studies of the European VC market. This research will then be used to identify research themes for R.Q 1.1 to investigate the current development of the European VC market and to have comparative values to the current findings.

#### Background on the Crises

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The dot-com crash in 2000 resulted from the expansion of the tech bubble in previous years, where Nasdaq had seen a massive increase, primarily fueled by the successful funding of any company with "dot com" in its name (Hill 2018). During that time, revenue and earnings forecasts often showed exponential growth for start-ups that barely existed on paper, ignoring traditional valuation metrics (Hill 2018). This "grow at any cost and claim as much market, without any revenue" approach came to be known as the "Get Big Fast" mentality. One of the major causes of this was that VCs and other investors were pouring money into overvalued tech and internet start-ups (Kirsch and Goldfarb 2006). However, as some investors started to take profits by selling shares, this rapidly grew into a panic, resulting in the Nasdaq Composite Index losing 78% of its value from March 2000 to October 2002 and only 48% of dot-com companies surviving through 2004 (Hill 2018; E. Sohl 2003).

On the other hand, the global financial crisis (2008-2012) started as a housing bubble due to banks and other mortgage providers giving out high-risk loans. Eventually, it destroyed the whole global economy and resulted in a recession that lasted from 2008 to 2012 (Hill 2018). Singh (2022) states in this regard, "when the bubble burst, financial institutions were left holding trillions of near-worthless investments in subprime mortgages". The Global Financial crisis has been widely considered the worst recession since the Great Depression of the 1930s. The bankruptcy of Lehman Brothers in September became, for many, a symbol of the devastation caused by the global financial crisis, costing many people their jobs, life savings, and homes (Singh 2022; Hill 2018).

### Influence on the VC Investment Activity

When looking at the VC market after the dot-com crash, according to the research of Hochberg et al. (2018) and Aragon et al. (2019), not only did investments reduce in general, moreover, while VCs continued to finance start-ups in their portfolio, they were withdrawing from

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otherwise promising projects. Sohl (2003) supports this by reporting that the US quarterly investments by VC funds decreased from USD 26.2B in Q1, 2000, to USD 6.5B in Q3 2001, representing a “400% drop in investment dollars”. In addition, VC returns fell to -20% in 2001, marking the first 12-month negative return for the VC industry. Many VC firms also used their funds to bridge portfolio companies rather than invest in new start-ups (Sohl 2003).

When looking at the global financial crisis, similar effects can be seen according to studies by Block and Sandner (2009), Block et al. (2012), Conti et al. (2019), and Pianeselli (2019). For example, the quantitative study of Block and Sandner (2009), which investigates the effect of the 2008 financial crisis on the US VC market, finds that the total volume of funds decreased. Specifically, they explore that the average amount of funds raised per funding round decreased by 20%, though this effect could only be found in later funding rounds. Block and Sandner (2009) argue that this is due to companies in later financing rounds needing more capital to survive and being more affected by the weak IPO market. On the other hand, companies that sought initial funding could delay their plan to raise funding until the capital markets stabilized; hence, their average funding amount was not affected. They imply that “the financial crisis can lead to a severe funding gap in financing technological development and innovation.”

Another study from Block et al. (2012) a few years later discovers a decrease in the number of deals. The study shows the same findings for the funding amount while also investigating whether the crisis differed across industries and countries. They learn that the decrease in funding rounds per month occurred within all industries, especially noticeable within specific industries, namely Biotechnology, Internet, and Medical/Health Care (J. Block, de Vries, and Sandner 2012). Conti et al. (2019), contradict these findings and discover that aggregate-funded start-ups received no less financing during the financial crisis, but VCs allocated relatively more resources to start-ups operating in the VC's core sectors. Precisely, they observe that core start-

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ups received 9.4% more funds than non-core start-ups, while the number of funds raised by non-core start-ups declined by approximately 8% (Conti et al. 2019).

According to Pianeselli (2019), investment in early-stage start-ups and the number of deals increased or did not significantly change during the financial crisis, whereas there was clear evidence of a severe 20% to 30% funding gap for start-ups in later stages. He explains this by the start-ups wanting to postpone their IPOs to avoid lower valuation during a crisis. Another finding of his is, that VCs increased follow-on investments during that time, especially for Seed and early-stage companies (Pianeselli 2019).

When looking at the studies of both the dot-com crash and the global financial crisis, somewhat different opinions can be found regarding the number of investments and the investment volume, though there is a tendency for financial recessions to harm both indicators. Therefore, one of the research themes aims to gain insights into whether and how the current economic downturn influences investments in terms of the number and volume of early-stage VC deals. Another evident trend is that the impact of both crises mentioned above is smaller for early-stage start-ups than for later-stage start-ups. Some researchers found that there is no change in early-stage investments. Based on this, the second research theme investigates this theory in the current market environment. The third research theme is based on the findings of Sohl (2003), Aragon et al. (2019) and Hochberg et al. (2018), and explores whether VCs increasingly invest in start-ups within their own portfolio during uncertainty in the economy. Lastly, a study by Block et al. (2012) suggests that even though a decline in investment is evident across all industries due to the global financial crisis, for specific industries, this decline is more significant than for others. The fourth research theme investigates whether similar developments can be identified.

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### 3.4 VCs and Start-ups during current Crises

The crises of the past years, mentioned in Chapter 1.1, impacted the VC and start-up market in different ways. What is known so far regarding these developments will be summarized in the following two chapters.

#### 3.4.1 Influence on VC Investments

Economic fluctuations impact VC investments severely (Gompers et al., 2008; Gompers & Lerner, 2004). Covid-19 caused an unprecedented crisis, as it not only encompassed financial and political repercussions across most industries but also entangled those with societal ramifications (IMF 2022a), outweighing the shock caused by 2008's recession (S. R. Baker et al. 2020). In the aftermath, shortly after the first Covid-19 incidents became public, stock markets collapsed globally. Governments worldwide took strong measures to contain damages to people's health, which impacted businesses twofold: First, businesses were forced to shut down temporarily, operate at low capacity, and, if possible, work from home. At the same time, access to additional financial sources was constraint. Second, demand was severely affected by social distancing and quarantines all over the world (Fairlie & Fossen, 2022; IMF, 2022a).

#### The beginning of the Covid-19 crisis

Following a period of solid growth of VC investments in Europe prior to the unfolding of the crisis (Crunchbase 2019), a clear investment drop can be perceived with the onset of Covid-19 (Brown, Rocha, and Cowling 2020). To quantify the impacts of the events in the year 2020, Bellavitis et al. (2022) analyze a set of ca. 40,000 funding rounds in 130 countries. The authors conclude that investments with a higher degree of uncertainty experienced a

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decrease in funding quantity, such as early-stage investments, investments in industries that were more heavily affected by Covid-19, cross-border investments, and investments that were not subscribed to by a club of investors (Bellavitis, Fisch, and McNaughton 2022). This finding is confirmed by Howell et al. (2020), constituting that VC funding dropped dramatically following the Covid-19 shock in the first half of 2020, being especially pronounced in the early-stages due to information asymmetries, with later-stage investments being less affected.

The last time such a low deal activity for early-stage deals occurred was at the beginning of 2013 (Brown et al. 2020). Bellavitis et al. (2022) and Brown et al. (2020) find that later-stage deals were proportionally less affected by the Covid-19 crisis than early-stage deals. Overall, investments were impacted by Covid-19, idiosyncratic to the expectations of how investments move in a crisis: the volume and quantity of investments decreased, and early-stage investments, such as Seed and Pre-Seed rounds, were more affected than later-stage investments (Howell et al. 2020; Srivastava and Gopalakrishnan 2022).

When referring to Chapter 3.6, VC activities often rely on in-person interactions, such as internal meetings among the VC's investment team and meetings with the founders of the potential investee firm where the founders present their business (Clark 2008). Covid-19 measures caused a disruption in how VCs handled their work (Bellavitis, Fisch, and McNaughton 2022; Brown, Rocha, and Cowling 2020) and intensified investment uncertainty (S. R. Baker et al. 2020). This is further confirmed by the fact that trust in the founders is a critical factor in the investment decision (Cherry 2015). While in-person meetings form trust, this possibility was interrupted during the Covid-19 crisis, leading to

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difficulties for VCs in deciding on companies to invest in due to the digital setting (Müller and Wöhler 2022).

Furthermore, Srivastava & Gopalakrishnan (2022) find that investors adjusted their investment targets according to the situation created by Covid-19. When start-ups could adjust to the new work-from-home requirements, they were more likely to receive VC funding. At the same time, they found that investors became more risk averse, preferring domestic investments in firms that adjusted to the new Covid-19 requirements.

### 2021 and beyond

The outcome of the Covid-19 crisis could lead to more robust VC market activity. Lower valuations and decreased negotiating power of founders might generate favorable investment possibilities, contributing to a recovery of VC investment activity (Howell et al. 2020). With the growth of the VC ecosystem overall since the last decade, more investors compete to fund promising ventures (Bonini and Capizzi 2019; Brown, Rocha, and Cowling 2020).

The prediction by Howell et al. (2020) materializes in the year following the onset of the COVID-19 crisis. The investment volume rose almost 160% year-over-year (YoY) at the end of 2021, reaching a total investment amount of USD 116B for European start-ups, with both the number and size of funding rounds increasing (Teare 2022a). Therefore, 2021 is considered a record year for VC investments with unprecedented levels of funding volume (Chapman, 2022a; KPMG, 2022; Teare, 2022b) and funding speed (Thorne 2022). TrueBridge Capital Partners (2022) identify the increase in deal-making velocity as a fundamental explanation for this rise in deals: Funds can be deployed faster through the

new adjustments that were driven by Covid-19. The hardship of adjusting to mainly working digitally in 2020 became the norm in 2021. The work-from-home amenities allowed investors to run due diligence processes and investments virtually. Additionally, the deal velocity is fueled by the large amount of dry powder raised by VCs and the fierce competition to invest in the best start-ups (KPMG 2022; State of European Tech 2021). Only in 2021, there was a rise in European's unicorn count, with 84 newly created unicorns and soaring valuations (Teare 2022b).

Since the beginning of the economic downturn in 2022, VC financing fell approximately 50% YoY in the Q3 of 2022 (Teare 2022c). Even though ample capital of over USD 20B was raised by European VCs in Q1 – Q3 of 2022, leading to large amounts of dry powder, as can be retrieved in Figure 4, investors remain cautious about how to deploy their funds (Dealroom and Silicon Valley Bank 2022). Overall, the VC landscape in 2022 is marked by caution and uncertainty (Dealroom and Silicon Valley Bank 2022).

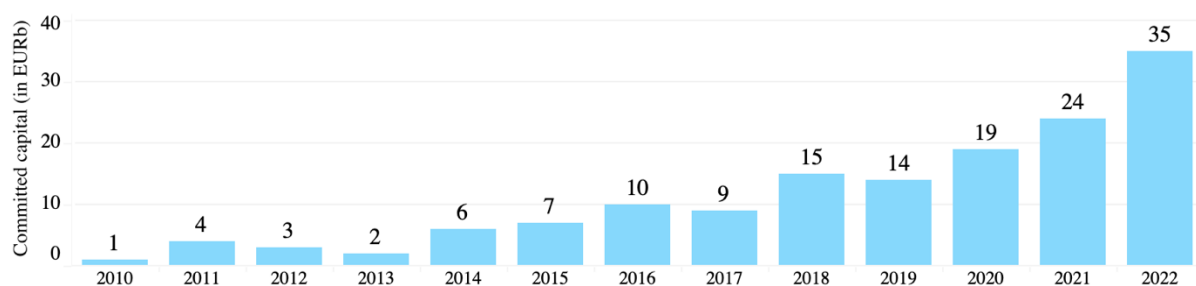


Figure 4: Annual capital raised by VC firms in Europe

Source: Own Illustration based on Dealroom, & Silicon Valley Bank. (2022). European VC Pulse Check H1 2022.

## 4 Methodology

After outlining the conceptual background in the relevant fields for this thesis, the following chapter outlines the adopted research approach for answering the above-stated research questions and provides details on data selection, collection, and analysis.

### 4.1 Research Design and Method

Two primary approaches can be applied when research is conducted, an inductive or deductive research approach. Both refer to the relation between theory and conducted research during the study (Bell and Bryman 2007). Inductive reasoning aims to develop a theory, whereas deductive reasoning aims to test an existing theory (Streefkerk 2019).

This thesis follows a deductive-inductive research approach to investigate specific research categories within the four underlying research questions and explain causal relationships between the findings. Therefore, the main research categories were defined first, and consequently, the coded interviews were for some topics inductively structured into subcategories (Mayring 2014). Moreover, as the study also includes quantitative data, the deductive approach offers the possibility to measure the investigated concepts. Besides, the research method of this thesis follows a methodical triangulation theory approach. According to Creswell (1994), the theory was first introduced by Denzin (1970) to advocate using multiple methods to approach the same research question. Methodical triangulation mainly combines qualitative and quantitative research methods in one study and is also often referred to as a "Mixed method" (Johnson et al. 2007).

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There are several reasons why methodical triangulation can be beneficial in research. Firstly, a researcher is thereby able to cross-check evidence by having several data sources, which enhances credibility (Greene et al. 2016). In addition, it helps to get a complete understanding of a research question and enhances validity. The latter effect is based on each method having its strengths and weaknesses. Complementary methods can account for these limitations. Especially when wanting to capture a real-world phenomenon, it can be helpful to use methodical triangulation. (Bhandari 2022). As the influence of the economic downturn on the European investment market is a real-world phenomenon, this method is being used to answer the research question to gather a more comprehensive understanding of the situation.

In this approach, the first step was to review the existing literature and research of each of the four research questions. Through this step, the research gaps studied were identified and developed based on these findings. In the second part, the research was formalized by establishing the conceptual framework and structured vision of the investigated factors. In the next stage, the research topics are followed by an explanatory research strategy that aims to establish causal relationships between the studied fields (M. Saunders et al. 2009).

## **4.2 Data Sources**

Primary data was collected and analyzed using Crunchbase data and interviews to answer the research questions. As an explanatory research type targets analyzing the causal relationships between the own collected data, this approach was chosen (M. Saunders et al. 2009).

### **4.2.1 Crunchbase Data Selection and Collection**

To collect data on investment activity within the EU during the last years, data from the website Crunchbase was used. Crunchbase is “the leading provider of private company prospecting and research solutions” with over 70 million users. The platform offers global investment and funding information, as well as information on companies, funding members, etc. Thereby, they

rely on data from over 4000 investment firms that submit monthly portfolio updates, which ensures the most up-to-date information (Crunchbase 2021). Especially within entrepreneurship research, “these instantaneous real-time data sources are becoming increasingly prevalent”, according to Schwab and Zhang (2018).

Search filters set on Crunchbase		Variables retrieved from Crunchbase
Variable	Filter	
Investor Type	Venture Capital	Organization Name
Last Funding Type	Pre-Seed - Series A	Last Funding Type (Series A etc.)
Headquarters Location	European Union	Headquarters Location
Last Funding Date	01.01.2019 - 30.11.2022	Organization Industry
Operating Status	Active	Money Raised / Funding Amount (in USD)
IPO Status	Private	Announced Date
		Lead Investor

*Table 1: Crunchbase data description*  
Source: Own illustration

To answer the first and second research questions, a data sample of VC investments into early-stage EU Start-ups that received financing from VCs between January 1, 2019, and November 2022, is being used (Table 1). This time frame allows for analyzing the investment activity during the crises of the last years and the first effects of the current economic downturn. Other Crunchbase search filters used are funding rounds between Pre-Seed and Series A (early-stage), an “Active” operating status, and a “private” IPO status, to ensure that the start-up is still operating and not yet publicly listed. After filtering out 19 outliers, the retrieved data set comprises 6191 start-up investments.

#### 4.2.2 Interviews Data Selection and Collection

In addition to the quantitative analysis of Crunchbase data, expert interviews were conducted to complement the first two research questions and answer the last two. The qualitative method was chosen because the consequences and changes of the current downturn are still unfolding, and there are few concrete data points available yet (Kohlbacher 2006). Moreover, semi-

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structured interviews are a highly efficient method to get a holistic overview of the market and to open further research fields (Eisenhardt and Graebner 2007). During the interviews, a semi-structured approach was chosen, whereby a guideline and questions are already predefined, but the order can be arranged flexibly, and individual answers of the interviewee can be considered. The flexible approach allows for gathering as much information as possible. To reduce biased data, multiple experts at different career levels and countries were interviewed (Harrell and Bradley 2009). The questions were formulated openly so that specific topics could be explored more in-depth if appropriate. The aim of the interviews was to gain insights and answers to the overarching research questions, as well as the underlying research questions concerning each research venue formulated in Chapter 1.2. Based on this, the VC interviews were always conducted with all researchers present and structured into three parts in which insights could be gained for each of the research questions that target VCs.

Based on initial research of VCs operating within Europe and focusing primarily on early-stage investments in various sectors, the first list of potential interview partners was drawn up. First, the potential interview partners were identified through the professional social media platform LinkedIn and from a personal network composed of business connections and personal contacts. Subsequently, all contact details were documented in a spreadsheet. Keywords used during the search included “Venture Capital” or a specific name and position descriptions such as “investor”, “director”, or “partner”. Following, the selected contacts were contacted directly via LinkedIn messages and e-mail. Overall, more than 60 potential VC interview partners were contacted, resulting in 11 interviews. In total, VCs were interviewed for a total length of 438:52 minutes. The interviews consist of investors at different levels who invest in Europe in different areas, such as digital, high-tech, and deep-tech. Due to significant geographical distances, the interviews were all conducted online via video conference. All interviews were electronically recorded and transcribed with the interviewees' consent to minimize the loss of information.

The table below shows the number of interviewees, their anonymized abbreviation, which will be used in the following, the position within the VC of the interviewee, the investment thesis of the VC, the years of experience the VC has, divided into three categories, and the number of investments made by the VC, also divided into categories.

<b>Name.</b>	<b>Position</b>	<b>Investment thesis</b>	<b>Experience</b>	<b># of Investments</b>
V01	Investor	VC focused on tech and digital at all stages globally	10+	250-500
V02	Investor	Social VC focused on early-stages of the DACH-region	10+	<50
V03	Investor	VC focused on early-stage in Europe	5-10	50-250
V04	Investor	VC focused on technology at all stages in Europe	10+	250-500
V05	Investor	VC focused on technology across all stages in Europe	10+	50-250
V06	Investor	VC focused on investing at all stages globally	10+	250-500
V07	Director	VC fund investing across all sectors at early-stages	10+	500+
V08	Partner	VC focused on early-stage globally	<5	<50
V09	Partner	VC fund focusing on deep tech Seed stage investments.	<5	<50
V10	Investor	VC focused on tech, life sciences, and tourism at Seed stage in Europe	10+	250-500
V11	Investor	Specialized VC focused on all stages in Europe	<5	<50

*Table 2: Anonymized table of VC interview partners*

*Source: Own illustration*

At the same time, interviews with early-stage start-ups were conducted to receive a whole picture of the market. A list of potential interview partners was established based on the portfolio firms of the interviewed VCs, as well as start-ups that pitched to these VCs. Similar to the approach used to source VC interviewees, start-ups were sourced either from the personal network or via LinkedIn using the same spreadsheet structure as for VCs, mainly targeting the founders, investor relationship managers and CFOs of the start-ups as potential interview partners. Particularly, the interviewed individuals held fundraising positions in the last two years and actively sought or secured funding between 2020 and 2022. Subsequently, the researched start-ups were contacted using LinkedIn messages or e-mails directed at the aforementioned personnel, conducting six interviews via video

conference and one interview via e-mail. Overall, 76 start-ups were contacted, which finally yielded seven interviews lasting a total of 102 minutes. The interviews were recorded and transcribed after obtaining the agreement of the interviewee. An overview of all start-up interviewees, including the region, fundraising status, stage, sector, and the interviewee's position, is illustrated in Table 2.

Name	Region	Last funding	Stage	Sector	Position
S01	Germany	€3M	Seed	Software	Founder
S02	Portugal	Undisclosed	Growth	Software	Founder
S03	Germany	Fundraising	Pre-Seed	Energy	Founder
S04	Germany	Undisclosed	Pre-Seed	Software	Founder
S05	Germany	Fundraising	Seed	SaaS	Founder
S06	Germany	Undisclosed	Seed	Aviation	Founder
S07	Germany	Undisclosed	Pre-Seed	Logistics	Founder

Table 3: Anonymized table of start-up interview partners  
Source: Own illustration

### 4.3 Data Analysis

The retrieved data was further analyzed and interpreted qualitatively and quantitatively using *Excel*, *Tableau*, and the thematic analysis approach for qualitative interviews.

#### 4.3.1 Quantitative Analysis

The quantitative analysis exclusively addresses numerical data obtained from Crunchbase, which is a frequent analysis method in entrepreneurial research (Dalle, den Besten, and Menoni 2017). Herein, the data is analyzed using descriptive statistics to derive findings that can later be compared to the findings of the interviews. The descriptive analysis was conducted using the data visualization tool *Tableau*, in which the datasets described in the previous section were analyzed, resulting in descriptive statistics. The summary statistics can be reviewed Table 4. The main tools for analyzing the Crunchbase data were Tableau

table functions, including sum, frequency, average, percentage differences, and median, using mainly the variables *Money Raised (in USD)*, *Total Funding Amount (in USD)* and *Pre-Money Valuation (in USD)*. Hence, the outcomes of the analysis were used besides the interview data to draw a conclusion on the current market environment.

<b>Number of unique companies in data set</b>					<b>4911</b>
<b>Total number of investments in set</b>					<b>6191</b>
Pre-Seed					1413
Seed					3308
Series A					1470
	<b>Min</b>	<b>Max</b>	<b>Average</b>	<b>Median</b>	<b>Standard deviation</b>
<b>Money Raised (in USD)</b>	10 000	240 000 000	3 567 149	1 675 834	10 254 807
<b>Total Funding Amount (in USD)</b>	11 027	3 823 018 477	17 147 141	2 628 402	92 990 610
<b>Pre-Money Valuation Currency (in USD)</b>	100 000	545 000 000	12 538 476	3 195 388	39 873 745

Table 4: Summary statistics  
Source: Own Illustration

### 4.3.2 Qualitative Analysis

All interviews were recorded and coded to analyze the data retrieved from interviews. The questions asked in the interviews aimed to answer the research questions of each of the four subordinated research questions, which are subsequently used to answer the main research question. Based on the answers of the interview participants, the information for each interview is clustered in themes and then analyzed to derive inferences (Sheppard, 2020). These clusters, also called codes or themes, pertain to the thematic analysis approach of interviews (Maguire and Delahunt 2017).

Using a deductive-inductive coding approach (Atchison and Palys 2013), which is established by predefining topics of interest constituted by the research questions, relevant

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themes are identified within the interviewee's answers. This process is followed by focused coding (Sheppard, 2020), where the most relevant and related themes are selected and, if applicable, merged. Once this process is completed, the answers to the research questions for each chapter are formulated directly using the information from the interviews. Finally, the resulting outcome is interpreted, combining it with prior literature research and, if applicable, with quantitative findings, yielding the final conclusion of each research segment.

## 5 Findings

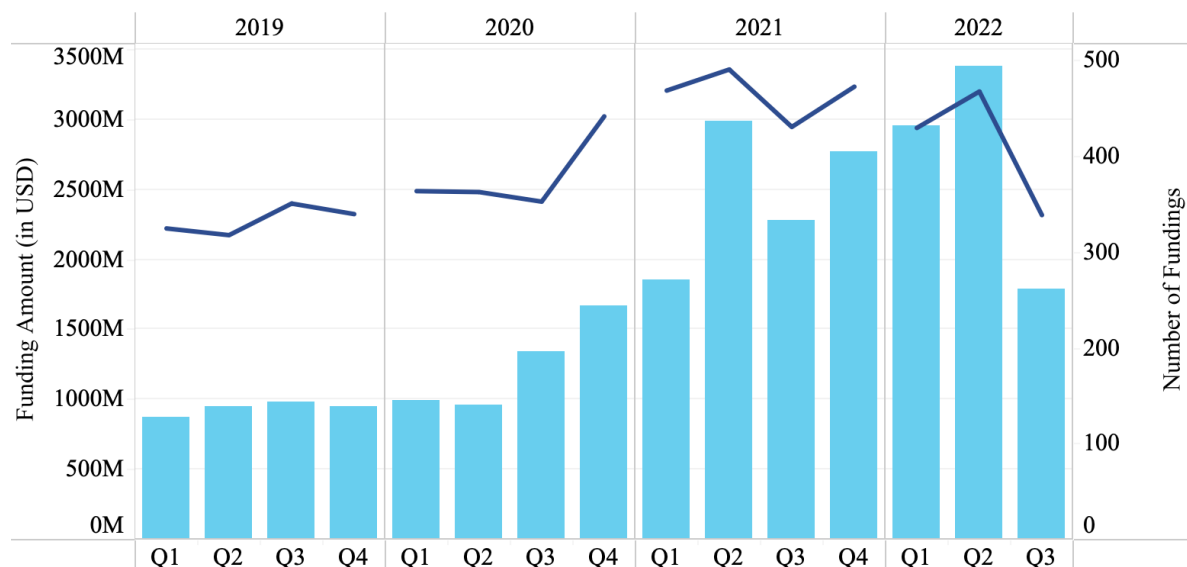
As of November 2022, no academic literature has analyzed the impact of the 2022 downturn on the start-up and VC ecosystem. Emerging from the backdrop of a global health crisis, with a following bull market in 2021, the market dynamics have shifted drastically in 2022. Therefore, basing an analysis on a mixed method by combining quantitative findings on start-up and investment data and qualitative findings retrieved from interviews, the findings on the four RQs will be shown. Hence, the current VC ecosystem is examined, starting with the overall VC investment activity, followed by the impact on start-ups, value-adding activities, and selection criteria of VC investors. To structure the interview results, the answers were coded. An overview of the corresponding codes for each RQ can be found in Appendix

### 5.1 Investment Activity of VCs

Based on the research topics defined in the literature review in Chapter 3.3, the following chapter will present the findings of RQ 1.1 through combining the results of the quantitative data with the expert interviews.

Effect of the current economic downturn on the number and volume of early-stage VC deals:

To understand the effect of the current economic downturn on the number and volume of early-stage VC deals, the quantitative data from Crunchbase will be looked at first. Therefore, Figure 5 illustrates the development of the number of VC deals (dark blue line) and the funding amount in USD (light blue bar chart) that start-ups received from Q1 2019 until Q3 2022. It can be observed that both the number of deals and the funding amount first dropped when the Covid-19 pandemic started from Q1 to Q2 2020. However, starting from Q3 2020, both indicators, primarily the funding amount, increased rapidly until Q2 2022. In Q3 2022, however, this changed, and the number of deals decreased by 28% from 468 deals in Q2 to 339 deals in Q3, while the funding amount decreased by 47% from ~USD 3.400M to ~USD 1.800M. As the funding amount decreased more than the number of deals, the average funding amount declined, specifically by 27% from ~ USD 7,2M in Q2 to ~USD 5,2M in Q3, after having inclined the quarters before.



*Figure 5: Development of number of deals and funding amount 2019-2022*

Source: Own Illustration from Tableau based on Crunchbase data

The interviewees also observed this development. Looking at the beginning of 2020, when the Covid-19 pandemic started, the investment market slowed down due to much economic uncertainty (V01). V02 supports this by stating: "We were less active in the first half of 2020 due to a lot of uncertainty and the declining market. [...] Instead, we focused on supporting existing ventures." However, this changed quickly, as "Covid jumpstarted innovation, e.g., in terms of digital transformation," resulting in a "boom in VC activity" (V08). V08 explains further that this trend was fueled by "cheap money because of the low-interest rates" and ended in "record-breaking investment activity during 2021". Several other interviewees support this, outlining the high amount of deal flow and rising valuations (V02, V04). Another phenomenon that V01 describes was that "in early 2021, one suddenly saw tourists such as hedge funds entering earlier stages, prominent examples being Tiger Global or Coatue". V01 also characterizes the investment activity in 2021 as "crazy" and "unprecedented" and raises the hypothesis that 2021 will be considered the most active year for the next couple of years in Venture Capital.

End of last year, one started to see early signs of economic and financial downturns, which became much more evident with the start of the Russo-Ukrainian war, the global supply chain issue, and rising interest rates. To understand how this influenced the private markets, more precisely the number of deals and the deal volume, it is essential to take a closer look at the interviewees' statements in this context. When looking at their statements, different opinions can be observed. V05, for example, responds that while they did not see a slowdown in investment activity in their VC, they saw a significant slowdown across the industry, especially UK funds that have barely made any deals in the past eight months. V07 supports this by stating: "We have barely seen any changes in the early-stage regarding the number of deals as well as deal volume." Nevertheless, V07, as well as V02, acknowledge that they are "more cautious"

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and "more selective" with their investments because market dynamics and price developments are essential. Due to this, it is getting harder for start-ups to raise money, mainly because no one knows how long the current economic downturn will last, according to V02.

On the other hand, V01 says that their investment activity changed due to decreasing valuations and exit scenarios. In fact, for several interviewees, "Valuations are starting to be more decent", as "2021 valuations were too high in the early-stage" and "now the market is getting adjusted" (V04, V08, V011). Another finding of V08 is that the number of hot rounds declined, meaning that VCs now have more time to evaluate opportunities. At the same time, he mentions that "great start-ups will always have VC interest, but you tend to have a little bit more time and negotiation power on the VC side in the early stages at the moment." A phenomenon that is also described by V08 is "Seed-Extensions" or "Bridge-Rounds". He experiences that start-ups that raised around a year to one and a half years ago are getting back to them to raise money because their boards recommend they have enough capital for at least 24 months to see how the public market is developing. Regarding the number of deals and deal volume, V04 indicates that they slowed down their investment activity. More precisely, the interviewee estimates, "We do 30-40% fewer deals right now" while always being open for "opportunistic bets". V11 supports this by stating that "the market is definitely slowing down" and that start-ups are having more difficulties raising money and predicts that this market slowdown will further increase within the following months.

#### Effect of the Economic Downturn across Funding Stages

The second area to be investigated is whether there were differences in the impact of the economic downturn on different funding stages. For this purpose, the quantitative Crunchbase data will be looked at first.

Figure 6 shows the development of the total funding amount in the last years, differentiated by the three funding types "Pre-Seed", "Seed", and "Series A". The economic downturn had the

most drastic impact in terms of funding amount on Series A, which is also plausible because the ticket sizes are larger in later stages. For this reason, it is also helpful to look at the development in terms of percentage change to be able to draw more significant conclusions. Pre-seed investments declined by 26% from Q2 to Q3 2022, from ~USD 99M to ~USD 73M. During the same time, Seed investments decreased by 31% from ~USD 970M to ~USD 670M, while Series A investments experienced a drop of 55% from ~USD 2.300M to ~USD 1.000M. When looking at the funding development of the three investment types in the early-stage, one can already observe the trend that the later the stage, the more significant the impact of the economic downturn.

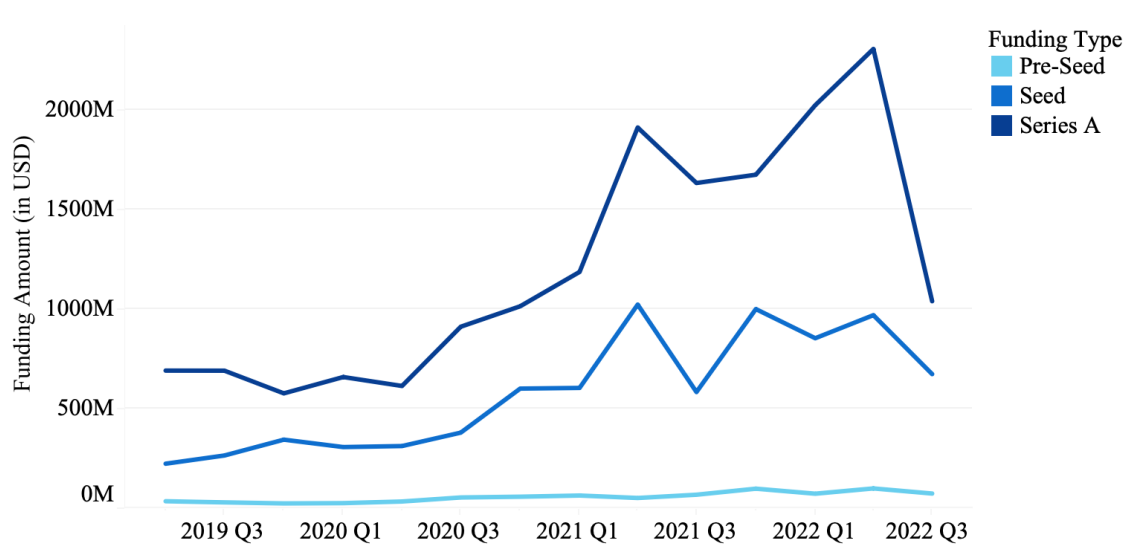


Figure 6: Development of funding amount across different stages 2019-2022  
 Source: Own Illustration from Tableau based on Crunchbase data

The interview partners also confirmed this finding (V01, V03, V05, V06, V08). In doing so, most interviewers did not distinguish within the early-stage but expanded the focus from the early-stage to growth and later-stage. For instance, V03 outlines: "The current economic downturn was certainly way earlier visible on growth than on Seed stage, and that derived from what happened on the stock market." V05 supports this by mentioning that while they did not see any slowdown in the early-stage, they did within their growth fund that looks at Series B+ opportunities. This can be attributed to the exit environment being vastly different from last year and that generally less capital is available; hence, the chances of raising an up round are

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less. The same phenomenon was described by V06, pointing out that this year was exceptionally slow regarding their growth investments compared to the last years. This could also be seen through their portfolio companies, which postponed their funding to next year. A reason for growth investments being more affected by the economic downturn is, according to V06 also, that there is much more data available from the public markets.

In comparison, according to V01, Seed rounds still seem very active in terms of the number of rounds being done and deal flow because up-market investors that usually invest in A & B stages are now shifting to invest in seed-stage start-ups to mitigate macroeconomic risks. Lastly, V08 reinforces the statements of the other interviewers by expressing seeing a drop in the number of deals, but mainly in the amount of money poured into later-stage investments, starting at Series B. He argues that the valuations of early-stage investments generally take longer to adjust because the holding period of these investments is much longer. Another finding related to this is that V08 observed that far fewer mega-rounds took place in 2022 (investments of more than USD 100M in a single round). In this regard, he adds: "Usually you use recurring revenue multiples to define the prices of the rounds, and those are pegged to public markets, which have a bigger effect on later stages".

#### Effect of the Current Economic Crisis on Re-Investments in Portfolio Companies

To gain insights about whether early-stage VCs increasingly focus on backing start-ups within their portfolio during an economic downturn, solely qualitative data from the expert interviews will be utilized, as no data points regarding follow-up investments could be retrieved from Crunchbase.

Looking at the interviews, V03 states that since the economic downturn first hit in April, they put a stronger emphasis on backing their portfolio. Further, they explain that every company below 14 months of runway fundraised earlier than planned, and when they had the chance to back them, they did so. V05 contradicts this by saying that while they are supporting their

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portfolio companies, there was no change in trend, meaning that their intended ratio between initial and follow-up investment (40% initial, 60% follow-up) stayed the same. Supported was this approach by V06, who explains that even though it happened in one or two instances, doubling down on their portfolio is not their strategy. Instead, they sit together with their portfolio companies and reflect on their capital needs. When they were planning the fundraising this year, they advised them to postpone it to next year and instead cut down their burn rate. V06 mentions: "Maybe we were lucky with our portfolio companies, that most of them still had sufficient capital needs [...] maybe this will also look different next years when some companies cannot wait any longer to fundraise". V04, on the other hand, describes that they experience a lot of their portfolio companies "needing more financing from their existing cap table", resulting in "a lot of internal rounds". At the same time, V04 clarifies that they are strict to send a start-up "on the ramp" if they do not see performance improvements. Hence, they cannot say yet whether they will cross their 50% benchmark from initial investments versus follow-up investments in the long term. V02 adds that while they do not focus more on backing start-ups within their portfolio, they know of other VCs trying to secure liquidity for every portfolio company for the next couple of years.

#### Effect of the Past Years' Macroeconomic Developments on Investment Themes

To explore how investment activity has changed in recent years, it is also essential to consider whether there have been any changes in investment themes, i.e., whether certain investments are becoming more or less popular due to their specific industry. Therefore, the quantitative data from Crunchbase will first be analyzed before the findings are complemented with those from the interviews. Figure 7 exhibits the development of the funding amount of the top 5 industries or investment trends during the last four years: Artificial Intelligence (AI), Biotechnology, E-Commerce, Financial Services, and Health Care.

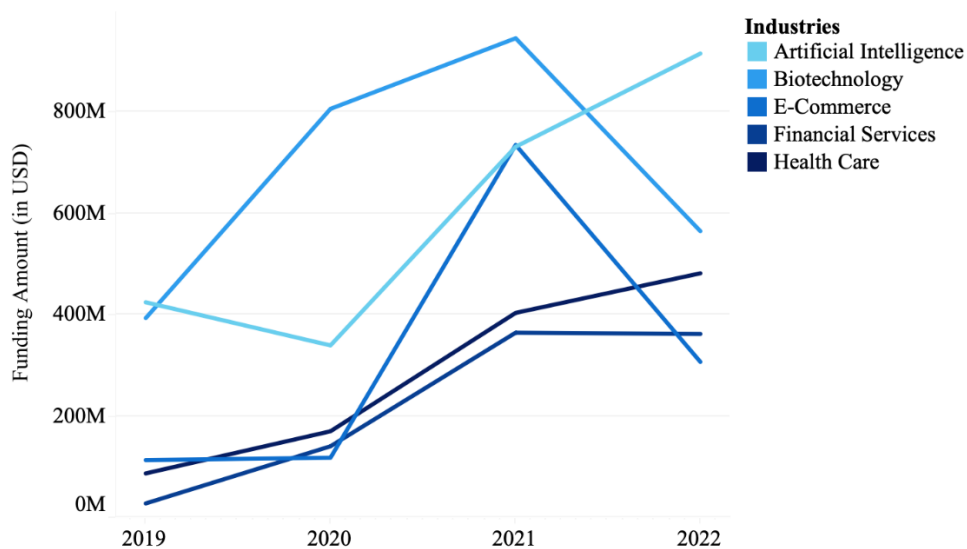


Figure 7: Development of top 5 industries based on funding amount 2019-2022

Source: Own Illustration from Tableau based on Crunchbase data

The chart indicates that industries and, thus, investment themes have developed differently in recent years. Particularly apparent is that investments in Biotechnology and E-commerce increased significantly from 2019 until 2021, due to Covid-19 before experiencing a sharp decline after 2021. This suggests that the economic downturn had a significantly negative impact on these two investment themes. To illustrate, the investment volume in Biotechnology start-ups initially increased from USD 390M in 2019 to USD 945M in 2021 before declining again to USD 564M last year. In contrast, the other three investment themes increased on average from 2019 to 2022. Of note are investments in AI and Health Care, whose investment volumes today add up to USD 915M and USD 482M, respectively. Since investments in AI, Health Care, and Financial Services did not decline or at most stagnated since last year, only a minor influence of the economic downturn on these three industries can be assumed.

When comparing this with the results of the interviews, it is evident that partly similar but partly different trends can be identified. One area not listed in the investment themes of Crunchbase but identified as a trend by several interviewees is investments in enterprise / B2B SaaS start-ups (V01, V04, V08, V09, V10).

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Thereby, several reasons are named. V01, for example, mentions that B2B SaaS experienced a boost through Covid, while V08 characterizes B2B SaaS start-ups as "more recession proof" in general. Further V04 states: "We focus a lot more on the leaner, the less capital intensive and most scalable models [...] often B2B software business models can grow significantly with a team of just 20 to 50 people and do not need 100 people on their payroll".

A trend indicated in the Crunchbase data, and also mentioned by several interviewees, is the decline of investments in D2C start-ups. For instance, V06 explains that they will not make D2C investments now, at a time when consumers are decreasing their consumption. V04 even states: "The time of quick commerce is over", implying that this development is not just temporary. V03 supports this by mentioning that they stopped investments into E-commerce and instead focused on software enabling E-commerce. Though the E-commerce industry from Crunchbase does not only include D2C investments, a significant reason for the decline of E-commerce can be attributed to D2C. Another finding from the interviews is that VCs are currently more cautious with investments in FinTechs. V06 explains this by the "massively decreasing FinTech multiples" during the past months, partly due to the current interest rate environment (V05). This finding can be partly backed by the Crunchbase data, as Financial Services experienced a stagnation compared to last year.

One industry that, according to several interviewees, is experiencing an acceleration in funding volume due to the gas crisis is the energy sector. Hence, start-ups in CleanTech are gaining importance, especially in terms of energy generation and storage, but mobility as well, as seen by the increasing number of investors in these topics (V02, V07, V09, V11). According to V11, every technology that can improve these areas will receive sufficient funding as their urgency will continue to increase. In addition, topics like Green Tech and Sustainability or ESG are becoming more critical, especially since these trends will also be relevant in the long term (V02, V03, V11). V03, for example, discloses that they see more co-investments in start-ups with an

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ESG focus. Moreover, as visible in the Crunchbase data, Healthcare investment is a trend that is gaining more and more importance among VCs. For V02, it is "one of the areas with the greatest investment potential" and is "catalyzing the optimism in the venture industry". V09 endorses these comments and adds that healthcare is also a recession-proof industry, which will become increasingly relevant in the long term. Yet another trend that, according to V01 and V08, is accelerated through Covid is the future of work or remote work. However, they state that this is a perfect example of an overhyped trend, as most start-ups that evolved around that topic are not performing well today. Contradicting the Crunchbase data, which suggests a decline in investments in BioTech start-ups, V09 considers BioTech (next to CleanTech) a fascinating area with significant future possibilities. He argues that researchers constantly discover more about the human body and that software and AI play an increasingly important role in this area, thus driving progress.

Finally, several of the interviewed VCs express that they increasingly invest in start-ups that enable or disrupt established industries (V02, V03, V06, V07). Especially in times of crisis, it is critical to evaluate whether or how much start-ups are influenced by the macro environment. V02, for example, mentions, "our approach is to look for ventures that solve societal problems and will not disappear in a short time [...] that way we secure that we do not invest in short term trends". Hence, more recession-proof models, such as CleanTech, BioTech, and Healthcare, however also more lean business models, such as B2B SaaS, are preferred by VCs, especially during an economic downturn.

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## 6 Discussion

The discussion aims to investigate and evaluate the effect of 2022's economic downturn on the EU VC market. In Chapter 6.1 the interview and Crunchbase data results are critically discussed by focusing on the four underlying research questions, directed at answering the overall research question. Thereby the discussion is not only based on this thesis's findings but also on the theoretical findings and current literature discussed in previous chapters. After critically reflecting on the overall results in Chapter 6.2, theoretical implications are provided. In the last two sub-chapters, implications for practice, as well as several limitations and future research, are discussed.

### 6.1 Summary of main findings

In the summary of the main findings, RQ1.1, RQ1.2, RQ1.3, and RQ1.4 will be answered before focusing on the overarching research question in the "Critical Reflection" chapter.

#### 6.1.1 Investment Activity of VCs

Firstly, to answer RQ1.1 on how the current economic downturn influences the investment activity of early-stage VCs in Europe, the quantitative data and interview results are critically discussed by focusing on the four defined research themes. The discussion is based on this thesis's findings and complemented by literature.

When looking at the first research theme, different opinions can be recognized on the effect of the current economic downturn on the number and volume of early-stage VC deals. Looking solely at the quantitative data, the latest Crunchbase data from Q3 clearly shows a decline, although it should be noted that this is still well above the 2019 level. However, the conclusion is not so clear when it comes to the interviews. While on one side, a few of the interview partners invested less, others have shown little or no difference in their investment behavior.

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Nevertheless, there is a tendency toward the current economic downturn affecting the number and volume of early-stage VC deals. This effect was also described in research on the dot-com crash as well as the financial crisis by Hochberg et al. (2018), Aragon et al. (2019), Block and Sandner (2009), Sohl (2003) and Block et al. (2012). When having a closer look at the average ticket size, funding data shows a decline of 24% from Q2 to Q3 this year, during the economic downturn. Block and Sandner had similar findings in 2009 when investigating the effect of the global financial crisis. They observed that the average amount of funds raised per funding round decreased by 20% (2009). The only contradicting findings were found by Conti et al. (2019) and Pianeselli (2019).

On the other hand, something where the interviewees (V01, V03, V05, V06, V08), as well as the researchers, are aligned is that the influence of the current downturn depends heavily on the investment stage. To conclude, a more substantial influence of the economic downturn can already be seen in the different investment types of the early-stage, meaning that it had a more significant influence on Series A than on Pre-Seed or Seed investments. Further, the interviewees added that this correlation is even more significant in later stages, such as the growth stage. The reason for this is that the later the funding stage of the start-up, the higher the dependence on the private market. Hence, as private markets are more volatile to economic changes, later stages will mostly be stronger affected by economic downturns.

Looking at the third studied theme, VCs increasingly cover their start-ups during an economic downturn, affirmed by V02, V03, and V04, as well as by Pianeselli (2019). Due to the uncertainty in the market, VCs want to ensure that their portfolio companies have enough runway to survive the economic downturn.

Lastly, when looking at what effect the past years' macroeconomic developments had on investment themes, different industry trends can be identified, such as AI, Health Care, Biotechnology, CleanTech, and B2B SaaS. To conclude, VCs increasingly consider start-ups

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that disrupt established industries or solve societal problems with preferably lean business models.

## 6.2 Critical Reflection

Presently, society and the economy worldwide are facing severe challenges triggered by various crises, such as the Covid-19 pandemic, the Russo-Ukrainian war, supply chain difficulties, and interest rates. Since the VC market and the economy are interrelated and influence each other, this thesis aims to analyze the impact of the economic downturn on the current VC market in Europe, complemented by the perspective of start-ups. Therefore, several expert interviews with European VCs and start-ups were conducted.

The findings show slight changes in the early-stage investment activity of European VCs, as the total funding amount and the number of fundings are decreasing, since Q3 this year. According to expert interviews, this is due to the fact that the uncertainty in the market is also leading to VCs becoming more cautious. In addition, the uncertainty is causing VCs to focus primarily on their portfolio companies and support them with further funding, as they realize that it is becoming increasingly difficult to obtain follow-up funding and want to avoid down-valuations of their portfolio. This uncertainty is also confirmed in the selection criteria that VCs use to select start-ups for their next investment. Due to the economic downturn, VCs are particularly conscious about the financial health of start-ups, as VCs do not expect obtaining further investments in the coming months to become easier. Therefore, VCs want start-ups to have low burn rates to increase their runway to get by with the currently available capital for as long as possible. The increased caution by investors in financial stability is also confirmed by the fact that some VCs are hoping for profitability earlier than usual and want to see a clear path towards it. As a result, VCs expect lean and resilient business models to have higher chances of succeeding during the economic downturn. Therefore, they currently prefer those proven types of investments. Accordingly, the investment trends of VCs have shifted towards

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sectors that show appropriate characteristics. At the same time B2B investments are getting more attractive, as consumer spending is decreasing.

These findings are in line with the perception of start-ups, who state that it is more difficult to obtain funding from VCs since the economic downturn. To avoid a down-valuation through a needed follow-up investment during the current economic situation, start-ups have tried to raise larger rounds and aim to extend their runway to about 24 months. This increase in the average funding amount could be achieved until Q2 2022, however, it is now becoming increasingly complex since the economic downturn started to become apparent in the investment data in Q3 2022. VCs are aware that this effect will also influence their portfolio companies and the associated need for additional investor support in various areas. Therefore, VCs advise their portfolio companies on how costs can be saved, the burn rate reduced, and the runway lengthened with the available money without completely sacrificing growth. Furthermore, VCs are leveraging their existing networks to secure follow-up investments for their portfolio companies or to switch to alternative financing options such as family offices, which may be less affected by market uncertainty. However, cost-cutting and the numerous layoffs associated with the economic downturn have also eased the labor market.

### **6.3 Theoretical Implications**

The purpose of the thesis is to examine the VC market developments regarding current events in the economy in Europe. The general investment activities were analyzed, and the pre- and post-investment behavior of start-ups and VCs have been evaluated in a deeper analysis. Existing literature focuses on past crises, such as the dot-com crash or the financial crisis (Chapter 3.3). However, there is no academic evidence yet for the current economic downturn. Moreover, the impact of crises has been studied mainly in the US (Chapter 3.3), but not on the European VC market. As Europe's VC scene has grown considerably in size, by expanding the literature to European, new research areas can be revealed.

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The investment activity is composed of each investment decision which is made based on various criteria. The literature provides an overview of relevant criteria but does not consider the impact of macroeconomic developments (Chapter 3.5). The thesis shows that macroeconomic conditions impact how VCs evaluate new ventures and assess their success. By expanding the current literature, new ventures could draw appropriate implications according to the current macroeconomic situation when seeking funds.

Similar reasoning can be drawn for non-financial value-adds. When assessing how VCs support start-ups post-investment, it is helpful to expand the literature by external factors. When making decisions and implementing measures, start-ups oftentimes draw on their investors for operational and strategic support. These decisions and measures are taken within certain framework conditions, which depend on external factors. Non-financial value-adds during times when the economy is flourishing can differ from times when the economy is facing downturns. By expanding the research on these aspects, VCs can adapt appropriately.

#### **6.4 Practical Implications**

The following section discusses implications for practice for early-stage VCs as well as start-ups on how to best manage phases of economic downturn. The implications result from the thesis' findings of the current VC and start-up market development in Europe and are structured into pre- and post-investment implications.

Looking at the pre-investment phase, VCs should become more cautious with their investments in deteriorating market conditions. Even if the influence of private markets on early-stage start-ups is relatively low, they still influence the start-ups' potential for success. For this reason, VCs should emphasize their selection criteria to increase the chances of a higher return rate. Particular attention should be paid to financial and business selection criteria, such as burn rate and business model resilience. At the same time, VCs should consider that cost-cutting implicates lower growth rates in most cases and that it is essential to specify their priorities in

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this regard. Consequently, it becomes more difficult for start-ups to raise money during an economic downturn. To obtain investments, two implications can be derived for start-ups. Firstly, as VCs are increasingly focusing on the burn rate of start-ups, they should reduce costs to obtain more funding. This could, for example, be done by cutting unnecessary overhead costs or laying off employees, which goes along with the finding that lean business models are becoming more favored among investors. In addition to a lean business model, investors are also paying increasing attention to the resilience of the business model. Thus, another important implication for start-ups is highlighting their resilience during investor pitches.

Next, when focusing on the post-investment phase, VCs should increasingly provide support to their portfolio companies during an economic downturn. Thereby, support is especially important in terms of helping portfolio companies to extend their runway, which they can mainly do via reinvesting, strategic advice, and providing a network. Hence, another implication for VCs is that they should focus on building their network, as solid and diversified networks provide crucial support for portfolio companies in crises. Moreover, it can help to build a long-term differentiating factor to other VCs. At the same time, start-ups should leverage this network more to facilitate raising follow-up rounds, finding the right human capital, as well as for strategic and product support, as this will be a determining success factor.

## **6.5 Limitations and Future Research**

As with any research, there are some limitations to this study and directions for future research to complement the research on the impact of the downturn on VC activity in Europe. These limitations can be categorized into research design related limitations and thematic limitations. One research design related limitation lies in the quantitative area of this research, as only Crunchbase is used as a database in this study. Although the data was confirmed through qualitative interviews, data gaps may occur due to delays in data publication from the last weeks or months. In addition, the data was filtered by certain aspects. Thus, it should be considered

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that some data points were excluded from this research. In addition, Crunchbase data sometimes contain inaccurate information and assign individual start-ups to several industry sectors. Therefore, it is a limitation of the work, as it could slightly distort the picture of the results, and future research should also consult other databases to enrich the findings. Furthermore, next to the Crunchbase data analyzed in this study, regression analysis with quantitative macroeconomic data to investigate the exact correlation and interaction of economic factors and the VC market leaves room for future research.

In addition, start-up funding rounds are often subject to a non-disclosure agreement. Such an agreement makes it difficult to get detailed and truthful answers from start-ups in interviews. Furthermore, start-ups differ, for example, in terms of stage, sector, experience and many other factors. To be able to draw even more specific conclusions, future research should be carried out with a more significant number of start-ups and be narrowed down by specific characteristics of the start-ups. Moreover, another research design related limitation is that Chapter 3.5 focuses only on a finite set of selection criteria in the area of management, business and financial selection criteria, as the selection criteria are analyzed qualitatively within the framework of this research. However, there are suggestions in the literature that there exist other selection criteria VCs take into account when selecting start-ups (Muzyka, Birley, and Leleux 1996). Future research leaves room to survey European VCs to shed light on a broader set of selection criteria and analyze them quantitatively. In addition, the interviewed experts were, in most cases, very limited in terms of time, which is why almost all interviews were limited to 30 minutes. Although it was ensured that there were sufficient answers for each question, not every question could be asked in all interviews due to time constraints.

Besides the research design related limitations, this study has some thematic limitations due to the limited scope of this work. Chapter 3.6 focuses exclusively on the main non-financial value adds, namely network, strategic advice and human capital support. However, the current

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literature indicates that there exist other aspects in which VCs add non-financial value (Proksch et al. 2017). An exciting direction for future research is whether those factors are also affected by the current economic development. Furthermore, this study analyzes exclusively early-stage investments and start-ups. Nevertheless, the literature and expert interviews indicate that the current economic downturn has a different impact on early-stage compared to later-stage (Block and Sandner 2009; Pianeselli 2019). V05 and S01 for example, say they feel only little affected by the economic downturn and justify this with the early investment phase. Therefore, later-stage investments and start-ups should be further investigated in future research and compared to early-stage investments.

In addition, most of the interviewed VCs had been in the market for many years, indicating more experience with market fluctuations. Therefore, another exciting area to analyze would be whether younger VCs with less experience would be impacted more by the economic downturn. Moreover, both, the literature and the expert interviews, indicate that the European VC market is dependent on the US VC market, while also experiencing significant differences within Europe in individual VC markets, such as tax incentives in Portugal. Hence, a detailed analysis of geographical dependencies and differences is also an important area for future research. Moreover, the first quantitative changes, for example, in ticket size and volume, could only first be analyzed with the beginning of Q3, 2022. Therefore, researching the downturn over the entire period, offers other areas for future research.

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## 7 Conclusion

Europe has been facing various crises for some time now. The outbreak of the pandemic in 2020 and the Russo-Ukrainian war since February 2022 upset the economic conditions. The resulting supply chain problems, energy crisis, and political sanctions are reflected in rising prices. The related rise in the inflation rate further led to increased interest rates. The business environment in Europe has become much more complicated since then, which is again reflected in GDP, an important indicator of how well the economy is developing. Since the entrepreneurial system is influenced by economic events, the aim of this thesis was to determine how the European VC market reacts to the crises. The focus was thereby on early-stage start-ups from the VC side as well as the start-up side. Based on the perceptions of VCs and start-ups, it can be concluded that the VC market is influenced by the economic downturn, but to a moderate extent. So far, no disruption is apparent, but a negative change is already emerging. How the trend will continue, however, remains to be seen. The study showed that whereas last year early-stage ventures were given more decision-making freedom due to the maturity level of the business concepts, investors overall have become more cautious. Accordingly, many start-ups try to come closer to the expectations of the investors. Overall, compared to the previous year, in 2022, start-ups will have to perform significantly more competitively, as many can no longer withstand the current selection criteria of VCs. This development means that new ventures must now operate more effectively. Thus, many start-ups seek support in the partnerships of the currently invested VCs due to their expertise and network.

Especially last year, the valuations in the VC market have risen sharply across the board. Some start-ups that now address investors must expect that their company value will be corrected downwards. However, this does not apply to all start-ups. Consequently, the market is fragmented into a group that must adapt to the requirements and a much smaller group that already has all the requirements. Therefore, it is now crystallizing who the "top" start-ups are.

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The competition among VCs for start-ups, in general, was high last year. As this currently applies to a minor part, VCs are increasingly trying to position themselves. Many still need their investors' capital to be deployed, causing them to focus stronger on the more promising start-ups. As the crisis is still unfolding at the moment this research was conducted, and thus far, only preliminary conclusions can be drawn. From the results of the study, it appears that the impact on early-stage ventures will remain low. The current macroeconomic circumstances are unlikely to last and thus will create affirmative conditions for the VC market again. Nevertheless, the current developments and crises from the past show that start-ups with a secure and viable business concept will always receive sufficient funding.

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## Appendix

### Appendix 1: List of Abbreviations

AI	Artificial Intelligence
ARD	American Research and Development
B2B	Business-to-Business
ECB	European Central Bank
GDP	Gross Domestic Product
GP	General Partner
IMF	International Monetary Fund
IPO	Initial Public Offering
IVC	Independent Venture Capital
KPI	Key Performance Indicator
LP	Limited Partner
ROI	Return on Investment
SaaS	Software-as-a-Service
VC	Venture Capital
YoY	Year-over-year

## **Appendix 4: Interview Request via E-Mail for VCs**

Dear [Name],

We are a team of 4 Nova students currently working on their master's thesis. As we are all passionate about the start-up scene, we are exploring how the current crisis is influencing investment activity in Europe. Thereby, we want to investigate how the investment activity and the market is affected, as well as whether the value proposition of investors and the needs of start-ups are changing. Hence, we want to consider both the investors' view (of VCs and Business Angels) as well as the investees' view of start-ups through conducting interviews with the respective parties.

This is where your help would be highly appreciated, as we are still looking for interview partners. It would be great if you would have time for a 30-minute call within the next two weeks.

Feel free to choose a time slot that suits you under the following link:

<https://calendly.com/novaworkgroup>

We would proceed by sending you our interview questions in advance and providing you with our findings afterwards, as soon as our thesis is completed.

We are looking forward to your answer!

Thank you, and kind regards,

Annika, Anna, Marie and Nora

## Appendix 5: Interview Request via E-Mail for start-ups

Dear [Name],

We are a team of four students at Nova SBE, writing a master thesis about the impact of current crises from a VC and start-up perspective in Europe. Thereby, we want to investigate how the investment activity and the market is affected, as well as whether the value proposition of investors and the needs of start-ups are changing. Hence, we want to consider both the investors' view (of VCs and Business Angels) as well as the investees' view of start-ups through conducting interviews with the respective parties. This is why we would highly appreciate hearing your first-hand insights on the topic.

If we caught your interest, feel free to choose a 30-minute time slot for an interview under the following link: <https://calendly.com/marie-hubulova/nova-work-project-interview> or drop us a message if you have any questions. We would proceed by sending you our interview questions in advance and providing you with our findings afterwards, as soon as our thesis is completed.

We would be very pleased about your support to analyze the current market and thank you very much for your help!

Kind regards,

Annika, Anna, Marie and Nora

## Appendix 6: Interview Request via LinkedIn for VCs

### What is going on in the European VC market?

Dear [Name],

We are a team of four students at Nova SBE in Lisbon in our last semester, currently working on our thesis. As we are all passionate about start-ups and the venture capital scene, we are writing our thesis about how the current crises impact the venture capital activity in Europe, focusing on both the investor and the start-up view.

To do so, we would highly appreciate getting a short time slot with you to get your insights on the topic! Feel free to choose a time slot that suits you under the following link: <https://calendly.com/novaworkgroup> or drop us a message if you have any questions.

As soon as we have agreed on a date, we will be happy to send you our questions in advance. The interview should take about 30 minutes. We would be super happy if we have caught your interest and appreciate your support to analyze the current effects in a market-true way.

Thank you very much for your help!

Kind regards,

Annika, Anna, Marie and Nora

## Appendix 7: Interview Request via LinkedIn for start-ups

### What is going on in the European start-up market?

Dear [Name],

We are a team of four students at Nova SBE, writing a master thesis about the impact of the current crises from a start-up perspective, focusing on investment activities and the changing needs of start-ups. This is why we would highly appreciate hearing your first-hand insights on the topic.

If we caught your interest, feel free to choose a 30-minutes time slot for an interview under the following link: <https://calendly.com/marie-hubulova/nova-work-project-interview> or drop me a message if you have any questions. I will be happy to send you our questions in advance. Your name and firm will be anonymized for the thesis and we offer to send you a copy of it if you are interested.

We would be very pleased about your support to analyze the current market and thank you very much for your help!

Kind regards,

Annika, Anna, Marie and Nora

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## Appendix 8: Interview Questions for VCs

### I. Investment activity

1. How did the crises and economic changes during the last years affect the **investment activity** of your VC? (Change of tickets size, investment stage etc.)
2. Did your **investment focus** change during the last years, in terms of more/less investments in start-ups that are closer to your core business and more/less investments in start-ups that already in your portfolio?
3. Which **investment theme trends** influenced your investment decisions during the last years? (e.g. Remote Working Technology, Green Technology, Health Technology etc.)

### II. Screening criteria for investment decision (financial, business, management team)

4. Regarding **financial screening criteria**,
  - How do you value the **return on investment** and the underlying aspects (e.g., profitability, growth) since the uncertainty about economic development has been rising?
  - Has the **capital need** in terms of **burn-rate** become more important?
  - Has the **exit opportunity** in terms of **time-to-exit** become a higher priority?
5. Regarding the **business screening criteria**,
  - Is it more important to have a **proven product need** than to have just a good business idea?
  - Do you evaluate the **market** the business is aiming to operate in differently? (besides normal factors, e.g., size, growth)?
  - Do you think the **competitive surroundings** change because of the challenging environment (COVID, supply chain problems, war, inflation, etc.)?
  - Do you pay more attention to the **resilience of the business model** since economic growth is expected to decrease?
6. Regarding the **management team screening criteria**,
  - Is the **education** of the management team more crucial during the economic downturn?
  - Is the **experience** more important since the economy has been facing difficulties?
  - Do you pay more attention to certain **soft skills** that might help during an economic downturn (e.g., motivation, recognize risk)?

### III. Non-financial value adds

7. What are the most important **non-financial values** VCs adding to start-ups? Did you notice a change/shift of importance? (Network, human capital, reputation, etc.)
8. Is the crisis making cooperation closer? Are there more interactions, more control over how the portfolio company comes through the crisis, or do you work exclusively on a basis of trust?
9. In case of **NO change**:
  - Why do you think your current non-financial values are robust and help start-ups get to current crises?
  - Are there political or economic aspects/discussions/developments that you are observing that might cause a change of the needs of start-ups?
10. In case of **change**:
  - How are the new non-financial values implemented?
  - Did the start-ups clearly communicate the new needs or did you make the changes in value adds on your own initiative?
  - Was it necessary to build up new expertise/partnerships to do so? Could you use your experience?

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## Appendix 9: Interview Questions for Start-ups

### IV. Financial perspective of venture capital activity

1. How difficult was it to **find investors** compared to how it was before 2022?
2. What is your **impression how VCs reacted** to the different events occurring in 2022?
3. How many VCs/investors were interested to invest? Did you notice any **difference in replies** at different stages of political/economic developments (e.g. any short-term reactions after interest rate hikes / inflation spikes?)
4. Did you notice whether VC switched from **active to passive sourcing**?
5. Do you have the impression that **sector/product preferences** of VCs have shifted? If so, how?

### V. Business perspective of value-adding activities

1. Do you recall how often you have **communicated** with your investors before and during the different crises and economic changes?
2. If yes, how did the **communication change**? (More frequent, more inquisitive?)
3. If no, did you **wish to talk more** to them or were you waiting for your investors to check in?
4. Which **supported did you expect** during the crises and its political and economic consequences?
5. If you expected support, was it aligned with the **support** you received?
6. Did you notice a change in the investor's requests regarding **information**, e.g., a stronger importance on financials?
7. Which **impact did the change in behavior** / additional support have on your business?
8. How did you **adjust your own strategy** in the face of turbulences?

### VI. Investor choice

1. How did the crises impact your own decision matrix when **choosing an investor**?
2. What do you think is the most important **criteria VCs currently look for** in their investments?
3. How did these criteria impact your **own fundraising strategy**?

## Appendix 10: Interview Overview VCs

<b>Respon-Interview dent Date</b>	<b>Interview Duration</b>	<b>Contact Method</b>	<b>Interview Method</b>	<b>Recording allowance</b>	<b>Anonymization desired</b>	
V01	10.10.2022	39'10	LinkedIn	Teams	Yes	Yes
V02	14.10.2022	35'46	LinkedIn	Teams	Yes	Yes
V03	24.10.2022	31'22	E-Mail	Zoom	Yes	Yes
V04	27.10.2022	25'44	E-Mail	Teams	Yes	Yes
V05	27.10.2022	27'50	LinkedIn	Teams	Yes	Yes
V06	04.11.2022	29'38	E-Mail	Teams	Yes	Yes
V07	11.11.2022	33'14	LinkedIn	Teams	Yes	Yes
V08	18.11.2022	34'15	E-Mail	Teams	Yes	Yes
V09	22.11.2022	32'33	LinkedIn	Teams	Yes	Yes
V10	24.11.2022	1'14'35	E-Mail	Teams	Yes	Yes
V11	30.11.2022	45'45	E-Mail	Teams	Yes	Yes

## Appendix 11: Interview Overview Start-ups

<b>Respon- Interview dent Date</b>	<b>Interview Duration</b>	<b>Contact Method</b>	<b>Interview Method</b>	<b>Recording allowance</b>	<b>Anonymization desired</b>	
S01	27.10.2022	14'28	LinkedIn	Teams	Yes	Yes
S02	09.11.2022	-	E-Mail	E-Mail	-	Yes
S03	22.11.2022	10'51	E-Mail	Teams	Yes	Yes
S04	24.11.2022	17'42	E-Mail	Teams	Yes	Yes
S05	07.12.2022	15'41	LinkedIn	Teams	Yes	Yes
S06	09.12.2022	26'00	E-Mail	Teams	Yes	Yes
S07	11.12.2022	19'17	LinkedIn	Teams	Yes	Yes

## Appendix 12: Interview Coding VC

Nr.	Category	Definition	Examples
<b>A. Impact on investment activity</b>			
A.1	Number and volume of deals	All statements that provide information about whether and how the number and volume of deals changed due to the economic downturn.	“Because of the economic downturn we are getting more careful with investments, and it is getting harder to raise money.” (V02); “Overall the investment activity did change [...] last year the investment pace was crazy until Q1 this year and then it significantly slowed down.” (V04); “As early-stage investments are typically taking a lot longer to correct [...] they are only starting to be affected this last quarter.” (V08); “We haven’t really seen a slowdown.” (V05), “We have barely seen any change in early-stage regarding investment activity.” (V07); “Seed rounds are still very active.” (V01)
A.2	Impact of investment stage	All statements that provide information about the difference in the influence of the economic downturn in investment stages.	“The impact of the economic downturn differs depending in the stage you invest in.” (V05); “One cannot generalize the impact of the market slowdown as there is a difference between seed and growth stage funds. For us in early-stage, investment activity has not really slowed down this year, however for our growth fund it slowed down a lot.” (V06)
A.3	Re-investments in portfolio companies	All statements that provide information about re-investments in portfolio companies since the economic downturn.	“During the summer our focus was to support our portfolio companies by backing them or helping with fundraising.” (V03); “We are experiencing more internal rounds.” (V04); “The ratio between initial and follow-up investments did not change [...] it is still 40% initial and 60% follow-up investment.” (V05); “Doubling down on our portfolio is not our strategy.” (V06)
<b>A.4 Investment themes</b>			
A.4.1	B2B SAAS	All statements that provide information about a change in the investment theme “B2B SAAS” since the economic downturn	„B2B SAAS was boosted through Covid” (V01); “We focus a lot more on the leaner, the less capital intensive and most scalable models [...] often B2B software business models can grow significantly with a team of just 20 to 50 people and do not need 100 people on their payroll” (V04)
A.4.2	D2C	All statements that provide information about a change in the investment theme “D2C” since the economic downturn	“The time of quick commerce is over” (V03); “A core change of us is that we are not doing e-commerce investments anymore.” (V08)

A.4.3	FinTech	All statements that provide information about a change in the investment theme “FinTech” since the economic downturn	“FinTech is slowing down specifically, given the current interest rate environment.” (V05); “As multiples of FinTechs have decreased massively, we have invested less.” (V06)
A.4.4	Healthcare	All statements that provide information about a change in the investment theme “Healthcare” since the economic downturn	“Healthcare is one of the areas with the greatest investment potential.” (V02); “HealthTech catalyzes the optimism in the venture industry.” (V01)
A.4.5	ESG / CleanTech	All statements that provide information about a change in the investment theme “ESG / CleanTech” since the economic downturn	„The industry around sustainability is experiencing much more investments [...] every kind of technology that can improve the energy sector, will continue to have investor interest.” (V11)
A.4.6	Disruptive business ideas	All statements that provide information about increasingly focusing on disruptive business ideas since the economic downturn	„What we are doing is backing startups that are enabling or disrupting established industries.” (V03); “We are searching for start-ups that disrupt the current status quo [...] is that something that someone would buy also in the current macro environment.” (V07)
<b>B Impact on start-ups from a financial and non-financial perspective</b>			
B.1	Investor selectiveness	All statements that provide information about how selective investors became, indicating changes in investment quantity	“You're either very good target or not target at all. It's really hard to get money at all” (S01); “They are way way more selective on what to invest.” (S02); “The VCs will listen to you and will look like he's super interested. But at the end of the day, 90% of them won't invest right now into your companies.” (S05)
B.2	Selection criteria	All statements that provide information about concrete examples of what start-ups perceive VCs look for	“VCs get more passive within business models that require a lot of capital” (S03); “In 2021 the worst thing you could pitch was getting profitable too early. By early 2022, there was like a 360-degree switch and VCs said you have to be profitable very early actually.” (S05); “We had really had to make cuts on our budgets to be able to convince the investors” (S07)
B.3	Valuation	All statements that provide information about the valuation of start-ups	“Our valuation was quite high, even bigger than we were anticipating in in the beginning” (S01); “I heard that the valuation was a bit lower than it could have been a year before” (S04); “Maybe right now it is point where it's falling apart because the valuations are way too big for the most companies.” (S07)
B.4	Runway	All statements that provide information about	“We increased the funding size we were targeting twice to increase our runway” (S04);

		how start-ups were managing their cash needs	“We definitely were cutting costs to a level where it it's not pleasant” (S06); “We planned with 15 new employees next year and now we're hiring 6.” (S07)
B.5	Downturn prioritization	All statements that provide information about their own and their investor’s current risk perception	“It felt like we were slowly drifting into this crisis, right. The recession started slowly and clearly” (S01); “With the beginning of the Ukrainian war, I noticed that a lot of investors got very scared in European market.” (S05); “No one really realized what's happening until 2022, I expected something might happen sometime, but not that it would happen in 2022.” (S06)
B.6	VC involvement	All statements that provide information about how VCs interacted with start-ups in terms of the crisis	“We didn't speak over the recession. We speak about strategic decisions about product, market fit” (S01); “I think for us it was just still the same topics [we discussed with our VCs]. It was kind of crisis unrelated” (S03); “They will ask you for KPI's and they also will have a very strict view on those KPI's. Besides that, not a lot changed in the communication” (S05); “We wish of our investors to help us get new fresh money” (S07)
<b>C. Impact on screening criteria of VCs</b>			
<b>C.1 Financial screening criteria</b>			
C.1.1	Return on investment	All statements that provide information about how VCs value profitability during the economic downturn	“Profitability at seed stage is always tough. But there needs to be more of a clear path towards profitability, whereas last year it was more important that there is growth. (V01); “One general topic is unit of economics, so profit on a per customer basis so ist a yes there is more of a focus.” (V04)
C.1.2	Capital needs	All statements that provide information about how VCs value the cash start-ups need to develop during the economic downturn	“[...] extra generated revenues per month divided by what you are burning per month. Because that gives you an idea of how efficiently a company is utilizing the capital you give them. That is definitely one that I have seen people speak about more, and look at more. We have also been looking more at that” (V01); “Burn rate absolutely. Capital efficiency is super important to us these days. That is always important, but we look at this even closer.” (V06)
C.1.3	Exit opportunity	All statements that provide information about how VCs value the time until an exit opportunity due to the economic downturn	“Not really worried, because at the end of the day we see this as a cycle, and we are now at the bottom, but better days will come for sure.” (V07);

C.2 Business screening criteria			
C.2.1	Product	All statements that provide information about how VCs value proof of product during the economic downturn	“In 2021 there were huge funding rounds and evaluations on just an idea or a pitch deck.” (V03); “Maybe time to product-market fit gets more important but this is very individual, up to every investor, where you feel comfortable to invest in.” (V06)
C.2.2	Market	All statements that provide information about how VCs value the market environment during the economic downturn	“The market is of course one of the main factors, how big it can get, how much pull factor it has and the trajectory in the near and mid-term future.” (V07); “Then you have some considerations about the crisis, that you think for example that Europe is going to recover slower vs US or more money in Asia or not. But macroeconomic aspects are not as important.” (V08)
C.2.3	Competitive surrounding	All statements that provide information about how VCs value the competitive advantage during the economic downturn	“Personally, we do not think that the competitive surrounding did not change too much, because the market will always be fierce.” (V07); “There might be increased competition because companies need to make sales to stay financially stable during the next months. And competition is also about, who is more effective and can survive with capital in the pockets.” (V09)
C.2.4	Resilience of business model	All statements that provide information about how VCs value the resilience of the business model regarding the economic cycle during the economic downturn	“On a more macro level it is more a qualitative assessment whether this is a business model that can persist a financial or economic crisis like a recession.” (V01); “Rising commodity prices, rising energy prices, delay in the supply chain is putting a lot of effects only on top line, revenues, but also on the margin side.” (V03)
C.3 Management team screening criteria			
C.3.1	Education	All statements that provide information about how VCs value educational background during the economic downturn	“We look at the universities they attended, whether it is an institution that fosters innovation.” (V08); “A lot of entrepreneurs come from high brand universities, e.g., Stanford, Harvard, but we don’t give it a lot of weight” (V08)
C.3.2	Experience	All statements that provide information about how VCs value the experience during the economic downturn	“It is a lot more relevant if they have been doing similar things in startups in the past, e.g., when they are launching a gaming start-up and they have been strong in gaming” (V08); “Of course, there are some teams where members just come from university, e.g. Facebook, but it is much harder for them.” (V11)

C.3.3	Soft Skills	All statements that provide information about how VCs value soft skills during the economic downturn	"One that is always relevant in any economic situation but even more relevant in downturns is resilience, never give up and really go after it. So, attached is the laser focus. Sometimes you have founders that are all over the place because they are really creative. So, in downturns, you have to privilege the [management teams] that are really focus and not try to do everything and just do the two or three things they should be doing." (V08); "One thing that is really hard to evaluate and I know that there are players in the market that try to investigate on that is how founders will react psychologically to this environment." (V10)
<b>D. Impact on post-investment behavior of VCs</b>			
D.1	Network	All statements that provide information about how a VC's network can be leveraged for portfolio companies during an economic downturn	"Follow on fundraising is a major concern, as nobody knows how the market will look like in 12 month. Having been in the market for so long and having built a huge network makes it easier and helps to remove uncertainty from founders." (V01); "Attracting new funds is a main challenge. VCs can use their network to approach other investors and make intros." (V02); "We can leverage our network to build a good investment funnel [...]. Follow on financing is even harder now than before [...]. We even need alternative pools of investments, e.g. family offices." (V04)
D.2	Strategic advice	All statements that provide information about how strategic advice from VCs can support portfolio companies during an economic downturn	"Over summer, we sat down with them and discussed how to reduce burn rate, cut costs [...]. Before, the startup approached the investors [...], but the table have turned." (V03); "In the recession, we try to help more how to manage cash in the bank. [...] We help them to be more efficient about how to spend money and fuel growth. [...] Markets tend to overreact. It is very hard to reactivate full growth." (V08)
D.3	Human capital	All statements that provide information about how a VC supports your portfolio company in terms of human capital during an economic downturn	"Hiring is relative good nowadays, due to layoffs which make it easier right now. However, it is still an important value add." (V1); "We build an own team, which is supporting only portfolio companies with human ressources related topics [...]. Access to people is most crucial, but it gotten a bit easier, because there are a lot layoffs due to the crisis." (V4)
D.4	Value proposition	All statements that provide information about	"Founders had a situation in the past, where they could just choose their VCs. Therefore,

		<p>how the importance of a VC's value proposition changes during an economic downturn</p>	<p>the start-ups approached the VCs: Tell me what your value add is! This is changing now." (V02); "Deals will become incredibly competitive in the future. If you do not have a specific edge as a VC you will not be able to access the best deals [...]." (V07)</p>
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## Glossary

Limited partner	Limited partners make investments into a partnership in exchange for shares. LPs have only restricted voting power and are not involved in the day-to-day business.
General partner	A VC fund's management. GPs evaluate start-ups and make investment decisions. They are mainly compensated by carried interest and management fees.
Private equity	Private equity refers to investment partnerships that purchase and then manage companies before reselling them.
Committed capital	The money that an investor commits to a VC fund that is not allocated to a startup yet, often referred to as dry powder.
Carried interest	Compensation of GPs that they receive upon the successful exit of an investment.
Downturn	When the stock, commodities, and real estate markets drop, productivity either slows or falls, and GDP growth stagnates or contracts.
Runway	The runway indicates how long a start-up can operate before it runs out of money

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Recession	Recession means a sharp, deep, and prolonged decline in economic activity.
Down round	During a down round, a private company sells additional shares at a price below the price sold in the preceding funding round, often leading to dilution.
Post-money valuation	Post-money valuation refers to the value of a company after receiving debt capital and/or capital injections.
Pre-money valuation	Valuation of a company before receiving venture capital.
Ticket size	The amount of money an individual VC invests in a startup.
Black Swan event	Unpredictable occurrence with serious repercussions.