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The impact of COVID-19 on Venture Capital Investment Strategies

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Abstract

The recent COVID-19 pandemic severely impacted the economic environment in which the venture capital (VC) industry operates. Through a survey conducted on more than 500 venture capitalists, this study aims to understand the impact of the COVID-19 crisis on venture capitalists' investment strategies and practices. Although several changes have been identified, the overall impact has been of a modest magnitude, with the VC market that witnessing a rapid recovery from the initial shock only a few months after the pandemic outbreak. VCs shifted their investments toward more mature ventures and pandemic related industries. Indeed, investments in the healthcare industry greatly increased. The time and complexity to conduct the different investment phases increased, especially in the valuation phase. VCs reacted to the higher uncertainties by increasing their investments conducted through syndication, mostly to access the capital available of the syndicate partner, share the investments' associated risks and to expand their deal sources. While selecting whether to invest or not in a venture, the possibility to access public financial incentives and the favourable economic environment acquired a substantial importance, with the level of self-confidence in decision making that reported a decrease. The pandemic also led VCs to explore the use of different types of financial metrics with respect to the most common ones and to decrease the target IRR percentage of the VC fund. Only early-stage VCs increased their target IRR at fund level. While evaluating investments, factors like the anticipated exit and the market competition greatly gained importance, and the target/cash-on-cash multiple required sensibly increased. Due diligence resulted as the factor more impacted in deal structuring, while the relative importance attributed to the different contractual features increased, showing a more concerned approach of VCs while contracting with entrepreneurs that were still able to enjoy a shift toward more founder-friendly contractual terms. Also, the frequency with which VCs interact with their portfolio companies greatly increased, with multiple times a week interaction that became the normality. Along with the increase in interactions, the most frequent value-added activity conducted with the portfolio ventures was providing strategic guidance, with a significant frequency increase in providing operational guidance. Concerning deal closing, a huge increase in exit frequency through IPO has been recorded, coherently with 2021 being a record-breaking year for the number of IPOs conducted and the amount of capital consequently raised. Overall, the VC market is rapidly recovering, as a matter-of-fact VCs reported on average 60% of their portfolio companies to have been positively affected or not affected at all by the COVID-19 pandemic.

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Introduction

The unforeseen arrival of the COVID-19 disease severely disrupted the global economic environment. The introduction of lockdowns and social distancing measures with the consequent disruption of supply chains, the different governments responses around the world to contain the spread of the virus and sustain the economies, along with a crisis that for the first time impacted contemporarily the whole world, introduced new types of uncertainties that were never experienced by the VC market, that is also dependent on the economic environment in which it operates.

To this regard, the scope of this thesis is to investigate and study the changes introduced by the pandemic in the investment strategies and practices adopted by venture capitalists, through a pre and post COVID-19 comparison, to understand how they reacted to this new mutated environment.

The study is divided in four main parts:

1) Initially, a general overview of the Venture Capital environment is presented, describing the context in which VCs operate, the different typologies of venture capital and their organization, the market trends, and the concrete effects of VC in innovation and the general economic environment.
2) The second part is dedicated to the literature review related to the Venture Capital Cycle, explaining the whole lifecycle of a VC fund, starting from its creation to the description of all the different steps included in the investment process, with a focus on the decision-making that takes place during these phases.
3) The third part focuses on the relationship between Venture Capital and crises, firstly introducing the new COVID-19 crisis and then presenting a literature review on the effects of past financial crises and the recent COVID-19 pandemic on the Venture Capital investment practices.
4) The last part is instead dedicated to the presentation of the analysis conducted. Firstly, the survey design, the methodology and the summary statistics are introduced, then a focus on the results obtained by the study and their implication is provided.

1. Venture Capital Landscape

1.1. Definition

Venture Capital (henceforth, VC) is a form of industrial finance, part of the private equity industry, that acts as financial intermediary to invest in private young ventures with a significant grow potential (Landstrom, 2007). VC funds are active equity investors that also provide strategic, marketing, financial, and administrative advice to small entrepreneurial firms as their objective is to maximise their financial return by exiting investments through a sale or an initial public offering (D. Cumming & Johan, 2010; Metrik & Yasuda, 2010). In practice, VC firms invest in small and emerging companies that may not have revenues yet, by acquiring part of their equity stake, usually remaining minority shareholders, with the aim to successfully let them grow and expand, increasing their value and finally sell the owned stake later on at a higher price. Investing in these young ventures is usually very risky, as they operate in unpredictable and rapidly changing markets with a high possibility of failure, therefore VCs require a high rate of return on their investments and each fund invests in different start-ups to diversify its portfolio and reduce the associated risks (Buchner et al., 2017). Indeed, Gompers et al. (2020) showed that 32% of VC investments fail and an undefined percentage of exits through M&A are camouflaged failures.

On the other side, VC can be considered as an important source of financing and expertise for these early-stage ventures that might otherwise have difficulty attracting funds (P. Gompers & Lerner, 2001), and it is important to distinguish it from private equity (PE), as they are both part of the private equity market. Even if some of the activities carried are similar, the main differences are:

- VC firms usually target companies in seed, early, mid, and late stage while PE firms target mature companies that go from late stage/growth equity onwards.
- VC firms acquire minority stake, while PE ones do control investing, i.e., they acquire a majority stake, consequently the size of the investment is lower for VCs.
- PE firms usually invest in established businesses that are deteriorating because of operational inefficiencies, while VC firms invest in new promising ones.
- VC firms take riskier investments while PE firms are more risk averse and target safer investments expecting lower returns.
- VC firms' investments have a shorter duration as they tend to exit as soon as the company goes public while PE firms maintain the investment for a longer period.
- VC firms invest using equity, while PE ones use a mixture of equity and debt.

Thanks to the expertise provided to increase the value of the venture, also called post-investment activities, VC can be defined "as the most appropriate financing mechanism for new high-tech

entrepreneurial ventures, whereas debt financing is generally considered to be unable to address the specific needs of these nascent businesses in highly risky and uncertain markets" (Bertoni et al., 2016, p. 1).

1.2. Types of Venture Capital

It is possible to distinguish different forms of VC investors according to their configuration of ownership and governance, each with different objective and investment strategies, that in turn produce different effects on investee firms' conduct and performance (Bertoni et al., 2013, 2015; Rin et al., 2013). These types of VC investors can be classified in Institutional/Independent and Captive/Non-Independent, depending on their type of ownership.

Independent Venture Capital (IVC): It is the most common form of VC, organised as a limited partnership agreement between investors, denoted as Limited Partners (LP), and venture capitalists, denoted as General Partners (GP). The former are usually wealthy individuals, pension funds, firms, or institutions that only provide the capital to be invested as they have no direct influence on the decision-making, while the latter may be individuals, corporations or limited liability companies that provide their expertise and manage the fund, i.e., all the investments, in exchange for a management fee and a significant profit participation. Note that the general partners are not organizationally dependent on limited partners, i.e., they are related only through the partnership agreement. Specifically, the objective of the fund, managed by the LPs, is to invest the money raised, i.e., the investment of the GPs, in different ventures and after a certain amount of time, usually around 10 years, exit from these investments and distribute the returns to the GPs, and to the LPs through a profit participation. Therefore, differently than other types of VCs, IVCs final aim is only to obtain high financial returns on the investments. As previously stated, LPs are paid through a management fee that is periodic, usually paid semi-annually, and it is calculated as a static percentage (on average 2.5% per year) of the capital commitments of the fund, regardless of its performance, and a profit participation, also called carried interest, that is variable as it is a percentage (on average between 15–30%) that depends on the profits realized by the fund (Sahlman, 1990). Although this last method of payment clearly aligns the interests of the LPs to the one of the GPs, agency problems still exist. As an example, Gompers (1999) showed that, at a general level, there is no relation between incentive compensation and performance, since for new and smaller firms the management fee is higher, while the carried interest and the sensitivity to performance is lower with respect to old, established firms. New VC firms, not having shown their ability, are initially induced to work harder, and offer more competitive terms, without explicit pay-for-performance incentives, with the aim to build reputation and adjust fees in sequent funds. Restrictions and covenants are also present

in the agreement to align the incentives of LPs and GPs. Examples of such covenants may be the restrictions on the size of the investment in a single venture, on the use of debt by general partners, on investments in public securities or other asset classes but also the prohibition to open a new fund before closing the existing one or to invest in areas where the VC is not competent.

A Captive VC is an investment vehicle or a business unit of a parent company, that uses its own capital to invest in other ventures. This type of VC is not based on a limited partnership, and there is not a limited life fund structure in the agency relationship, differently to IVC. Captive VC is usually less involved in providing activities that increase the value of the venture, and the parent company has an influence on the investment decisions as VCs invest on its behalf. Depending on the type of parent company it is possible to identify different types of Captive VCs:

Corporate Venture Capital (CVC): It is a type of VC which has as parent a non-financial corporation. The goal of the fund is not only to obtain financial returns through investments, but principally to let the parent company acquire new technologies to drive its innovation and create new opportunities. CVCs are usually organized as separate units within the corporation that maintain a certain degree of freedom, but they can also be organized as informal groups inside units, such as in a company's research and development department. Additionally, there is no limited partnership behind each fund, so corporate venture capitalists are compensated like normal employees with salary and bonuses.

Bank-affiliated VC (BVC): A BVC has as parent company a bank, that supplies capital directly from its balance sheet, allocating a notional commitment amount, e.g., capital per year to be invested. Banks establish venture capital companies as separate divisions, whose objective is to increase the parent's income by expanding its business acquiring new customers through ventures that allow the sale of additional services like advisory, capital raising and arranging fees. A BVC has lower pressure to maximise returns on investments, and it usually invests in late-stage ventures as it is more risk-averse with respect to IVC. Also in this case, venture capitalists are employees governed by labour contracts.

Governmental VC (GVC): GVC is an investment vehicle, structured like a VC fund, owned by a government. The investment objective is to close the "financing-gaps" created by the misalignment of financing supply provided by the private venture capital (PVC) market across all venture stages, by funding riskier, early-stage ventures that due to the higher uncertainty are less financed by private venture capitalists. GVCs target social returns, as they aim to promote local economic development, by improving market structure, creating new employment, and fostering innovation. Usually, GVCs invest alongside

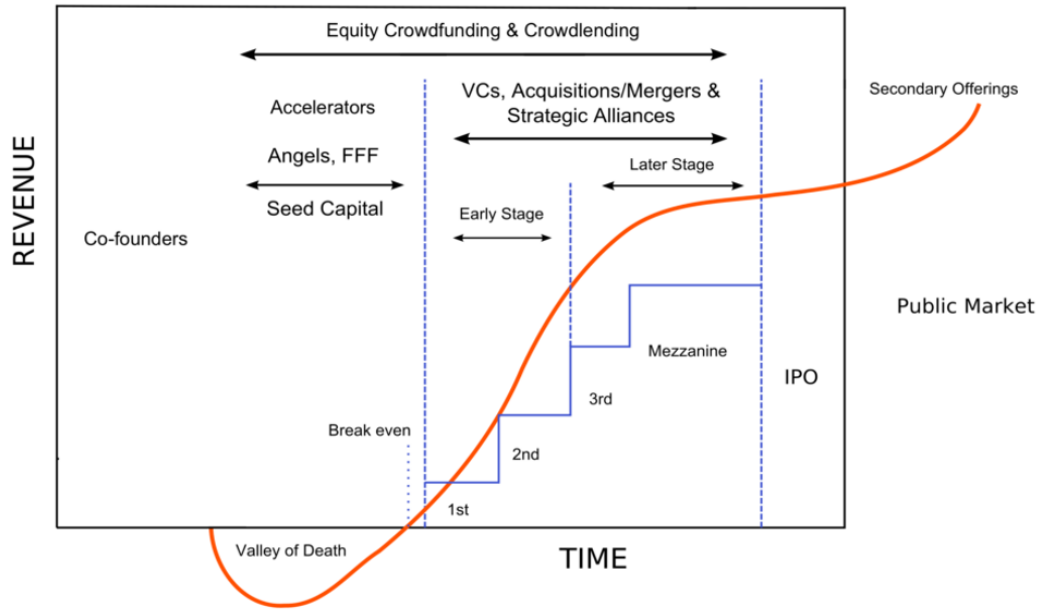
private venture capitalists, sometimes with an option to "buy-out" the government funding at lower rate of return, to provide a leverage effect. Also, differently to PVC they keep the investment for a longer period, and they don't have a defined exit strategy.

1.3. Venture's Financing Cycle

Another common distinction done while considering a specific type of VC depends on the maturity of the targeted ventures. Generally, it is possible to differentiate early-stage and late-stage VCs, with the former targeting seed and early-stage ventures, while the latter targets mid and late-stage ventures. Therefore, a brief description of the related financing cycle is presented to better understand the context in which VCs operate, but firstly, it is important to describe how the funding is organized. Each venture raises funds during the so-called funding "rounds", for which usually a "series" is associated. The first "official" founding round but also the lowest in size is called Series A, the second is instead called Series B and, except the venture loses value during the process, has a greater size than the preceding one. The logic is the same proceeding with the subsequent financing rounds (Series C, D, etc..). Usually, Series D is the last round prior to the actual IPO or acquisition, but ventures may even stop at a precedent round or even go further. **Figure 1** shows the typical financing cycle for a start-up, but obviously there may be changes depending on the specific situation. A common practice used by VCs to invest in early rounds to continue in later ones, the so-called staged-financing.

Figure 1

Venture Financing Cycle



Note. From (Ojeaga, 2015).

Pre-seed: At this stage founders only have a business idea, they invest in their venture, and they try to raise funds from friends, family, or "fool", the famous FFF, to start the initial operations. As the venture is at an embryonic level, investors are more likely to invest on the team rather than the product itself, and they usually invest small amounts expecting high returns as the involved risks are very high. An MVP is created in this phase.

Seed: The company requires funds to start all the initial activities, conduct the different market research, e.g., identify customers and estimate potential demand, up to the product development. The typical investors are business angels and early-stage VCs, that still expect high returns due to the associated risks, additionally the financing in this stage starts to be formally recognized.

Early: The company has a higher degree of maturity, therefore experience, and it requires new funds to continue its growth and scalability. At this stage the product has already been completed and the venture even started generating small revenues, therefore the main objective is to expand its market share, i.e., develop distribution channels, increase the quantity of customers, geographical reach, etc., and create a strategy for long-term profit. In this phase Series A and B funding are usually raised.

Mid-Late: At this stage the venture is already established, it generates profit and has a consistent user base. Fundings are raised to further expand the business and accelerate the growth, like promoting international expansion and reaching new markets, even developing new products, and acquiring new business. Due to the higher maturity of the venture, the risks associated with the investments are greatly reduced, attracting more investors like banks, late-stage VCs, private equity firms and hedge funds. Series C and D funding are included in this phase.

1.4. Impact of Venture Capital

Venture capital activity strongly influences companies that receive its fundings with tangible effects that go well beyond the firm level, also shaping the macroeconomic environment.

VCs impact their portfolio companies not only from the financing point of view, but also thanks to a series of value-added activities conducted. Their active monitoring and participation in the companies' management, sharing their expertise and knowledge, and the leverage on their broad network of contacts to help the creation of connections from both supply and demand side but also with providers of different professional services, greatly affect the ventures' performances. To understand the effect of VCs on firms, different perspectives can be adopted. Looking for the impact of VC-backed ventures in the general economy, Alemany & Martí, (2005) observed that employment, sales, gross margin, total

assets, net intangible assets, and corporate taxes significantly grow faster for VC-backed firms with respect to similar companies that are not financed by VCs. Specifically, the difference in growth rates is relevant for early-stage and mid-stage ventures. Furthermore, there is a positive correlation between these growth rates and the cumulative VC investment in a firm. Coherently, Engel (2002) showed that VC-backed firms realize higher growth rates, especially the employment one, with respect to non-venture-backed firms. Considering instead the influence of VC on firms' strategies, it extends across several strategic dimensions. VC shapes product market strategies, significantly reducing the product time to market (Hellmann & Puri, 2000); it influences human resources policies, professionalizing the firms' internal organization also helping hiring employees (Hellmann & Puri, 2002); it increases cooperative commercialization strategies, that is the creation of strategic alliances and technology licensing (Hsu, 2006); it also pushes firms to build absorptive capacity and implement innovation strategies with more permanent in-house R&D efforts (da Rin & Penas, 2007). Additionally, being VC-backed significantly increases the possibility for a firm to go public through an IPO, e.g., half of the public companies within the last fifty years in the U.S. are VC-backed (Gornall & Strebulaev, 2015). VC-backed IPOs even outperform non-venture-backed IPOs (Brav & Gompers, 1997). Lastly, looking at long-term firms' performance after IPO, Brown (2005) analysing the high-tech sector in the U.S. detected that in the decade post IPO, VC-backed firms survive longer, grow faster, invest more in R&D, have higher operating performance, raise more external equity, and have a greater impact on the industry with respect to the similar companies without VC-backing.

Regarding the effects of VC from a macroeconomic perspective, a higher level of VC financing stimulates the creation of businesses, as more firms than the financed ones are created due to an increase in the supply of financing that encourages entrepreneurs to start ventures but also thanks to a transfer of knowledge of funded companies to other aspiring entrepreneurs, with a greater effect in countries with higher entry costs and protection of intellectual property rights, and lower taxes on capital gains (Popov & Roosenboom, 2013; Samila & Sorenson, 2011). This business creation effect also contributes to the fact that VC significantly raise employment growth and job creations, with VC activity that even has a positive effect on the aggregate income and production of patents (Belke et al., 2003; Mollica & Zingales, 2007; Samila & Sorenson, 2011). Coherently, Kortum & Lerner (2001) observed that higher VC activity in an industry is associated with higher patenting rates. As a matter of fact, among publicly traded firms worldwide, four of the top five firms by market capitalization as of January 2022 were backed by VC prior to their IPO. Indeed, VC contributes to the economic growth through the introduction of new products and processes on the market, i.e., innovation, and the improvement of the absorptive capacity of the knowledge generated by private and public research institutions, with a high VC intensity that

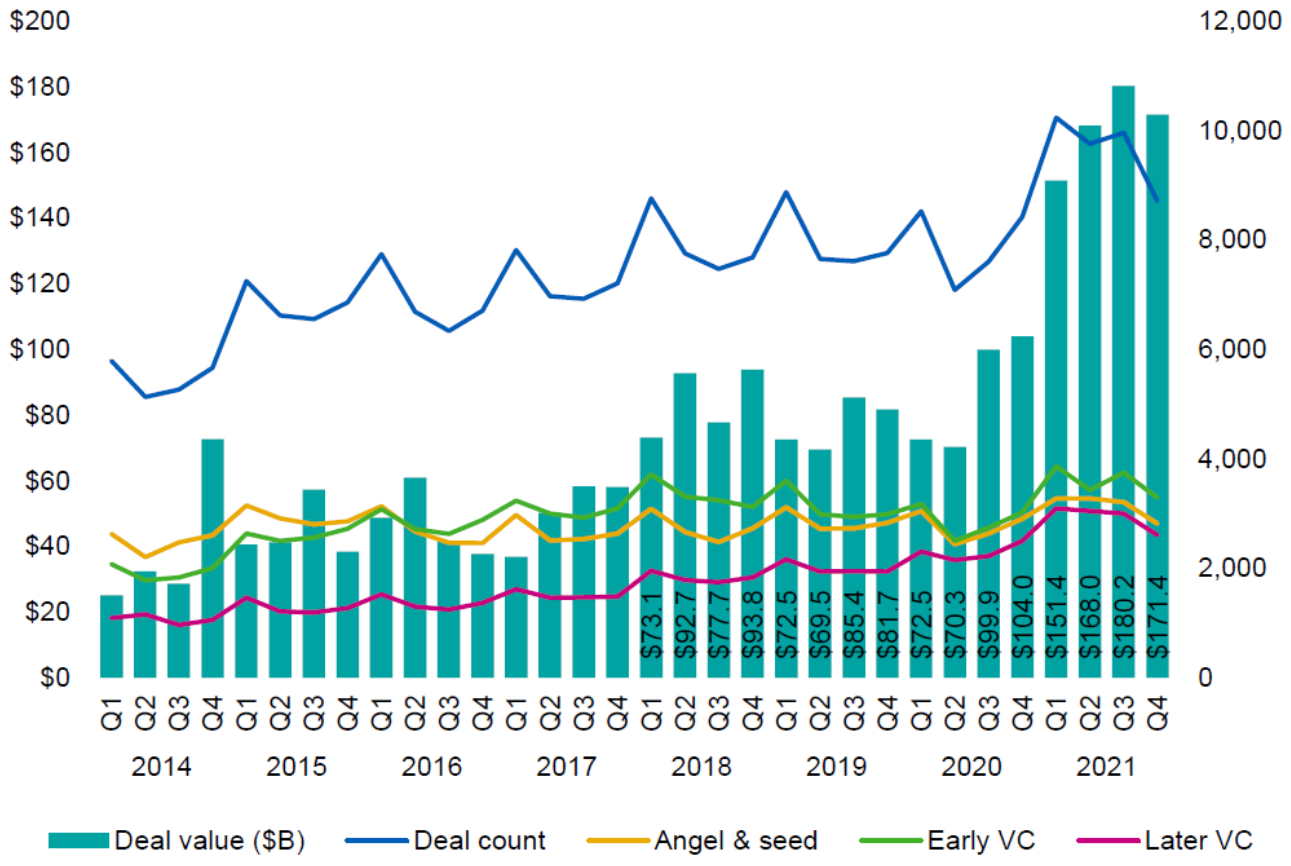
favours the transmission of knowledge into new product and processes (van Pottelsberghe de la Potterie & Romain, 2004).

1.5. Market Trends

2021 was a record-breaking year, with the global VC market reaching all-time peaks both in terms of number and total value of deals, confirming the growth trend of the market despite the influence of the COVID-19 pandemic and economy-wide supply chain limitations, e.g., microchip shortage, and labour shortages. **Figure 2** shows the number of deals and the total amount invested in billions of dollars from 2014 to 2021 divided by quarters, with 2021 totalling $671 billion and almost 40,000 deals. Of these, $329.6 billion comes from the US, $181.2 billion from Asia, and $122.6 billion from the EU.

Figure 2

Global Venture Financing



Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

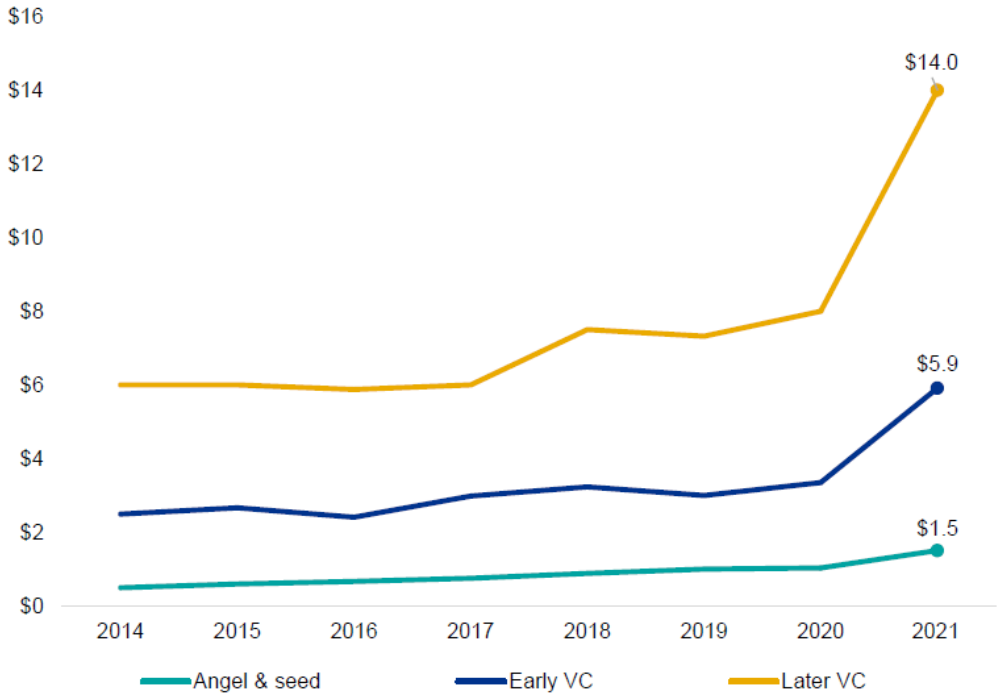
A possible explanation of this growth is given by the record levels of capital cycling through the system due to the expansive monetary policies adopted by central banking systems like the Federal Reserve in

the U.S. as response to the economic crisis induced by the pandemic. This conspicuous supply of money also led stock markets around the globe to hit all-time highs, leading investors to diversify their investments due to the "denominator effect", therefore increasing investments in the venture capital market, or broadly speaking, the private equity one.

Coherently, an overall deal value growth is also noticeable by looking at the deal size through stages (see **Figure 3**), with the highest increase presents in the late-stage, since the more developed and mature the venture the more funding it receives in each subsequent round, as shown in **Figure 4**. Furthermore, first-time financing reached its highest level at $5.43 billion with almost 12,000 number of deals, mostly thanks to some record-breaking raises.

Figure 3

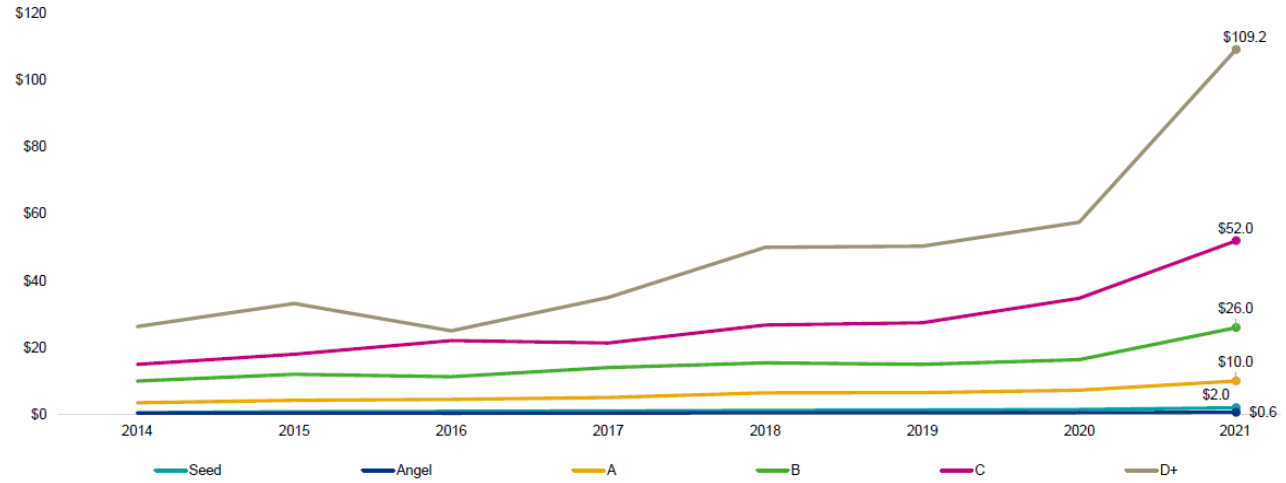
Global Median Deal Size by Stage [$M]



Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

Figure 4

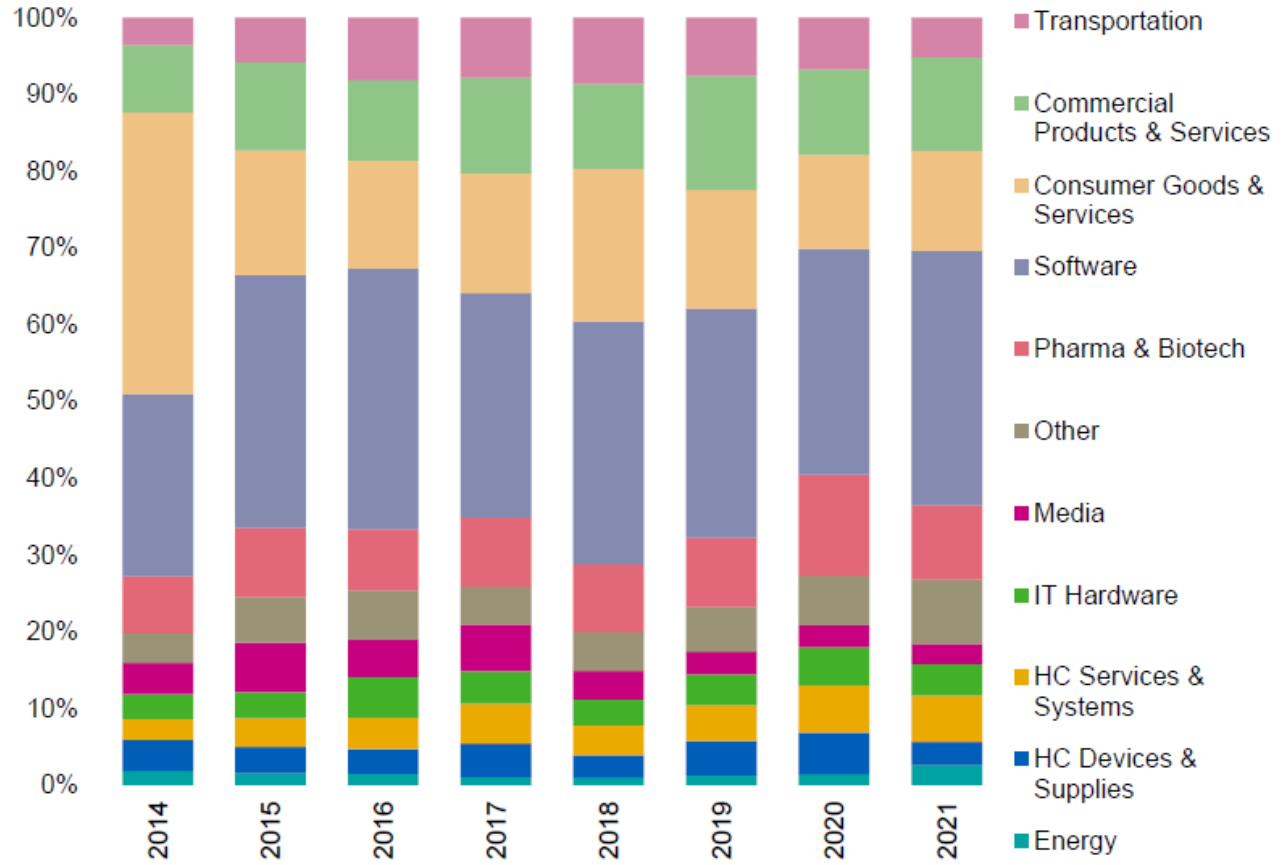
Global Median Deal Size by Series [$M]



Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

Figure 5

Global Financing Trends to VC-backed Companies by Sector [$B]



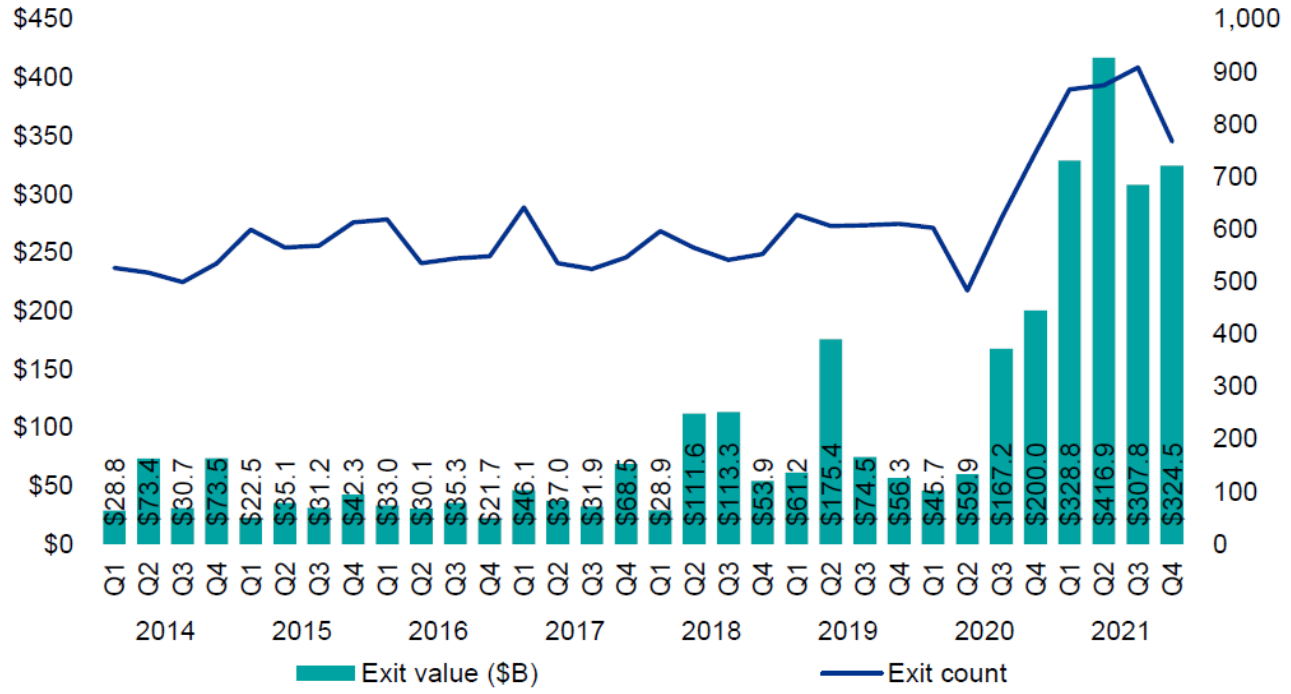
Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

Looking instead at the VC financing across industries, shown in **Figure 5** above, it is possible to observe the influence of the COVID-19 crisis and the resulting social distancing policies adopted that led to a decrease of investments in the transportation industry, and an increase of investments in the software industry, due to the higher software dependence for everyday activities like teleworking. Also, the pharma and biotech sector seems to be returning to the pre-crisis level, as it is evident that in 2020 it was a "hot market" due to the health crisis.

These record-breaking numbers also reached the amount of capital obtained by VCs through investment exits, e.g., IPO and M&A, totalling almost $1,400 billion in 2021, as shown in **Figure 6**.

Figure 6

Global VC-Backed Exit Activity

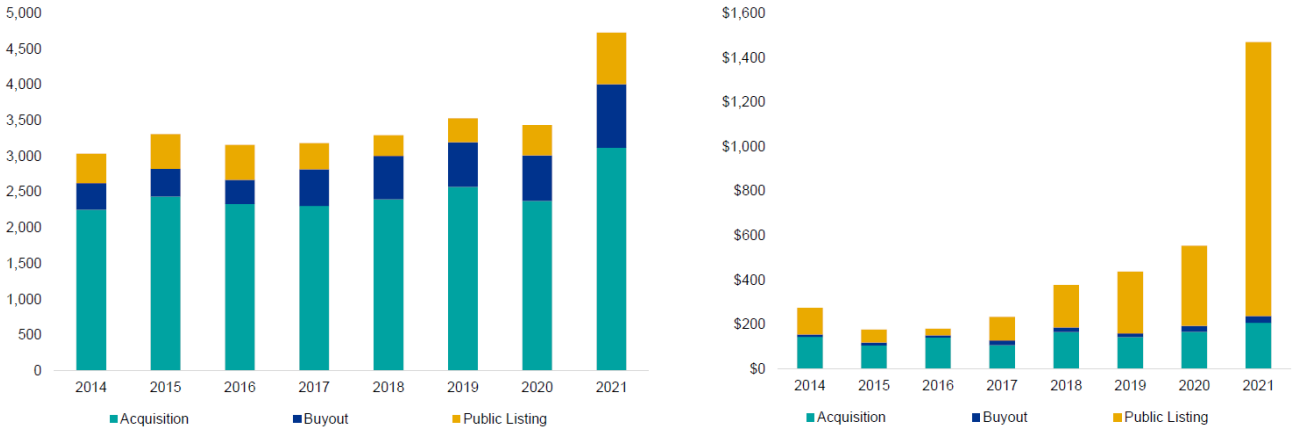


Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

Concerning the type of exits, while most of them are conducted through acquisitions, the vast majority of capital has been obtained through public listing, as shown in **Figure 7**. Also, a growth trend concerning the number of exits is noticeable, with 2021 that also set a record for the number of exits and IPOs that in proportion increased the most, almost equalling the number of exits through buyout.

Figure 7

Global VC-Backed Exit Activity by Type: Quantity (left) vs Total Amount (right)

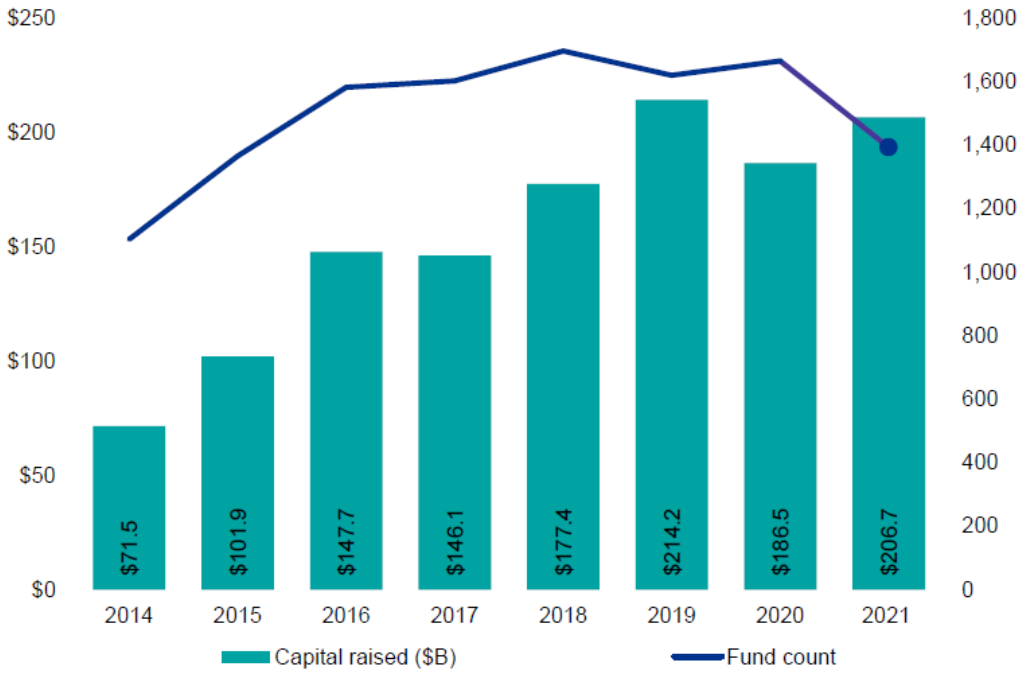


Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

Furthermore, as shown in **Figure 8**, the capital raised by VC funds surpassed $200 billion, almost reaching the record set in 2019, confirming the appeal toward this type of investment. Also, the trend shows a lower number of funds globally, indicating that the amount of money raised is more concentrated than the past.

Figure 8

Capital Raised by VC Fund



Note. From KPMG Private Enterprise (2022). Data provided by PitchBook, January 19, 2022.

2. Venture Capital Cycle

In this chapter, the venture capital cycle that consists in all the activities conducted by venture capitalists during the life of a fund, will be analysed.

P. Gompers & Lerner (2001) described the cycle, that on average lasts ten/twelve years, by evidencing three principal stages: 1) *Fundraising*, in which the capital needed to invest is raised; 2) *Venture Investing*, where all the activities concerning the investments are conducted; 3) *Exit*, during which all the deals are closed, and the capital is returned to investors.

2.1. Fundraising

The first step in the venture capital cycle is the creation of the fund itself by the VC firm. Depending on the structure of the firm, i.e., captive or independent, substantial differences may arise. During this phase a new VC firm firstly focuses on building the core team and define its strategy, for example deciding the reference industry, fund fees and size, number of investing partners, etc... If the firm is independent the relationship, through the form of limited partnership, between investors and the firm itself is first defined, deeply influencing how the VC firm will behave. Independent VCs need to also focus on marketing to capture the attention of potential limited partners that will then invest on the fund. Cumming et al. (2005) evidenced that funds with higher returns and performance fees and lower fixed management fees are able to raise more capital. The same happens to venture capitalists that provide financial and strategic/management expertise to entrepreneurial firms compared to the ones that only provide marketing and administrative expertise. Gompers & Lerner (1999) found that fundraising is also positively affected by a higher demand for venture capital, that is carried by higher GDP growth, increases in R&D spending and lower capital gains taxes, and by fund reputation that is given by higher past performances and number of successful investments exits through IPOs. Therefore, established firms with higher reputation raise large funds quickly and with little effort, this is why young venture capital firms take companies public earlier with respect to established ones, as they have the need to build reputation and raise capital for new funds, the so-called "grandstanding" behaviour (Gompers, 1996). Lastly, the existence of a vibrant stock market is fundamental to the VC market itself, as it allows new firms to issue shares hence investment exits through IPOs (Black & Gilson, 1999).

2.2. Venture Investing

The existing literature presents a variety of models, that change depending on the specific focus of the author, to describe the activities conducted during the investment process, sometimes also called the "venture capital process" (Landstrom, 2007, p. 177).

Hall & Hofer (1993) analysing different existing models stated that it is always the case that the VCs' decision-making is composed of distinct stages, and it also involves a screening and evaluation stage.

Tyebjee & Bruno (1984) proposed a generic model based on five stages:

1. Deal Origination (deal sourcing): search for investment opportunities.
2. Deal Screening: fast review of business plans and different proposals to select potential deals.
3. Deal Evaluation (due diligence): in-depth due diligence to validate business models and prospects, expected returns, of the selected deals.
4. Deal Structuring: establishing and negotiating the terms of the investments.
5. Post-Investment Activities: value-added activities and exits.

Fried & Hisrich (1994) focused instead on the process of finding and reaching the deal itself, proposing a model based of six-stage: 1) origination; 2) venture capital firm-specific screen; 3) generic screen; 4) first-phase evaluations; 5) second-phase evaluation; 6) closing. Even an 8 stages model was proposed by Hall back in 1989 (Hall & Hofer, 1993).

For the purpose of this study, a subdivision following Gompers et al. (2020) will be considered:

- Pre-investment:
    - Deal sourcing.
    - Investment selection.
    - Valuation.
- Deal Structure
- Post-investment:
    - Value-added activities.

Technically speaking Valuation and Deal Structure can also be considered part of the "Negotiation" phase. Also, even if most of the models consider exits as part of the investment process, it will be considered separately following as stated at the beginning of the chapter.

2.2.1. Deal Sourcing

Deal sourcing, generally called deal origination or deal flow, is defined as "the ability to generate a pipeline of high-quality investment opportunities" (Gompers et al., 2020, p. 175). It is the process where the VC firm reaches venture opportunities as it looks for potential investments and it is critical for the success

of the VC itself. Roure & Keeley (1990) showed that selecting the right investments is the driver influencing the most the probability of VC success. Coherently Sørensen (2007), through a two-sided matching algorithm argued that deal sourcing and selection are drivers of returns more important (60%) than the VC value-added (40%).

Two possible approaches are observable in deal origination: a *reactive* approach in which the VC just wait for investment proposals, and a *proactive* one where the VC actively seeks investments by, for example, creating networks, monitoring innovative environments, attending forums and university events to approach entrepreneurs. As the VC market presents competition, funds with proactive origination strategies are more efficient and have higher returns, thanks to a more efficient deal flow that is the result of a higher number and relevance of incoming opportunities, that in turn increases the odds of finding valid investments (Teten & Farmer, 2010).

But what is the deal source, i.e., how these deals concretely arrive under the lens of the VC firm?

Tyebjee & Bruno (1984) illustrated three types of deal source: 1) unsolicited "cold" (without any introduction) calls for 25.6% of the deals of the sample size analysed; 2) referral process for 65%: of which around 33% (21.5% of the total) from the VC community, 40% (26%) referred by prior investee and personal acquaintances, 10% (6.5%) referred by banks and 17% (11%) from an investment broker; 3) proactive search for just 9.4%. In a more recent survey, Gompers et al. (2020) showed that 31% of deals come from professional networks, 28% are proactively self-generated, over 20% are referred by other investors, 10% come inbound from company management, 8% from a portfolio company, and 2% from quantitative sourcing. Comparing the two studies, it is possible to observe how deal sourcing evolved: there is a considerable increase (9.4% to 28%) of deals selected through proactive search, probably supporting the previously shown results by Teten & Farmer (2010) that positively associate proactive origination strategies and returns; a reduction of "cold" call is also present (25% to 10%), evidencing the increased importance of the last source, referral process, that remained almost constant.

Fried & Hisrich (1994) argued that there are two reasons for there is a high percentage of referred deals: first, the VC may have confidence in the referrer' judgement thus increasing the probability to pass the screening phase; second the referrer may explain in a more clear and detailed way the type of investment.

At this point it is clear the importance of VC networks in deal sourcing as they are at the base of the referral process itself. A fundamental driver of network creation is reputation, i.e., the stakeholders' perception of the firm's ability to deliver value through its services, that serves as a signal of future successful performances based on previous (Dimov et al., 2007; Petkova et al., 2014). Furthermore, sector specialization enhances deal origination, as it allows for a deeper knowledge base, ability to add more value through an enhanced network and increase the possibility to become a reference source of financing in the domain, de facto increasing reputation, and the possibility to select high-quality ventures (Gompers

et al., 2009; Krishnan et al., 2011; Teten & Farmer, 2010). Being reputable also allows to be recognized by other VCs increasing the chance of obtaining (referred) deals through the practice of syndication (see section **Syndication**) where different VCs collaborate to finance one venture, sharing the risks and expertise.

Lastly, looking for possible variations in deal flow across stages, Gompers et al. (2020) showed that later-stage investors are more likely to proactively self-generate investments with respect to early-stage ones, which rely more on "cold" calls from entrepreneurs and referrals.

2.2.2. Investment Selection

The process of selecting the right investment opportunity can be divided in two different phases:

1. **Deal screening**: VCs quickly examine potential investments to decide whether they merit further evaluation.
2. **Due diligence**: A more in-depth analysis, e.g., industry analysis and peer comparison, of the potential investments that passed the deal screening phase.

Through their deal sources VCs receive hundreds of proposals that need to be addressed, Gompers et al., (2020) showed that for each successful deal a VC firm analyses around 100 potential opportunities, similarly to the results of Teten & Farmer (2010) that observed a ratio of 1 investment over 80 opportunities reviewed. Additionally, Smart (1999) showed how time consuming is the due diligence phase, stating that VCs spend around 120 hours only to evaluate the human capital of the entrepreneur, without considering other factors like the product or the market. This leads to severe time constraints by VCs that, as consequence, on average spend less than six minutes to review each potential investment during the initial deal screening phase (Hall & Hofer, 1993). Due to the great deal of time and effort required in evaluating and screening transactions, it is argued that the scarcest commodity a VC has is time, not capital (Kaplan & Strömberg, 2001).

Gompers et al. (2020) explained the process of sorting through these investment opportunities, also called "deal funnel". It is composed of different stages, where a substantial number of opportunities are eliminated on each further step. A quantification of the sorting effect has also been provided. Firstly, there is an initial screening phase, i.e., deal screening, where the potential opportunity is considered by the individual originator, i.e., a member of the VC firm. If the investment shows potential the originator goes and meets the management of the company at least once. Only one in four opportunities are able to arrive at this point; as a second step, if the originator still finds the investment attractive, he/she presents it to the partners of the VC firm. Only one third of the opportunities at first stage reach this second one; then, if the partners still find the opportunity convincing, they proceed with due diligence. Half of the investments arriving at the second stage reach this one; lastly, if due diligence is convincing

the term sheet to close the deal is proposed. One third of the investments that reached due diligence receive a proposal.

It is important to understand what factors, logics, are behind the investment selection choices done by VCs. Tyebjee & Bruno (1984) indicated the size of the investment and the fund's investment policy as a decision-making criterion during the deal screening phase. The VC firm is usually a small company run by a small number of people, Gompers et al. (2020) indicated an average of 14, and it is impossible to spread the portfolio over many different small deals, as the post-investment activities are equal regardless the size of the investment, leading to a reduced number of diversified deals of a bigger size. A trade-off between the capitalization of the fund and the diversification of the portfolio is also in place, reducing the overall size of the deal that is still flexible as bigger deals are considered through the practice of syndication (see section Syndication). Indeed, Jackson et al. (2012) demonstrated that a profit destruction effect comes in place increasing the number of investments if the VC is already intensely assisting portfolio companies, in coherence with Petty & Gruber (2011) whom identified that the composition of VC portfolio deeply influences the decision making, that also changes over the fund lifecycle, with VC fund-related reasons playing a more and more important role in deal rejection over time, as VCs construct their portfolios.

Petty & Gruber (2011) analysing previous literature also highlighted four characteristics that highly influence the decisions of the VC: the venture's management team, the market, the product or service and the venture's financial potential. Gompers et al. (2020), conducted a survey over a sample of 558 independent VC firms to understand the drivers of VC decision making, results are shown in **Table 1**.

Table 1

Venture Capitalists' Preferences During Decision Making

Gives Importance	%	Most Important	%
Team	95	Team	47
Business Model	83	Fit with the Fund	14
Product	74	Product	13
Market	68	Business Model	10
Valuation	56	Market	8
Fit with the Fund	50	Industry	6
Ability to Add Value	46	Ability to Add Value	2
Industry	31	Valuation	1

Note. From Gompers et al. (2020).

Looking across stages, significant differences with respect to previous results have been noticed in the product that is way more important for VCs targeting early-stage ventures (81%) with respect to VCs targeting late-stage ventures (60%) and the valuation that is instead more important to late-stage investors (74%) than early-stage ones (47%). Also looking at the most important factor, the team is more important to early-stage investors while the business model to late-stage ones, coherently with the fact that business related factors are more important at later stages where there is lower uncertainty about the business compared to early-stages where, in fact, the focus on the team is higher. These findings seem to be in line with part of the existing literature (e.g., Carlos Nunes et al., 2014; Narayanasamy et al., 2012), that also shows that a strong management is correlated with subsequent venture performances, and a higher possibility of going public (Kaplan & Strömberg, 2001). But while the importance of the management team seems clear, literature also suggests that VCs often replace members of the team before and after the actual investment (Bruton et al., 2000).

However, it needs to be highlighted that some of these studies may suffer from biases as results are based on data of actual investments, i.e., collected ex post. For instance, a study by Hall & Hofer (1993) based on verbal protocols, i.e., a real-time data collection method, found that market-based factors are more important in the initial deal screening phase, in coherence with the finding of Smart (1999) that indicates market factors as more important during deal screening differently to the due diligence phase where the team and product gain importance.

Tyebjee & Bruno (1984) highlighted five factors that influence the due diligence phase: *market attractiveness*, that refers to the size, growth and accessibility of the market and the existence of the market need; *product differentiation*, i.e., the uniqueness of the product that allows a competitive advantage, for example through patents, and high profit margin; *managerial capabilities of the venture's founders; environmental threat resistance*, that is the resistance of the venture from external factors like obsolescence due to the change in technology, the sensitivity to economic conditions or the entrance of new competitors in the market; *cash-out potential*, that is the potential final return on the investment. In reality, different other factors influence the decision-making:

- *Control over the entrepreneur*. VCs tend to prefer investments where they perceive to have higher control over the entrepreneur (Drover et al., 2014).
- *Public markets*. VC investors while making their investment decisions also rely on information provided by shifts of public markets, increasing their investments when these signals are favourable with more experienced VCs taking the greater advantage (Gompers et al., 2005). Also differences in VC market size influence the decision-making of VCs themselves. In the presence of thin VC markets, VC investors tend to invest in companies in need rather than then the best performers, as the latter are not interested in VC financing at all; in fact, this apply to Europe in

which VCs seems to not be as capable as the US ones in selecting the best performing ventures (Bertoni et al., 2015).

- *Fit with the fund*. Through a survey Tyebjee & Bruno (1984) identified that more than 60% of VCs invested in ventures part of their market/technological sectors of reference, due to specialization and the inability of the VC fund's manager to be knowledgeable across different technologies/markets. Generalist VC firms tend to underperform specialized ones, and this difference in performance is mostly driven by specialization that resides at the individual venture capitalist level, not at the firm one; also, specialization of both venture capitalists and VC firms leads to the selection of better investments within an industry due to a higher expertise (Gompers et al., 2009).
- *Connection*. Having a direct connection with the entrepreneur is highly correlated with the possibility of financing his/her venture. This is in line with the work of Shane & Cable (2002) that expressed VC financing as a function of network ties, indicating that the stronger the relationship between the entrepreneur and the VC, the higher the possibility to receive funds also thanks to lower information asymmetries. Furthermore, without a direct connection it is very difficult to capture the VCs' attention, as they receive hundreds of proposals.
- *Geographic location*. After investing in a company, the venture capitalist expects to regularly meet the management of the investee, also to effectively provide monitoring and value-adding activities. Therefore, to rationalize time and expenses, some VCs tend to invest in ventures that are close to them (Tyebjee & Bruno, 1984). But while it is true that closeness with the investee matters, in recent years the percentage of cross-border VC investment considerably increased, reaching 22% of the total number of VC investments in 2008 (Chemmanur et al., 2016).
- *Scalability*. Puri & Zarutskie (2012) showed that VCs focus on scalability instead of profitability. Coherently Block et al. (2019) noted a tendency of VCs to give more importance to high levels of revenue growth with respect to other type of private equity investors, explaining that this may be due to VCs' inclination to take riskier investments as they need to deliver returns to their partners in a relatively short amount of time.
- *Reputation*. Reputable VC firms are more conservative and risk averse as they focus on preserving their status, trying to deliver consistent performance over time. Therefore, they make use of risk reduction strategies like investing in less uncertain ventures, i.e., late-stage or high-quality ventures, but also exploring emerging sectors, (Dimov et al., 2007; Petkova et al., 2014).

Regarding the stage of the venture, evidence shows that VCs highly prefer to invest in early-stage ventures, with only a small fraction of them investing in late-stage ventures, also thanks to practices like

staged financing, i.e., funding the same venture repeatedly over its lifecycle (Block et al., 2019; Tyebjee & Bruno, 1984).

2.2.3. Valuation

While analysing the investment, prior to the proposal of the contract, the VC firm has to evaluate the venture, this is the first step of the negotiation process. To do so a quantitative or qualitative approach is possible. The latter is more based on "gut" feelings due to the high uncertainty given by the lack of historical operating information and future cash flows predictions, that make the appliance and reliability of any type of financial metric very difficult, i.e., using a quantitative approach.

Gompers et al. (2020) reported that around 9% of VCs over a sample of 546 institutional venture capitalists don't use any type of financial metrics to evaluate the venture, thus relying on a qualitative approach. They also investigated the most used financial metrics, observing that the MOIC (multiple of invested capital) is used by 63% of the sample, the IRR (internal rate of return) by 42%, then the NPV (net present value) at 22% and other types of metrics at 8%. It is also interesting to note that early-stage investors are more likely to not use any type of financial metric (17%) with respect to late-stage ones (1%) in coherence with the fact that uncertainty makes such metrics less reliable. Also, the average required MOIC is 5.5 with early-stage investors requiring 7.5 while late-stage ones 3.2, and the average required IRR is 31% still with early-stage investors asking a higher percentage (33%) with respect to late-stage ones (29%) logically asking a higher return due to the higher uncertainty. It is interesting to note that large size funds request lower percentages of IRR and MOIC with respect to small size ones, maybe due to lower capital constraints.

As for the reason that such metrics are used, a possible explanation may be that as VCs must report to their LPs, they are influenced by their perceived preferences, specifically by the fact that, as believed by VCs, LPs are primarily concerned about absolute performances like the MOIC or IRR, rather than relative ones, e.g., comparison to VC funds or main indexes.

In the same study the drivers behind the proposed valuation by VCs have been investigated, results are shown in **Table 2**.

Table 2

Factors Determining VC Valuation

Gives Importance	%	Most Important	%
Anticipated Exit	86	Anticipated Exit	46
Comparable Companies	80	Comparable Companies	29
Competitive Pressure	63	Desired Ownership	18
Desired Ownership	43	Competitive Pressure	3

Note. From Gompers et al. (2020)

It is important to highlight the fact that early-stage investors gives considerably more importance to the desired ownership with respect to late-stage ones that on the contrary care more about the anticipated exit.

Factors increasing the venture valuation are the attractiveness of the industry, particularly if it is highly differentiated, the quality of the founder and management team, and the size of the venture's network (Miloud et al., 2012). VC firm reputation instead allows them to get a discount on the value of the venture (Hsu, 2004).

Of course, the main risk while valuing a company is to over valuate it. Existing literature presents different studies that try to estimate the correctness of such estimates, as the work of Gornall & Strebulaev (2018) that through a valuation model for VC-backed companies examined a sample of 135 US unicorns, i.e., companies with a reported valuation of more than $1 billion. What emerged is that almost one-half of such unicorns will lose their status as post–money valuations averaged 48% above fair value, showing a clear tendency to over-valuate ventures, remarking the difficulty of such a task.

2.2.4. Deal Structuring

Deal structuring is the last part of the negotiation process between founders, existing investors, and new VC investors, where the contract related terms are defined. This is the final step that, if successful, leads to the realization of the investment by the VC firm.

As any type of relationship, principal-agent problems may arise. Kaplan & Stromberg (2002) identified four of such problems that VCs face, mostly arising due to information asymmetries and behavioural uncertainties:

- After the investment, the entrepreneur will not work enough to maximise value, as efforts are unquantifiable. A solution is to make the entrepreneur's compensation dependent on performance (the so-called moral hazard approach).
- The entrepreneur knows more about his/her quality or ability than the VC. A possible approach to screen good entrepreneurs may be a greater pay-for-performance or liquidation rights.
- In case of disagreement between the entrepreneur and the VC, the latter will want the right to decide. For this purpose, control rights are in place.
- The famous "hold-up" problem, where the entrepreneur may threaten the VC to leave the venture when his/her human capital is particularly valuable to the company. By vesting the entrepreneur's shares, the VC decreases the entrepreneur's incentives to do so.

Therefore, it is possible to distinguish four main contract terms that are negotiated in this phase:

- **Cash flow rights** that refer to the fraction of the venture's equity that different investors and management have a claim to. They include anti-dilution protection, i.e., the VC receives additional shares in case the venture raises new capital in a future round at a lower price, dividends, ownership stake, investment amount, valuation, and option pool, that is a set of shares used to incentivize and compensate employees.
- **Control rights** that determine who make decisions, especially in case of a conflict. They include voting rights, boards rights and seats, and pro rata rights that allow the participation in the next round of funding.
- **Liquidation rights** include liquidation preferences that give seniority position in case of liquidation, e.g., sale of the venture, participation rights, i.e., the investors can combine upside and downside protection, and redemption rights that allows the investors to redeem their securities or the repayment of the original amount.
- **Employment rights** that express the vesting of founders/employees' shares, that is the loss of shares in case of early leaving from the venture or noncompete provisions.

As an example, voting rights, boards rights and liquidation rights are allocated in such a way that if the venture performs poorly, VC can obtain full control. The better the performances the more control rights are obtained/retained by the entrepreneur while VC retains most of the cash flow rights and relinquishes most of its control and liquidation rights (Kaplan & Stromberg, 2003).

For what pertains the types of securities used, Schmidt (2003) illustrated the optimality of convertible securities for VCs as they can be used to allocate cash-flow rights as a function of the market environment and the entrepreneur's effort. These results are in line with Kaplan & Stromberg (2002) that showed that convertible preferred stock is the most used security, but also there may be cases where securities in

addition to convertible preferred stock or multiple classes of common stock are used. Furthermore, more experienced investors are more likely to use convertible preferred equity with respect to common equity (D. Cumming & Johan, 2008).

In any case no matter the types of security, financings allow different allocation of the cash flow, voting, board, and liquidation rights. Indeed, different securities are linked to different types of adverse selection risk and different types of ventures: convertible securities attract firms with low variability in returns, equity attracts those with low expected returns while debt financing attracts the ones with high variability in returns (Burchardt et al., 2016; Cumming & Johan, 2013).

In general, VCs are not so flexible on negotiating terms like pro rata rights, liquidation preferences, anti-dilution, valuation, board control, vesting and ownership stake. They seem to be flexible instead for what pertains participation, investment amount, option pool, redemption rights and dividends (Gompers et al., 2020).

2.2.5. Post-investment: Value-added activities

After reaching an agreement, VC finally invests in the venture. In this phase different activities are carried out by the VC firm as its objective is to maximise the value of the invested venture during the investment period to maximise the returns. To conduct such activities, VCs have the need to frequently interact with their portfolio companies, Gompers et al. (2020) reported in fact that 60% of the examined IVC sample interact at least once per week with their invested ventures.

Through factor analysis, Macmillan et al. (1989) identified four distinct areas of involvement: development and operations, management selection, personnel management, and financial participation. Cumming et al. (2005) instead identified that VCs pursue financial, marketing, administrative and strategic value adding activities. A more comprehensive classification of such activities has been proposed by the work of Large & Muegge (2008) that first divided them in two main categories, external or internal, depending on the orientation of the activity with respect to the environment of the venture.

- External:
    - **Legitimation** represents the passive value added to the venture due to the association with the VC. An example is the increased reputation and credibility.
    - **Outreach** represents the active value added to the venture due to proactive activities done by the VC to create connections to the venture with key external stakeholders and their consequent commitment.
- Internal:
    - **Recruiting activities** consist in advising/recruiting talented individuals.

- **Mandating activities** let the management team focus on KPIs preventing distractions. An example is the definition of performance targets.
- **Strategizing activities** are about providing guidance for senior and middle management decisions to the venture managers and directors. Examples are the assistance given by the VC to develop the business concept and strategies or maintaining focus on long-term strategic objectives or doing strategic planning.
- **Mentoring activities** are similar to the strategizing ones but are less formal and consist in instructing the entrepreneurs on the start-up environment. Examples are the VC providing mentorship, motivation, coaching and guidance.
- **Consulting activities** provide the structured knowledge required by the senior managers and are usually conducted in response to a request for assistance. Examples are the provision of intelligence and expertise.
- **Operating activities** consist in the direct managerial involvement of the VC in the venture, completing the everyday management team capacity. Examples are active planning, monitoring, and controlling.

Gompers et al. (2020) identified in which percentage VCs conduct the different types of value-added activities, results are shown in **Table 3**.

Table 3

Value-Added Activities Conducted by VC, by Percentage

Activity	%
Strategic guidance	87
Connect investors	72
Connect customers	69
Operational guidance	65
Hire board members	58
Hire employees	46
Other	20

Note. From Gompers et al. (2020)

From this same study emerged that early-stage investors are significantly more active in connecting investors with respect to late-stage ones, consistent with the fact that there is a higher competition for late-stage deals. Furthermore, Macmillan et al. (1989) analysing the differences in activities involvement

between the VCs and the entrepreneurs, showed that VCs are more involved in the financial aspects of the venture, while they are present a lower involvement for activities related to ongoing operations.
It needs to be highlighted the fact that during this post-investment phase, the VC firm can participate in sequent financing rounds of the venture, this is the so-called staged financing. Sahlman (1990) defined this practice as "the most important mechanism for controlling the venture" (p. 506) as it reduces agency problems by protecting the VC firm by increasing its bargaining power, but also it allows the VC firm to wait and see whether the venture is worth more investment, thereby avoiding committing too much capital too soon. Indeed, Gompers (1995) showed that agency and monitoring costs can be minimised through staging, as funding can be discontinued if the probability of the venture to go public becomes low. Staging also mitigates the problem related to the commitment of the entrepreneur to not renegotiate down the value of the venture to an outside investor in a future financing round, that instead would not be controllable if the venture is financed up front (Neher, 1999). In practice, early rounds of investment create collateral that support later rounds. Bergemann et al. (2009) through a dynamic model of venture capital financing, found that the higher the failure risk the lower the initial investment flow that then accelerates as the projects mature. Also, there is a positive correlation between the information received during the venture development and the investment flow. Lastly, investors distribute their investments over more funding rounds if the failure risk is larger. Factors like market uncertainty and economic policy uncertainty lead VC firms to delay investments at each round of financing, whereas competition, project-specific uncertainty, and agency concerns prompt VCs to invest sooner (Huang et al., 2022; Li, 2008; Panda & Gopalaswamy, 2020).

2.3. Deal Closing

The last step of the venture capital cycle is the exit, where VCs capitalise over their investments by turning illiquid stakes in private companies into realized returns.
Two principal forms of exit from a successful investment are the Initial Public Offering (IPO) in a stock market, and the acquisition, e.g., selling to an incumbent firm that has a strategic interest, with both that also have the effect to increase firm reputation (Amor & Kooli, 2020; Gompers, 1996; Sahlman, 1990). There exist other exit routes, like secondary sales where the VC firm sells its stake to another investor, buybacks where the entrepreneurs repurchase VC's shares, and write-offs, i.e., the venture is liquidated. These last types of exits are less remunerative; therefore, VCs pre plan their exits through IPOs or acquisitions, shaping cash flow and control rights during deal structuring (D. Cumming & Johan, 2008). As VCs invest through funds that last around 10 years and their remuneration is also dependent on investments return, the timing and type of exits is crucial (Sahlman, 1990). Indeed, Cumming & Johan (2010) showed that venture capitalists exit when the expected marginal cost of maintaining the investment

is greater than the expected marginal benefit; they relate the investment duration to characteristics of the deal, entrepreneurial firm, and investor and to institutional and market conditions. Venture capitalists take firms public when equity valuations are higher, i.e., at market peaks, while the rely on private financings when valuations are lower, with more experienced VCs being more proficient at timing IPOs (Lerner, 1994b). Amor & Kooli (2020) observed that to build reputation young VC firms are willing to accept a lower premium in the case of M&A exits and to bear the cost of higher underpricing in the case of IPO exits as they tend to "grandstand" that as Gompers (1996) first evidenced, make young VC firms take riskier investments and take portfolio companies public earlier than the peak profit moment. More reputable VCs are in fact more likely to exit through an IPO over an acquisition, access public markets faster, exit successfully, and are associated with superior post-IPO long-run firm performances (Amor & Kooli, 2020; Krishnan et al., 2011; Lee et al., 2011; Nahata, 2008).

Additionally, VC-backed IPOs have significantly lower fees compared to non-venture IPOs, and VCs retain a majority of their equity after the initial public offering as a commitment device, as it would look like VCs are "cashing out", sending a negative signal to the market (Gompers & Lerner, 2001). A predefined period, usually six months, needs to pass before VCs can sell their stake to the market or distribute it to limited partners, the so-called "lock-up" period (Brav & Gompers, 2000).

As previously stated, exits are also possible through secondary markets, i.e., secondary sales, this is because a VC firm may be financially constrained due to the raising of a new fund or a liquidity shock, being forced to sell a promising venture prior to IPO/acquisition, or also because of opportunistic behaviours by the VC itself to dispose of a lemon, i.e., a nonperforming venture (Andrieu & Peter Groh, 2021).

In emerging markets, VCs often exit through buybacks, as they can be an efficient solution when VCs have a stronger bargaining power with respect to the entrepreneurs, leading both of the parties to invest up to the efficient level (Wang & Wang, 2017).

Streletzki & Schulte (2013) identified three predictors' elements of "high-flyer" exits, i.e., exits that returned more than five times the initial capital invested: company, product, and market related factors like being located in a metropolitan cluster close to the lead investor or targeting B2C market.

In conclusion, Gompers et al. (2020) indicated that the average VC firm reports 15% of its exits through IPOs, 53% through M&A and 32% as failures, suggesting that the high percentage of M&As may be influenced by disguised failures.

2.4. Syndication

One of defining features of the VC industry is the practice of syndicating investments. VC firms form syndicates in which through cooperation they provide capital to invest in a single venture for a joint payoff either in the same investment round or at different points in time (Brander et al., 2002).

Literature presents different reasons as to why VC syndicate investments. From a portfolio management point of view, syndication can be used to diversify the portfolio, thus reducing its idiosyncratic risk, but it also allows the sharing of the investment risk with other investors (Bygrave, 1987). Also, syndication makes the overall venture investing process more efficient by improving: the access to deal flow, as expanding the VC syndication network increases the status and visibility of the firm, that in turn increases the possibility of being invited in other syndicates, but also syndicating out deals increases the possibilities of reciprocation; screening, due diligence, decision making, and value-added activities due to the sharing of information, specific knowledge and complementary skills between members of the syndicate (Bygrave, 1987; Lerner, 1994a; Manigart et al., 2006). It is worthy of note the fact that this knowledge sharing effect allows a VC firm to invest in ventures that are in different industries and stages with respect to the firm specialization and allows the internationalization of the firm letting it reach ventures, with respective information, that are located outside of the geographic region and reach of the firm. Indeed, Sorenson & Stuart (2008) found that there is a higher probability that geographically and industry distant ties will form if the size of the syndicated investment and the density of relationships among the members of the syndicate is higher. Syndication also decreases potential agency problems, increases the bargaining power of the VCs towards the entrepreneur, leads to higher performances and returns and lowers underpricing in IPOs (Jääskeläinen, 2012; Manigart et al., 2006).

Logically, syndication is more pronounced for younger and less reputable firms, as they face higher uncertainty, and lack expertise thus benefits the most from the partners' knowledge (Hopp & Rieder, 2011). Indeed, more reputable firms are more desirable as network partners, as less reputable firms benefit the most from the transfer of proved knowledge and know-how, but also gain reputation through association, with more reputable firms that instead benefit from better contract terms over less reputable ones thanks to their status (Gu & Lu, 2014; Tykvová, 2007).

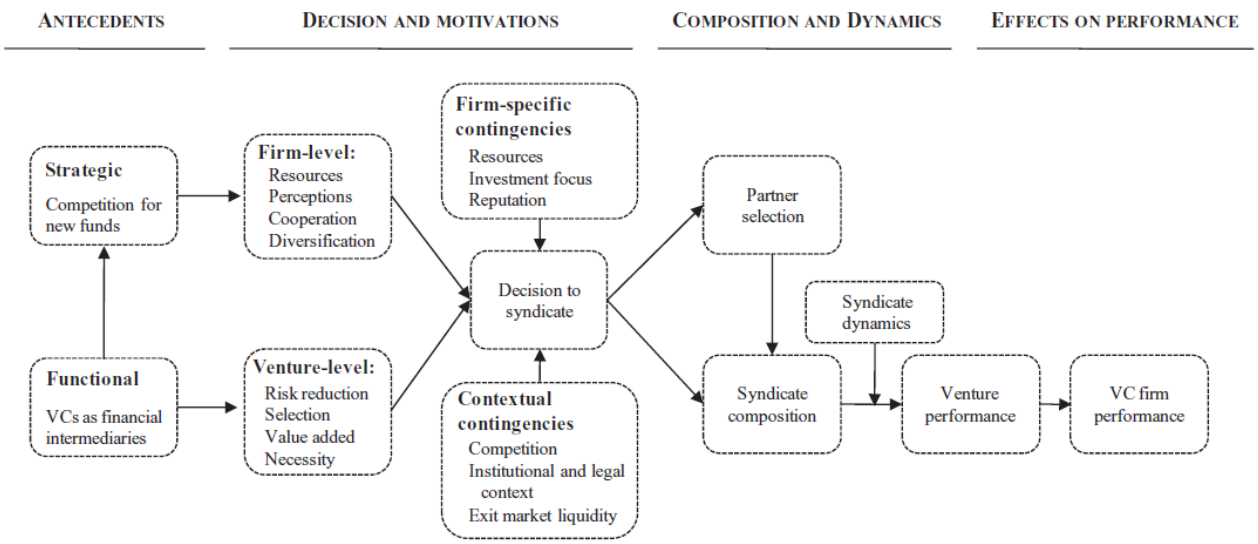
Comparing reasons to syndicate between early-stage and late-stage investors, Manigart et al. (2006) showed that factors like risk sharing, portfolio diversification and access to larger deals are more important than deal screening and monitoring for both type of investors, with early-stage investors giving more relevance to value-added activities with respect to the late-stage ones.

In conclusion, Jääskeläinen (2012) while examining existing literature, evidenced a four steps structure of the syndication process (see **Figure 9**) starting from the antecedents of syndication, the decisions and

motivations to syndicate both at firm and venture level, the structure, composition and dynamics, to the effects on performances.

Figure 9

Structure of the Syndication process



Note. From (Jääskeläinen, 2012).

3. Venture Capital under Crises

This chapter provides a more accurate focus on the relation between VC and crises. Firstly, the COVID-19 pandemic crisis is briefly introduced to provide additional context, then a literature review on the influence of previous financial crises and the current COVID-19 crisis on VC investment practices is conducted.

3.1. The COVID-19 Pandemic

In December 2019 an outbreak of a novel coronavirus, later called COVID-19, in the Chinese city of Wuhan was identified. With the aim to limit the spread of the virus, the Chinese government imposed a lockdown in Wuhan and other cities in Hubei on 23 January 2020, but by mid-February a first outbreak outside China was spotted in Italy. By March 11th, 2020, the World Health Organization (WHO) declared to the world the outbreak of a global pandemic, turning into a global health crisis. To prevent the spread of the virus different measures like lockdowns, travel limitations, and social distancing policies were adopted by governments, disrupting supply chains, and putting on halt entire industries, resulting in severe economic shocks. Equities plummeted, and the market volatility rocketed upwards around the world. As example, the U.S. stock market saw one of the worst crashes in history, with the Dow Jones Industrial Average (DJIA) losing around 26% in just four days in March 2020 (Mazur et al., 2021). In the middle of this same month, volatility levels of the U.S. stock market surpassed even the ones reached during the Great Financial Crisis of 2008 and the Dotcom Bubble Burst of 2000, arriving at levels comparable only to the Black Monday of 1987 and the Great Crash of 1929 (Baker et al., 2020). Governments around the globe provided significant subsidies and aid programs that still didn't stop effects like business closures, higher levels of unemployment, shifts in spending behaviour and disruption of supply chains. Furthermore, Hu & Zhang (2021) observed a reduction in firms' performance around the globe, with a lower firms' ROA where a higher incidence of cumulative cases is present. The Organisation for Economic Co-operation and Development (2022) estimated a 4.7% mean reduction of the global GDP for 2020 with respect to 2019, with an average decrease of 5.9% in Europe with countries like Italy that marked an 8.9% decline. Even today, policymakers struggle to maintain a balance between the implementation of restrictions to prevent the virus diffusion, and the undaunted maintenance of economic activities to save jobs and people livelihoods. As of 2022, economies are currently recovering from the initial impact of the pandemic, with most industries slowly coming back to their pre-pandemic levels, thanks to a higher knowledge about the virus, higher medical devices supply, and the advent of vaccines that deeply reduced the transmission and mortality rate of the virus, leading to a feasible coexistence with the virus.

It needs to be highlighted that this pandemic crisis presents several differences with respect to the previous ones like the Great Financial Crisis of 2008 or the Dotcom Bubble Burst of 2000. For example, the impact of the COVID-19 disrupted almost instantaneously the whole world, affecting the supply of production and demand side contemporarily, due to lockdowns and social distancing policies, differently to the GFC that started with the burst of the housing bubble in the U.S. and then involved the demand through wealth effects. Also, the effect of the pandemic shock has been of high magnitude but short, allowing a faster recovery of the real GDP with respect to the GFC that instead had a lower impact that lasted longer. Lastly, as Shibata (2021) noted, during the pandemic crisis social jobs fell more while teleworkable and essential jobs fell less with respect to the GFC, with a large fraction of unemployed persons being placed in layoff.

3.2. Venture Capital and Financial Crises

Financial crises introduce shocks, e.g., liquidity supply, that alter the normal conditions in which VCs operate, greatly increasing uncertainty. Venture capitalist investments are highly dependent on the market conditions, increasing when market signals are more favourable and decreasing during recessions (Block & Sandner, 2009; Gompers et al., 2005). As example, studying the global financial crisis of 2008 Block et al. (2012) detected a decrease in number of funding rounds, especially with early-stage ventures, and a general slowdown of the VC activity, in accordance with Ning et al. (2015) that showed similar results also highlighting a shift of investments from early-stage to late-stage ventures, and a reduction of cash injected in the initial rounds of financing. Block & Sandner (2009) identified three main consequences on VC financing due to crises: first, a decrease in the supply of money to finance VC funds as investors decrease their investments in risky assets due to the higher uncertainty, also accounting for the fact that typical investors are banks or pension funds that are usually severely impacted by crises, in accordance with the finding of Block et al. (2012); second, investment exit problems due to a decline in stock prices and lower activity of IPOs and acquisitions; third, a potential lower valuation of portfolio firms due to lower revenues generated given by a minor propensity of customers to spend.

Due to the higher risks, VC firms also tend to focus/allocate more resources to start-ups operating in their reference sector, as they are more experienced and prepared to react to uncertainties, rather than diversify in different sectors (Conti et al., 2019). Coherently, Bernstein et al. (2019) showed that PE firms, thus including VC ones, focus more on their portfolio firms, increasing the time spent working with them and the likelihood to commit additional funds, engaging in fewer new deals.

3.3. Venture Capital and the COVID-19 Crisis

Recent evidence of the COVID-19 pandemic impact on VC investments seems to be in line with previous literature regarding how VCs behave during crises. However, literature needs to be addressed critically, as the pandemic and governments responses are in current evolution and transformation therefore studies based on data taken from the first months of the pandemic depict a different reality with respect to studies based on more recent data.

Bellavitis et al. (2021) analyzed the pandemic in its initial phase, using data up to July 2020, addressing its impact from five different perspectives: 1) *portfolio firm uncertainty*, showing a positive correlation between the number of COVID-19 cases and the fact that VC investors are less likely to invest in seed-stage ventures but more likely to invest in late-stage ones, coherently with the fact that the pandemic increases uncertainty, making seed-stage venture investments too risky; 2) *foreign country uncertainty*, showing that the higher the number of COVID-19 cases the more VC investors decreases international investment, favoring national ones, due to the fact that VCs have more proficiency in domestic markets than foreign ones; 3) *industry uncertainty*, showing that VC investors are less likely to invest in ventures in the travel industry, as it is one of the industry more penalized due to lockdowns and mobility restrictions; 4) *syndicated investment*, showing a positive correlation between the worsening of the pandemic conditions and the involvement in syndicated investment, as VC investors prefer to share the risks associated to the investment rather than take it by themselves investing alone; 5) *moderating effect of investor prominence*, showing that prominent investors present an higher reduction in seed-stage investments and international investments with respect to other VCs as they behave conservatively.

Also Gompers et al. (2021) conducted a survey over a sample of more than one thousand VCs, to address potential impacts of the pandemic on the VC process, using data collected on the month of June 2020, a moment in which the pandemic was slowing down, and the world was starting to live together with the virus without the need of severe lockdowns, and June 2021 were the world properly adapted to the coexistence with the virus. The study detected almost a 30% reduction in the normal investment pace in June 2020, and a reduction of only 6% as of the month of June 2021, with no differences due to firms' geographic location, confirming the international impact of the pandemic. The most affected investors are the one targeting the IT industry and, surprisingly, late-stage ventures, showing as the main reason the difficulty to evaluate deals. The one-year difference shows how the VC market is slowly recovering from the initial shock. Regarding the deal structure, required IRR remained, surprisingly, constant at 32% for both June 2020 and June 2021 surveys, showing that risk pricing has not affected the cost of capital supply. Regarding the contract terms in June 2020 half of surveyed VCs expected more investor-friendly contract terms, but they resulted more founder-friendly with respect to 2016 data. A decrease in the frequency of participation, redemption, full-ratchet anti-dilution, and high-liquidation preferences is

present indicating a shift in those 5 years towards founder-friendly contract terms, that even the pandemic has still not reverted toward the investor-friendly level of 2016. **Table 4** shows the frequency of terms used by VCs as of June 2020.

Table 4

Frequency of Term Use in Contracts – June 2020

Frequency of Term Use	%
Participation	45
Redemption rights	26
> 1x liquidation preference	26
Full-ratchet anti-dilution	22
Other special investor rights	21
Cumulative dividends	17
≥ 2x liquidation preference	8

Note. From (Gompers et al., 2021).

By June 2021 though, only 14% of VCs reported that terms became more investor-friendly. For what pertains startups' valuation, in June 2020 VCs expected a decline of around 20%, reflecting worsening prospects, but as of June 2021 round valuations actually increased by 3%. Also, addressing the impact of the pandemic on the VCs' portfolio companies, on June 2020 VCs reported that 52% of their companies was unaffected or positively affected, 38% negatively affected but ok, and 10% very negatively affected, indicating the healthcare companies less likely to be severely negatively affected with respect to IT ones. By June 2021 instead, the negative impact of the pandemic severely decreased, with VCs showing that 70% (+18% with respect to 2020) of their portfolio companies were not affected or positively affected, 24% (-14%) negatively affected but ok and only 6% (-4%) to be very negatively affected. Additionally, optimistic prospects on investment returns impact were expected in 2020, with an average expected reduction of IRRs of just 1.6% and cash-on-cash multiples by 0.07, alongside the conviction of 91% of IVCs to outperform the stock market. Confirming the recovery of the VC market, as of June 2021 the average reported increase in IRR was 2.9% and cash-on-cash multiple of 0.58, showing, in reality, a positive impact of the pandemic on valuations, with 93% of IVCs expecting to outperform the stock market. Furthermore, during the survey of June 2021 the most important factor for a venture success was asked, results are reported on **Table 5**.

Table 5

Most Important Factor for Portfolio-Company Success During COVID-19 for IVCs

Most Important Factor	%
Team	43
Industry	17
Business Model	10
Technology	10
Timing	7
Market	6
Luck	6

Note. From Gompers et al. (2021).

Comparing to 2016 it is possible to note a decrease in the importance of the team (from 47% to 43%) that remains the most important factor, and an increase in the industry (from 6% to 17%) coherently with the fact that some industries are more impacted by the pandemic than others (e.g., travel vs healthcare). Furthermore, looking at the number of interactions between VC firms and their portfolio companies, in June 2020 half of the respondent firms met with them at least once a week or more frequently, differently to June 2021 where the meeting frequencies dropped with more reported monthly meetings. Coherently, examining the time use of VCs during the pandemic, an average of 18.9 hours per week was spent assisting portfolio companies by VC in July 2020 with a reduction to 17.1 as of June 2021. During the initial period of the pandemic VC spent an average of 58.2 hours per week working, with a reduction to 54.5 after one year, principally reducing meetings with limited partners and the time spent assisting portfolio companies, confirming the higher involvement of VCs during critical periods. Lastly, concerning the types of activities conducted with portfolio companies, a considerable reduction of crisis-related activities has been evidenced from June 2020 to the same month of 2021: help to reduce the burn rate went from being the second common activity, performed by 48% of the sample, to only 19%, connect with COVID-19 relief from 33% to 11%, connect with liquidity from 30% to 22%, and fire employees from 12% to 5%. The most common activity remained the provision of strategic guidance that still decreased from 68% to 57%, with high percentages in the provision of help with operational guidance and the creation of connection, e.g., with customers and investors.

Considering the geography of the investments, while Bellavitis et al. (2021), as previously shown, detected the tendency to prefer national investments over international ones, Han et al. (2021) focused instead on the national/regional level, comparing the year 2019 with 2020 to study the effect of lockdowns on the Chinese VC market, the second-largest in the world. The average firm in the sample faced 108 days of

lockdown. What emerged is that VC firms tend to invest in remote ventures rather than local ones during lockdown periods, with a higher intensity of such effect in areas where there is a better internet infrastructure, when the VC firms are more experienced, and the ventures are in their early stages of development. Surprisingly such effect seems to be persisting even after the end of such restrictions and is the consequence of the emergence of social distancing needs that were answered using remote communication technologies. Furthermore, this effect led to a decrease in the regional inequality of entrepreneurial access to VC financing. Coherently, Gompers et al. (2021) detected that 39% of the surveyed VC firms as June 2021, was more willingly to invest outside their home region due to the COVID-19, particularly the ones focusing on the IT sector and the ones that benefited from the pandemic.

Better looking at the impact of the pandemic on the targeted industries by VCs, it has been evidenced a reallocation effect that started right before the declaration of pandemic status by WHO on March with a global level shift in pandemic-related investments, that also became significant at a country level after the declaration itself (Bellucci et al., 2020), in accordance with the previously shown finding of Bellavitis et al. (2021) that highlighted a decrease in the investments in the travel industry, and Gompers et al. (2021) that detected a higher importance given by VCs on the industry when investing in a venture. Furthermore, more experienced VCs invested higher amounts and increased the number of pandemic-related deals with respect to young and inexperienced VCs (Bellucci et al., 2020). In addition, Ezangina & Malovichko (2021) other than the sectorial redistribution of investments in favour of pandemic-related sectors, also detected a market polarisation with respect to the pandemic, i.e., covid-negative, covid-positive, covid-neutral.

For what pertain the IPO market, Baig & Chen (2021) analysing the whole 2020 detected an incredible expansion, despite the severe negative effects of the pandemic, with an increase in the number of IPOs with respect to previous years, mostly in the second semester, and more than $150 billion raised by new firms during the whole year. This increase has been driven by firms related to "hot markets", i.e., high-technology and healthcare, maybe due to the overvaluation of such markets or capital constraints given by the pandemic. Also, an adverse impact on the IPO market was detected due to higher IPOs underpricing and more post-IPO return volatility with respect to non-pandemic periods, with a positive correlation between the pandemic intensity and government restrictions and IPO underpricing and volatility.

4. Methodology

This chapter covers the introduction of the research methodology used for the study. At first, a description of the survey design through which data has been collected and managed is presented, then the summary statistics and the methodology applied to conduct the analysis are explained.

4.1. Design

As this study tries to address the impact of the COVID-19 crisis over venture capital investment strategies, a survey has been designed with the aim to obtain both VCs managerial practices and their behavioural changes in a pre and post COVID-19 scenario, taking as reference existing related literature such as the work of Gompers et al. (2020).

The survey, that has an average duration of 15-20 minutes, is comprised of three different sections:

A. *Personal information*. It consists of questions related to the respondent's demographic information like the name and surname, the email, and the current location, with some other optional questions like the gender. Also, respondents are asked the typology of firm they work for, that is, independent VC, captive VC, or any other type of Private Equity form, to filter out non-VCs from the survey that in fact, after being asked their specific PE typology, conclude the survey. Furthermore, an additional question is shown in case of captive VC to understand its typology. Note that all the data have been treated confidentially and used at an aggregate level to exclude the possibility to infer any specific respondent's answers.

B. *General VC fund related information*. This second section comprises questions related to the VC fund of the respondent. The name, number of workers, vintage year, size, number of portfolio companies of the fund, and the respondent job title is asked. Also, to better characterize the fund, the investments' geographic focus (domestic/international) is asked along with whether the fund has a social impact or not. Lastly, depending on the typology of VC it is asked which are the most relevant LPs in case of an independent VC, or the parent company and its targeted industries in case of captive VC.

C. *Investment practices and COVID-19 crisis*. The focus of this last section, core of the survey, is to understand the investment practices during the VC cycle both before and after the COVID-19 crisis. For this purpose, most of the questions have been structured in a pre-crisis and post-crisis scenario. Initially, general questions like the qualitative impact of the crisis or the stage, industry, and geographic target are asked. Then the section is divided into five subsections that go deeper into each specific investment practice: deal origination and selection, valuation, deal structuring, post investment and exit, syndication. The first four represent the VC investment steps while

syndication is a general practice used by VCs while investing. A total of 31/33 questions are asked, depending on whether the fund does cross-border investments and has a social impact.

The survey has been designed and distributed via email using Qualtrics, but prior to the actual distribution, a draft version was circulated among a few Italian based venture capitalists of different VC firms, to receive feedback and address potential problems and misinterpretations. The mailing list has been taken from a Preqin database, updated as of March 2021, where more than 50.000 private equity investors being part of around 7.000 VC/PE firms around the globe are included. Several pieces of information are available for each investor, including their full name, the name of the firm they work for and, obviously, their professional email address. Although some information in the database was found to be out of date, it nevertheless served as a basis for reaching this large number of industry professionals. Also, as the database doesn't concern only VCs, respondents were asked to identify themselves to filter out PE investors, as they are outside the scope of the study. The survey was sent in 8 different waves that started in mid-May 2021 and ended in mid-November 2021, incentivising responses through the promise to deliver a report with the final analysis of the survey along with the possibility to attend a future event about the results. Specifically, during the second wave a very low response rate was detected, for this reason the message presenting the survey in the email body has been adjusted, leading to a notable improvement in the response rate right from the third wave. In the end, over a total of 7121 firms present in the database, 1171 total responses were received, of which only 704 declared to be VC firms (see **Table 6**).

Table 6

Survey Responses

	Respondents	
	N	%
Total responses	1171	100
No Venture Capital	467	39.9
Private Equity Fund	208	44.5
Fund of Fund	43	9.2
Family Office	15	3.2
Individual Angel Investor	25	5.35
Other	176	37.7
Venture Capital	704	60.1

On these 704 answers, data management activities have been carried out. Firstly, the dataset has been cleaned by removing all the incomplete answers that didn't reach the 75% of completion, reducing the number to 532 (around 25% or reduction); then a consistency analysis has been conducted, adjusting, if possible, inconsistencies between the different records to eliminate potential outliers that could've biased the sample, reducing the sample to 506 (5% of reduction). For example, if from the same VC fund there were multiple answers, the one from the respondent with the higher seniority inside the firm or the most coherent with the sample has been selected, discarding the others. Also, the reliability of the answers has been checked through a matching with the Preqin database.

Lastly, concerning potential issues affecting the sample, this study may be subject to introspection and rationalization biases since an ex-post collection method has been used, i.e., after the events occurred. For this reason, while answering, respondents may have changed their objective response with one that has been rationalized and modified by their personal view. A second potential issue is the bias of the sample toward more successful VCs as poorly performing or failed ones were less likely to fill out the survey. Another concern may be that the sample of respondents adopted in the study may not be representative of the whole VC industry.

4.2. Summary Statistics

In this paragraph the summary statistics of the sample, used to contextualize the following analysis, are provided. Initially, there is a focus on the typology of VC funds and their geographic origins, then a description at respondents and funds-level is conducted.

Out of the 506 VC funds included in the sample, 92.69% (n=469) are independent VCs while 7.31% (n=37) are captive, of which around 40% are governmental, 35% corporate and 24.3% bank-controlled.

Table 7

Respondent at VC Funds

	Respondents	
	N	%
VC Funds	506	100
Independent VC Funds	469	92.7
Captive VC Funds	37	7.3
Bank-controlled VC Fund	9	24.3
Governmental VC Fund	15	40.5
Corporate VC Fund	13	35.1

Almost half of the sample, precisely the 45.26%, is composed by European VCs, this is because as the study originates from Italy, it induced a higher response rate in the area thanks to ties and connections. Almost one third of the sample, the 29.45%, is instead composed by North American VCs, being their belonging area the widest in the VC market. The overall geographic distribution of the sample is shown in **Table 8**.

Table 8

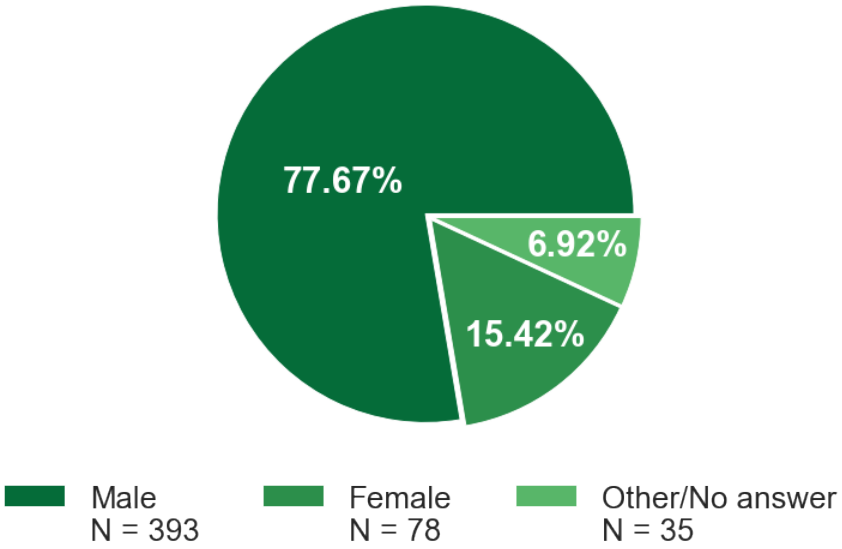
Geographic Distribution of VCs

Country	N	%
Europe	229	45.26
North America	149	29.45
South America	83	16.40
Asia	22	4.35
Africa	18	3.56
Oceania	5	0.99
Total Answers	506	100

Concerning the respondents' characteristics, 77.67% (n=393) of the sample is composed of male VCs, 15.42% (n=78) of female VCs and the remaining 6.92% (n=35) indicated themselves as other or decided not to answer (see **Figure 10**), highlighting that the VC industry is still lacking a proper gender balance within its players, with male VCs clearly outnumbering the others.

Figure 10

Gender of the VCs



Looking instead at the age distribution of the sample, shown in **Table 9**, it is possible to observe that on average male VCs are 7 years older than female ones. Note that this question was an optional one, in fact the statistic is based on only 68.77% (n=348) of the overall sample.

Table 9

Age of VCs

Age	N	Mean	Pct 25	Median	Pct 75	Std dev
Overall	348	49.14	41	50	57	11.87
Male	293	50.22	42	51	58	11.60
Female	52	43.44	33	43	52	11.89

Concerning the job title of the respondent VCs, shown in **Table 10**, almost half of the sample is composed by managing partners (42.49%), followed by general partners (16.01%), and principals/associates along with partners/venture partners (around 10.5%).

Table 10

VCs' Job Title

Job Title	N	%
Managing Partner	215	42.49
General Partner	81	16.01
Principal/Associate	54	10.67
Partner/Venture Partner	53	10.47
Executive	43	8.50
Senior Partner	21	4.15
Analyst	8	1.58
Other	8	1.58
CEO	7	1.38
Staff	6	1.19
BoD	5	0.99
Founder	5	0.99
Total Answers	506	100

It is also interesting to inspect the interaction between the gender and age of the respondents, as shown in **Table 11** in which also the relative percentage of each job with respect to the gender is displayed. The most common role for both genders is the managing partner, with several differences across the two samples. Furthermore, it seems that female VCs are more likely to be executive, principal/associate, analyst, and part of the staff with respect to males that on the contrary are more likely to be managing partner, general partner, partner/venture partner, senior partner, CEO and founder.

Table 11

VCs' Job Title with respect to Gender

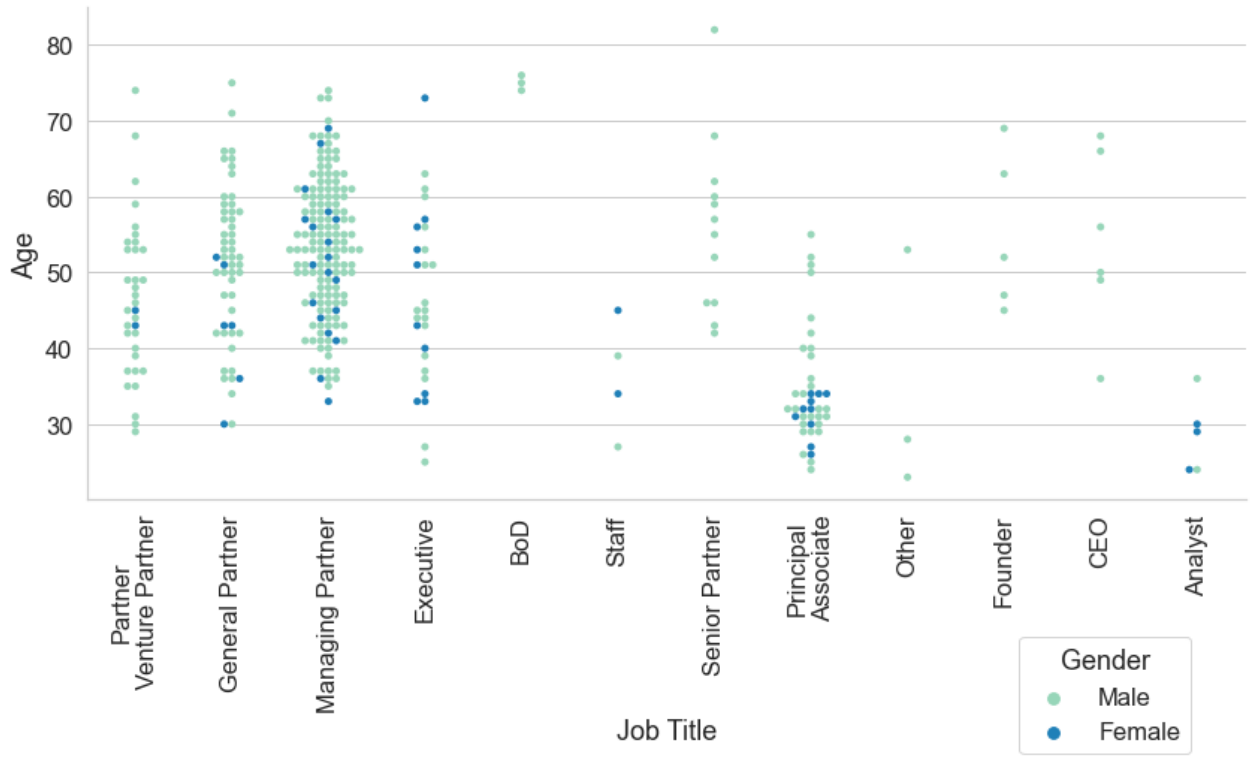
Job Title	Male	Female	%Male	%Female
Managing Partner	177	29	45.04	37.18
General Partner	66	8	16.79	10.26
Principal/Associate	35	13	8.91	16.67
Partner/Venture Partner	45	2	11.45	2.56
Executive	23	17	5.85	21.79
Senior Partner	19	0	4.83	0
Analyst	3	5	0.76	6.41
Other	7	0	1.78	0
CEO	7	0	1.78	0
Staff	2	3	0.51	3.85
BoD	4	1	1.02	1.28
Founder	5	0	1.27	0
Total Answers	393	78	100	100

Note. %Male represents the relative percentage of the job with respect to Male's jobs, the same applies to %Female.

Analysing the age with respect to both the job title and gender, as shown in **Figure 11**, it is also possible to observe that analyst, staff and principal/associate positions are on average younger than the others, the BoD role is covered by old men, and women that takes the partner/venture partner and general partner positions are younger than men in the same categories, with the general partner one being on average older than the partner/venture partner.

Figure 11

Cross-relation Between the Age, Gender, and Job Title of the VCs



Focusing on the fund's characteristics, show in **Table 12**, the average vintage year of the funds in the sample is 2015, with a median of 2017; the average size in M$ is 211, with a median of 100 million $; the average number of portfolio companies is 42.5 with a median of 15; and the average number of workers in the funds are 11 with a median of 7. As noticeable, the distributions are skewed and they present very high standard deviations, this is due to some registered answers that differ substantially from the rest of the sample, therefore shifting the distributions. Potentially, such answers may be very big funds compared to the others or they may even be mere reporting errors, but since the exactness was not verifiable, they were not removed from the sample.

Table 12

Fund's Characteristics

Fund	N	Mean	Pct 25	Median	Pct 75	Std dev
Vintage Year	499	2015	2014	2017	2019	6.72
Size [M$]	506	211.15	47	100	250	260.80
# Portfolio Companies	506	42.5	8	15	75	188.1
# Workers	506	11.14	5	7	12	17.07

It is also important to understand the influences behind the funds, observing the type of ownership of captive VCs and the relevant limited partners of independent VCs. Starting from the latter, **Table 13** shows that individuals are widely the most important type of limited partners, in fact around 63% of independent VCs gave them importance. Very important are also governments and investment funds selected by around 41-42% of the sample, followed by corporate and pension funds, that are important for around one third of the VCs. Concerning captive VCs, as already shown in **Table 7**, 40.5% have as parent company a government, 35.1% a corporation and 24.3% a bank. Going deeper, shows the type of industries in which the parent company, in case of corporate VC, operates, and although the sample has a very small size (n=13), the telecommunication industry seems to be the preferred one by almost 40% of the sample.

Table 13

Relevant Limited Partners for Independent VCs

Limited Partner	N	%IVC
Individuals	296	63.11
Governments	198	42.22
Investment Funds	193	41.15
Corporate	168	35.82
Pension Funds	143	30.49
Banks	99	21.11
Insurance	97	20.68
Foundations Family Offices	55	11.73
Other	5	1.07
Total IVC	469	100

Table 14

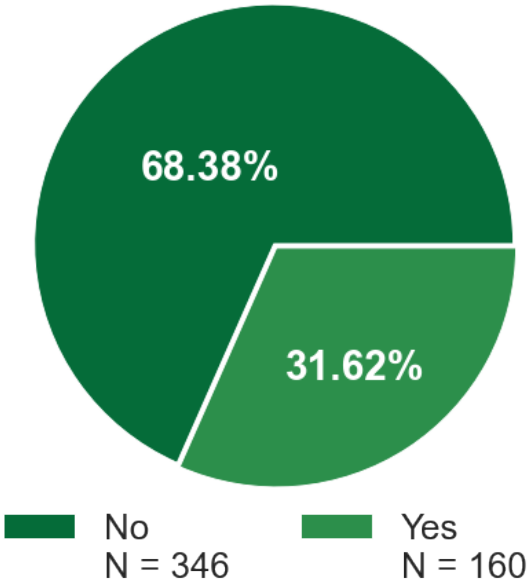
Corporate VCs' Parent Industry

Industry	N	%CVC
Telecommunications	5	38.46
Consumer Products/Services	4	30.77
Agriculture	4	30.77
Chemicals Pharmaceuticals	4	30.77
Biotechnology	4	30.77
Energy Environment	4	30.77
Healthcare	4	30.77
Industrial Technology/Manufacturing Semiconductors	4	30.77
Electronics Instrumentation	3	23.08
Data/Software Services	3	23.08
Internet Mobile Services	2	15.38
Education	2	15.38
Retailing Distribution	1	7.69
Media Entertainment	1	7.69
Microfinance/Insurance Financial Services	1	7.69
Fintech	1	7.69
Other	1	7.69
Total CVC	13	100

Concluding, to also have a broader view on the funds' objectives, it has been asked if the fund has a social impact, i.e., it deliberately invests in businesses that are expected to generate economic, environmental, and social value. Only around 32% of the VCs in the sample pursue such objectives, as shown in **Figure 12**, indicating that the VCs industry is still not focused on such themes even if ESG investments are becoming more and more popular.

Figure 12

Social Impact Funds in the Sample



4.3. Analysis Description

For the purpose of the study, different subgroups have been created to visualise and analyse the different investment practices and effects of the COVID-19 pandemic:

1. **Type**: A division between independent (IVC) and captive (CVC), following the previous shown distribution.
2. **COVID Impact**: Following the answers given by VCs to a question where it was asked the percentage of their portfolio companies that have been positively, negatively, and severely negatively affected by the pandemic, a distinction between a "Positive" and "Negative" category will be created. All those who answered to have at least 50% (included) of their companies positively affected or not affected have been included in the "Positive" category (n=293) while the ones that answered to have less than 50% have been included in the "Negative" category (n=173).
3. **Stage**: All the VCs that answered to target both before and after the pandemic only seed and early-stage ventures has been included in the "Early" category (n=248) while the ones that in the same period targeted only mid and late-stage ventures has been included in the "Late" category (n=105).

4. **Internationalization**: All the funds which declared to do only domestic investments have been included in the "Domestic" category (n=193) while the ones that do only cross-border investments have been included in the "Cross-Border" one (n=122).
5. **Target IRR**: All the VC funds that targeted an IRR below or equal the median both before and after the pandemic have been included in the "Low" category (n=319), while the ones above the median have been included in the "High" category (n=148). Note that the median of the distribution of targeted IRR before and after the pandemic is equal in both cases, i.e., 20-29%.
6. **IPO Rate**: In the survey it has been asked the frequency in which the funds experienced exits through an IPO. All the funds that declared an above average frequency both before and after the pandemic have been included in the "High" category (n=81), while the ones that declared an average or below average frequency have been included in the "Low" category (n=193). This category has been created to assess the influence of reputation, that according to existing literature is associated with a history of successful exits through IPO.
7. **Fund Size**: According to the declared fund size in millions of dollars, a "Small" category (n=259) that contains all the funds with a value below or equal to the median value of the distribution (100 M$) has been created along with a "Large" category (n=247) that contains the funds with a size above the median.
8. **Location**: Depending on the location of the funds, the "EU" (n=229) and "Rest" (n=277), i.e., the rest of the world, categories have been created.

Although an additional division depending on the type of industry would've been interesting to observe, the resulting independent samples resulted in a very small size leading to potentially misleading statistics that in fact have been ignored.

Additionally, for those questions where it was possible to compare the pre- and post-COVID-19 scenario, some inferential statistical tests have been utilized, to validate eventual heterogeneities also from a statistical point of view. Specifically, the following tests have been applied:

- **Wilcoxon signed-rank test**: Used for questions based on a ranking from 1 to 5, it is a non-parametric test used to verify whether two related paired samples come from the same distribution or not. In particular, it tests whether the distribution of the differences x - y is symmetric about zero. In our case rejecting the null hypothesis would imply that there is a difference in how VCs associated importance to an examined factor within the pre- and post-pandemic scenario. Differently from the original test, in case of ties the normal approximation used follows the procedure introduced by Cureton (1967), i.e., it includes zero-differences in the ranking process, but drops the ranks of the zeros.

The test in based on three assumptions that are verified prior to its usage: 1) the dependent variable should be measured at the ordinal or continuous level; 2) the independent variable should consist of two categorical "matched pairs", i.e., from the same respondent; 3) the distribution of the differences between the two related groups needs to be symmetrical in shape. The first two assumptions are always verified due to how the variables have been organized, the last one should be instead tested for each case.

- **McNemar test:** Used for questions where only the factor relative frequency is present, it is a non-parametric test for paired nominal data used to verify if the proportions of categories in two related groups differ from each other. In our case rejecting the null hypothesis would imply that there is a difference in proportion in how the analysed factor is distributed in a pre- and post-COVID-19 scenario. To conduct such a test a contingency table for the analysed factor, as shown in **Figure 13**, must be created.

Figure 13

Example of Contingency Table

		Post	
		Selected	Not Selected
Pre	Selected	a	b
	Not Selected	c	d

Additionally, in case the diagonal (b+c) was less than 10, as the test is based on a chi-squared distribution that loses validity in such a condition, a correction using the binomial distribution was applied (called “exact” test).

The test is based on three assumptions that in our case are always true: 1) the data for each group come from a simple random sample; 2) the two groups consist of data from the same group observed at multiple points in time; 3) the two groups of your categorical variable should be mutually exclusive.

- **Paired t-test**: Used for questions with a continuous distribution, it is used to test whether the mean difference between pairs of measurements is zero or not. In our case rejecting the null hypothesis would imply that the mean between the pre- and post-COVID-19 scenario is different. The test is based on three assumptions that are always verified: 1) observations are independent; 2) each of the paired measurements is obtained from the same subject; 3) the dependent variable is normally distributed.

The tests have been conducted using Python with the help of the library *pandas* to manage and organize all the data, *scipy* for the Wilcoxon signed-rank test and the paired t-test, and the library *statsmodels* for the McNemar test. Concluding, all the tests have been conducted only at a general level, i.e., considering the whole sample ("all" category in the tables), and a 5% significance level has been considered.

5. Impact of the COVID-19 on Investment Strategies

In this chapter the results of the study are shown, describing in detail the impact of the COVID-19 on VC investment practices. Initially the general structural changes are addressed, then the focus is shifted toward a more in-depth analysis of each step of the VC investment process. Note that the survey was structured in a way to assess the impact of the pandemic on VC investment practices both from a qualitative and quantitative point of view.

5.1. Structural Changes

Structural changes refer to the adjustments done by the VCs as a consequence of the pandemic impact from a structural perspective. At first, it was asked if there was a change in investment strategies after the COVID-19 outbreak. Almost half of the VCs in the sample reported no change in their investment strategies (48.4%), with a similar percentage (46.8%) that instead had a moderate change and only a very small part (4.7%) that significantly changed them, as shown in **Table 15**. Logically, VCs negatively impacted by the pandemic reported a higher frequency in significant strategy changes, almost 4 times more, with respect to VCs that were instead positively affected. The most significant difference is noticeable instead from the geographic location of the VC fund, with around 57% of the European funds that reported no changes with respect to only 41% of the non-EU funds that did the same, with the latter that changed strategies in a moderate and significant level way more than EU funds. This difference may be the result of different factors that need to be addressed critically, like for example the different severity level of the pandemic impact across the globe, and the different governments' responses. Also, late-stage VCs changed more but in a moderate way their strategies with respect to early-stage VCs, that instead changed less but in a more significant way, probably due to the higher uncertainty given by the pandemic crisis. Concluding, VCs with a high IPO rate changed less their strategies with respect to the ones with a lower rate, confirming the fact that more reputable VCs are more capable to react to crises and time the market.

Table 15

Change in Investment Strategies

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No Change	48.4	48.2	51.4	50.2	45.6	48.8	45.7	49.2	47.5	50.3	45.3	50.3	55.6	49.8	47.0	57.2	41.2
Moderate	46.8	46.7	48.6	47.1	44.0	46.0	53.3	46.1	46.7	46.3	51.6	47.2	39.5	44.8	49.0	40.6	52.0
Significant	4.7	5.1	0.0	2.7	10.4	5.2	1.0	4.7	5.7	3.3	3.1	2.6	4.9	5.4	4.0	2.2	6.9
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Analysing the time to complete a deal after the COVID-19 outbreak, as shown in **Table 16**, half of the respondent VCs reported no changes (49.8%), almost one third instead had an increase in the time required (32.6%) while less than one over five experienced a decrease (17.6%), showing a tendency towards a higher overall time to deal. Again, VCs with most of their portfolio companies that suffered a negative impact are the ones that reported a higher time to deal, with an overall increase, with respect to the period prior to the pandemic, for a net of almost 43% of them (calculated subtracting who experienced an increase to the ones that experienced a decrease), a very high percentage compared to VCs that profited thanks to the pandemic for which the impact has been marginal (net increase in time for 6% of the sample). VCs targeting late-stage ventures also witnessed an overall increase in their time to deal, while early-stage VCs seem to have perceived almost no overall difference (net increase for 29.6% of the sample vs 6.4%), probably since during crises late-stage companies are more susceptible and less flexible with respect to early-stage ones. More reputable VC funds also seem to have increased their overall time to deal, even in a higher percentage with respect to less reputable one (net increase for 27.1% vs 10.9%). A surprising result is instead that funds targeting high IRR seem to have benefitted by the pandemic, experiencing lower time to deal with respect to the period prior to the virus outbreak.

Table 16

Time to Deal

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No Change	49.8	49.0	59.5	54.9	37.6	52.4	43.8	49.2	50.8	49.7	52.3	53.9	45.7	51.0	48.6	52.4	47.7
Increased	32.6	33.0	27.0	25.9	52.8	27.0	42.9	34.2	29.5	35.3	21.9	28.5	40.7	34.0	31.2	31.4	33.6
Decreased	17.6	17.9	13.5	19.1	9.6	20.6	13.3	16.6	19.7	15.0	25.8	17.6	13.6	15.1	20.2	16.2	18.8
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

As previously shown, during crises, even the COVID-19 one, VCs tend to prefer investments in mid and late-stage ventures due to the higher uncertainty (Bellavitis et al., 2021; Block et al., 2012). For this reason, VCs were asked their targeted venture stage both before and after the pandemic crisis, highlighting a behaviour that seems to be in line with existing literature. Specifically, looking at the results shown in **Table 17**, it is evident that VCs negatively impacted by the pandemic, differently than the ones that profited thanks to the pandemic, switched from seed and early stages to mid and late ones, confirming that under negative circumstances VCs prefer investments that present lower uncertainty, i.e., they target ventures in later stages. Similarly, captive VCs, differently from IVCs, seem to have followed this same pattern. Overall, a major increase of investments in middle-stage ventures by around 4.3% has been registered, alongside an increase of 1.2% in late and early stages, with a small reduction of 0.2% in seed-stage investments. Additionally, the changes in early, mid, and late stages are statistically significant when

applying a McNemar test (p-value: 3.12%; 0.00%; 3.12%; see **Figure 15** in the appendix for the answers' frequency in detail). Therefore, VCs, specifically the independent ones, seem to also have increased their investment in almost all the stages, probably due to the particularly positive year for the VC market that led to record-breaking levels of investments. It is also interesting to highlight the fact that investments in late-stage ventures abroad seem to be in countertendency, therefore decreasing, and VCs with a high IPO rate are the one that mostly increased their investments in late-stage ventures, most likely since, as evidenced by literature, more reputable VCs act more conservative and risks adverse to preserve their reputational status (Dimov et al., 2007; Petkova et al., 2014). Furthermore, small size funds, differently to the large size ones, decreased investments in early-stage ventures to favour late-stage ones, probably due to their lower capability to handle risks.

Table 17

Targeted Venture Stages

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Seed	53.0	51.8	67.6	55.6	44.8	77.8	-	53.4	52.5	48.3	63.3	53.9	45.7	62.2	43.3	55.0	51.3
	-0.2	+0.2	-5.4	+0.4	-0.8	-0.4	-	-1.6	-2.5	0.0	-0.8	+1.0	+2.4	-2.4	+2.0	+0.5	-0.8
Early	64.2	63.1	78.4	62.8	72.8	74.6	-	58.0	63.1	63.7	65.6	60.1	70.4	66.8	61.5	62.9	65.3
	+1.2	+1.7	-5.4	+2.4	-1.6	+2.0	-	+3.1	+2.5	+0.6	+3.2	+1.6	0.0	0.0	+2.5	+0.4	+1.8
Mid	34.0	32.6	51.4	33.8	36.0	-	41.9	29.0	34.4	35.7	32.0	32.1	51.9	26.6	41.7	32.8	35.0
	+4.3	+3.6	+13.5	+5.1	+4.0	-	+4.8	+4.7	+3.3	+4.3	+5.5	+2.1	+1.2	+4.7	+4.0	+3.0	+5.4
Late	34.2	34.1	35.1	35.5	30.4	-	92.4	30.1	37.7	39.0	24.2	38.9	39.5	19.7	49.4	38.4	30.7
	+1.2	+0.9	+5.4	-0.3	+4.0	-	+0.9	+1.0	-0.8	+1.0	0.0	-0.6	+6.2	+1.5	+0.8	+0.9	+1.4
All Stages	7.9	7.5	13.5	9.2	5.6	-	-	3.6	9.0	7.3	8.6	7.3	16.0	5.4	10.5	8.3	7.6
	+0.8	+0.8	0.0	+1.4	0.0	-	-	+0.5	0.0	+0.7	+0.8	+0.5	+2.5	0.0	+1.6	+0.4	+1.1
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

Analysing the targeted industries by VCs, shown in **Table 18**, a switch in the most targeted industry is noticeable, as prior to the pandemic the data and software services industry was the preferred one (39.1%), while after the pandemic outbreak the healthcare industry took the lead (almost 40%). Coherently with the sector polarization identified by Ezangina & Malovichko (2021), and the shift in pandemic-related investments highlighted by Bellucci et al. (2020), investments in the healthcare sector are the ones that increased the most (+2.4%), while the ones targeting the most affected industries like retailing/distribution and data/software services were the one that decreased the most. Additionally, applying a McNemar test (see **Figure 16** in the appendix for the answers' frequency in detail), the changes in those three categories are the only ones, among all the different industries, to result statistically significant (p-value: Healthcare 0.15%; Retailing/Distribution 0.78%; Data/Software services: 1.56%).

Following the findings of Gompers et al. (2021), an increase in the importance given by VCs on the targeted industry is also present ("no specific target" decreased), even if not statistically significant, but it is interesting to note that this effect is only present in VCs positively affected by the pandemic, while it is not the case for VCs that suffered a negative impact. Additionally, VCs positively affected increased their investment in industrial technology/manufacturing and energy & environment differently than the negatively affected one that decreased them. Considering the targeted venture stage, early-stage VCs behaved similarly to the late-stage ones, with few exceptions like in the energy & environment industry that increased for early-stage but decreased for the late one and the microfinance/insurance & financial services industries that decreased for early-stage and increased for late-stage. Looking across geographic targets, it is observable that VCs investing only in a domestic context increased their investments in the healthcare sector, differently to the ones doing cross-border investments that actually decreased investments in such type of industry, with a similar trend noticeable in the education, biotechnology and fintech sectors.

Going further, contrary to the findings of Bellavitis et al. (2021), around 86% of the respondents that targeted cross-border investments prior to the pandemic, didn't shift their focus toward domestic investments after the COVID-19 outbreak, as shown in **Table 19**, with a substantial consensus across the different subgroups analysed. Only around 9% of the sample switched to domestic investments, with above-average percentages in VCs negatively affected by the pandemic, VCs located outside of EU and VCs with a higher reputation.

Table 18

Targeted Industries

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No Specific Target	21.9	21.1	32.4	22.9	20.0	25.8	27.6	24.4	14.8	21.7	21.9	25.9	11.1	24.3	19.4	24.9	19.5
	-0.4	-0.4	0.0	-0.7	+0.8	-0.8	-0.9	-2.1	0.0	-0.4	0.0	-1.5	+1.2	-1.1	+0.4	+0.4	-1.1
Telecommunications	27.1	26.4	35.1	32.4	20.0	27.0	27.6	26.9	23.0	26.3	30.5	31.1	27.2	23.6	30.8	30.1	24.5
	+0.2	+0.5	-2.7	-1.0	+0.8	+0.8	0.0	-0.5	+3.2	+0.4	+1.5	-0.5	+4.9	0.0	+0.4	+0.9	-0.3
Internet & Mobile Services	26.1	25.8	29.7	29.0	23.2	25.4	21.9	23.3	23.8	24.0	28.1	31.1	23.5	23.6	28.7	24.5	27.4
	-1.0	-0.6	-5.4	-1.4	-0.8	-0.8	0.0	-1.5	-1.7	0.0	-1.5	-1.0	0.0	-2.8	+0.9	0.0	-1.8
Data,Software Services	39.1	39.2	37.8	45.1	30.4	41.1	35.2	39.9	35.2	38.7	43.0	41.5	43.2	37.5	40.9	41.9	36.8
	-1.4	-1.2	-2.7	-1.4	-1.6	0.0	-2.8	0.0	-2.4	-0.7	+0.8	-1.1	-2.5	-0.4	-2.4	-0.4	-2.1
Media & Entertainment	10.3	10.2	10.8	11.3	8.0	9.3	6.7	9.3	8.2	9.0	10.2	13.0	12.3	6.9	13.8	10.5	10.1
	-0.2	0.0	-2.7	-0.7	+0.8	+0.8	-1.9	+1.6	-1.6	0.0	-0.8	-1.1	-2.4	+0.4	-0.8	-1.8	+1.1
Semiconductors	7.7	6.8	18.9	8.9	4.0	7.7	7.6	7.8	8.2	5.7	9.4	9.8	6.2	5.8	9.7	9.6	6.1
	+0.6	+0.7	0.0	+0.7	+0.8	+0.4	+1.0	0.0	+0.8	0.0	+1.5	0.0	0.0	+0.8	+0.4	+0.4	+0.8
Industrial Technology & Industrial Manufacturing	20.4	19.4	32.4	20.5	22.4	16.9	27.6	22.3	18.0	20.7	22.7	22.8	16.0	18.1	22.7	23.1	18.1
	+0.5	+0.9	-2.7	+2.0	-3.2	0.0	-0.9	+1.5	-0.8	0.0	0.0	-1.0	+5.0	+0.8	+0.4	+0.5	+0.7
Electronics/Instrumentation	7.3	6.4	18.9	6.8	8.0	5.6	10.5	9.3	5.7	7.3	7.0	10.4	6.2	6.6	8.1	8.7	6.1
	+0.4	+0.4	0.0	+1.0	-1.6	0.0	0.0	+1.1	+0.9	+0.7	0.0	-1.1	+2.4	+0.3	+0.4	+0.9	0.0
Retailing/Distribution	11.3	11.3	10.8	10.9	12.8	8.9	11.4	10.9	12.3	12.7	8.6	12.4	7.4	12.7	9.7	11.4	11.2
	-1.6	-1.5	-2.7	-0.3	-3.2	-0.8	-0.9	-1.6	0.0	-2.0	-0.8	-2.0	+1.2	-2.3	-0.8	-0.9	-2.2
Consumer Products and Services	19.4	19.2	21.6	21.5	19.2	14.9	24.8	19.7	18.0	19.7	14.1	18.1	17.3	18.1	20.6	15.7	22.4
	-0.2	-0.2	0.0	-0.3	0.0	0.0	0.0	+0.5	0.0	-1.0	+2.3	-0.5	0.0	-1.9	+1.7	0.0	-0.4
Healthcare	37.5	38.0	32.4	36.9	40.0	34.3	33.3	43.0	30.3	37.0	38.3	37.3	40.7	39.0	36.0	31.0	43.0
	+2.4	+2.1	+5.4	+2.3	+2.4	+3.6	+2.9	+4.7	-0.8	+2.0	+0.8	+3.1	0.0	+1.5	+3.3	+3.9	+1.0
Energy & Environment	19.2	18.8	24.3	16.7	25.6	16.9	20.0	21.2	21.3	20.7	18.0	19.2	17.3	18.9	19.4	19.7	18.8
	+1.0	+0.8	+2.7	+2.4	-1.6	+2.5	-1.0	-0.5	+0.8	+0.6	0.0	0.0	+1.2	+0.4	+1.7	+0.8	+1.1
Biotechnology	22.7	22.8	21.6	21.8	25.6	23.0	13.3	24.4	17.2	22.0	25.0	19.2	37.0	20.1	25.5	17.9	26.7
	+0.2	0.0	+2.7	0.0	0.0	-0.4	0.0	+1.5	-0.8	+1.3	-3.1	+0.5	-1.2	0.0	+0.4	0.0	+0.4
Chemicals & Pharmaceuticals	11.7	11.3	16.2	11.6	14.4	8.9	11.4	13.5	10.7	12.0	14.1	11.9	13.6	9.3	14.2	9.6	13.4
	+0.9	+0.9	+2.7	+1.4	+0.8	+1.6	+1.0	+1.0	+0.8	+1.3	0.0	-0.5	+3.7	+0.4	+1.6	+1.3	+0.7
Microfinance/Insurance & Financial Services	11.5	11.3	13.5	11.6	12.8	10.5	10.5	8.3	13.1	12.3	10.2	10.9	6.2	10.8	12.1	9.2	13.4
	+1.0	+1.1	0.0	+1.4	+0.8	-0.4	+3.8	+0.5	+0.8	+1.0	+0.7	+1.0	+1.2	+0.4	+1.7	+0.8	+1.0
Fintech	30.6	30.5	32.4	34.8	27.2	33.1	22.9	25.4	34.4	29.7	34.4	28.5	33.3	30.1	31.2	26.2	34.3
	+0.2	+0.4	-2.7	0.0	-0.8	+0.4	-1.0	+2.1	-1.6	+1.0	-0.8	+1.0	-1.2	+0.4	0.0	+0.4	0.0
Agriculture	17.8	17.7	18.9	17.4	20.8	15.7	13.3	17.6	16.4	19.0	13.3	15.5	14.8	20.8	14.6	12.7	22.0
	+0.2	0.0	+2.7	+0.3	-0.8	+1.2	0.0	0.0	-0.8	+0.3	0.0	-0.5	0.0	+0.4	0.0	+0.4	0.0
Education	16.4	16.8	10.8	14.3	20.8	14.1	18.1	15.0	15.6	19.3	10.2	15.0	16.0	17.0	15.8	11.8	20.2
	+0.6	+0.7	0.0	+1.7	-0.8	0.0	0.0	+2.1	-3.3	+0.7	+0.7	+0.5	+1.3	+0.4	+0.8	+0.4	+0.7
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

Table 19

Cross-Border Investments Reduction in Favour of Domestic ones

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No	85.6	86.0	81.0	89.0	78.7	87.0	86.4	-	90.2	86.8	86.7	90.5	83.6	83.6	87.3	90.4	80.8
Yes	9.3	9.6	4.8	7.7	12.0	7.5	10.2	-	5.7	9.5	8.0	6.0	10.9	9.3	9.2	7.0	11.5
Not applicable	5.1	4.5	14.3	3.3	9.3	5.5	3.4	-	4.1	3.7	5.3	3.4	5.5	7.1	3.5	2.5	7.7
Number of responses	313	292	21	182	75	146	59	-	122	190	75	116	55	140	173	157	156

In conclusion, VCs were also asked to indicate their preferred geographic target from a continent perspective. Coherently with the fact that most of the VCs in the sample come from Europe, the area resulted as the preferred geographic target where to invest (53.8%) followed by North America (41.1%). Through a McNemar test (see **Figure 17** for the answers' frequency in detail), the only statistically significant change due to the pandemic in geographic targets is in EU (p-value: 1.95%) which increased of around 2%, even if a decrease in investments the whole America is also present (p-value: 6.25%). Captive VCs invest more in the EU with respect to IVCs, while VCs that were negatively affected by the pandemic invest more in Asia and Africa and less in North America with respect to the positively affected ones. Early-stage VCs invest more in America while the ones targeting late-stage ventures invest more in Europe, Asia, and Africa, probably due to the favourable innovation driven environment present in North America. It is also interesting to observe that 70% of the VCs doing cross-border investment target Europe, and 50% of them target North America, highlighting the importance of such geographic areas. VCs targeting low IRR prefer Europe, while the ones targeting high IRR prefer North America, reputable VCs increased more investments in Europe and decreased more investments in North America with respect to low reputable ones that also focus more on a specific geographical target. Lastly, VCs located in Europe invest for the majority in their origin country, and almost one over four of them invest in North America, differently than VCs located outside Europe for which the most targeted country is North America followed by Asia.

Table 20

Targeted Geographies

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No Specific Target	4.5	4.5	5.4	5.5	0.8	2.8	2.9	1.6	3.3	3.7	7.8	2.6	14.8	3.9	5.3	2.2	6.5
	+0.4	+0.4	0.0	+0.3	+0.8	+0.8	-1.0	+0.5	+0.8	+0.3	0.0	0.0	0.0	+0.7	0.0	-0.5	+1.1
Europe	53.8	51.6	81.1	53.2	54.4	51.6	61.0	38.3	70.5	57.0	45.3	62.7	44.4	46.7	61.1	96.9	18.1
	+1.9	+2.1	0.0	+2.1	+2.4	+1.6	+2.8	+1.1	+0.8	+3.0	+0.8	+1.0	+5.0	+2.3	+1.7	+0.5	+3.2
North America	41.1	41.2	40.5	44.0	34.4	41.5	31.4	34.7	50.0	38.0	49.2	37.8	43.2	33.6	49.0	24.0	55.2
	-1.0	-1.1	0.0	-0.7	-0.8	-0.8	0.0	-0.5	0.0	-1.0	-0.8	-0.5	-2.5	-1.9	0.0	-0.9	-1.0
Asia	22.5	22.4	24.3	18.8	31.2	18.1	23.8	16.1	28.7	22.3	18.8	20.2	29.6	23.6	21.5	8.3	34.3
	0.0	-0.4	+5.4	+1.0	-0.8	+0.4	-0.9	0.0	-0.8	+0.7	+0.7	+0.5	-2.4	-0.8	+0.8	+0.9	-0.7
Central and South America	7.9	7.9	8.1	7.5	8.8	8.1	3.8	6.2	10.7	8.0	10.2	7.8	7.4	8.5	7.3	3.1	11.9
	+1.0	+0.8	+2.7	+1.0	+1.6	+1.6	0.0	+0.5	+0.8	+0.7	+1.5	+1.0	+2.5	+1.2	+0.8	+0.4	+1.5
Africa	6.1	6.2	5.4	5.1	10.4	3.2	5.7	4.7	9.0	8.7	2.3	5.2	0.0	6.9	5.3	2.2	9.4
	-0.2	-0.2	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	-0.4	0.0	-0.4
Oceania	1.6	1.7	0.0	1.7	2.4	1.2	1.0	1.0	0.8	1.7	1.6	2.1	0.0	0.8	2.4	0.4	2.5
	+0.4	+0.4	0.0	+0.7	0.0	+0.4	0.0	0.0	+1.7	+0.3	0.0	+0.5	0.0	+0.4	+0.4	+0.9	0.0
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

5.2. Deal Origination and Selection

To generally assess the impact of the pandemic on each step of the investment process, VCs were asked to evaluate the change in time/effort required/complexity to complete them, as shown in **Table 21** and **Table 22** for the first two steps. Only for around 43% of the VCs no change was registered in deal origination, with a balance in those that reported a decrease and those that reported an increase, but still with a surplus (calculated doing the difference between the answers that reported a moderate/significant increase and the ones that reported a moderate/significant decrease) of around 11% of VCs that experienced an increase, confirming that the pandemic didn't facilitate deal origination. Similarly, also the time required in the deal selection phase didn't change for the majority of VCs (55.3%), with an overall increase (i.e., surplus) a bit higher than the deal origination, i.e., around 14%, confirming that overall deal selection have been more impacted than deal origination. Looking across categories, both VCs negatively and positively impacted by the pandemic experienced a higher time/complexity in both deal origination and selection, with a higher impact in deal selection for the negatively affected ones that, surprisingly, reported a lower impact in deal origination. Also, captive VCs reported a higher increase in time in deal origination but a lower one in deal selection with respect to IVCs. Furthermore, small fund size, VCs targeting late-stage ventures, low IRR, and domestic ventures only, along with VCs benefitting from a higher reputation, and the ones located outside EU, experienced a higher increase in time/complexity (i.e., surplus) in both phases with respect to their counterpart. It is also interesting to highlight that VCs doing cross-border investments reported an overall decrease in time in deal selection, probably thanks to the teleworking practice that took place as a response to the pandemic.

Table 21

Time/Complexity Change in Deal Origination

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	8.7	8.7	8.1	7.5	12.8	8.9	6.7	10.4	5.7	8.7	5.5	8.3	9.9	10.4	6.9	6.6	10.5
Moderately Increased	25.3	24.9	29.7	26.6	23.2	23.8	27.6	23.8	25.4	26.7	25.8	25.4	22.2	26.3	24.3	26.6	24.2
No Change	43.3	43.3	43.2	43.3	36.0	43.5	46.7	47.2	42.6	43.3	43.8	40.4	48.1	42.5	44.1	40.2	45.8
Moderately Decreased	17.8	18.1	13.5	17.7	21.6	18.5	12.4	15.5	18.9	16.7	21.9	20.7	16.0	17.4	18.2	21.8	14.4
Significantly Decreased	4.9	4.9	5.4	4.8	6.4	5.2	6.7	3.1	7.4	4.7	3.1	5.2	3.7	3.5	6.5	4.8	5.1
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Table 22

Time/Complexity Change on Deal Selection

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	4.7	4.7	5.4	3.1	8.8	4.4	5.7	4.1	3.3	4.0	3.1	3.6	6.2	6.2	3.2	2.2	6.9
Moderately Increased	24.7	24.9	21.6	24.2	29.6	21.4	27.6	24.9	18.9	25.7	21.9	26.4	25.9	22.4	27.1	27.1	22.7
No Change	55.3	55.4	54.1	56.7	49.6	58.5	50.5	59.6	53.3	55.7	55.5	54.9	53.1	60.6	49.8	54.6	56.0
Moderately Decreased	13.6	13.4	16.2	14.3	10.4	14.5	14.3	9.8	20.5	13.7	16.4	13.5	14.8	9.3	18.2	14.4	13.0
Significantly Decreased	1.6	1.5	2.7	1.7	1.6	1.2	1.9	1.6	4.1	1.0	3.1	1.6	0.0	1.5	1.6	1.7	1.4
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

To understand how VCs consider the different deal sources, they were asked to assign a score from 1 to 5 for each listed deal source depending on their assigned level of importance, as shown in **Table 23**. The most important form of deal source is the management of the VC firm, followed by proactive self-generation and VC professional network. A Wilcoxon signed-rank test has been applied for each factor of the "All" category (see **Figure *18*** in the appendix for the answers' frequency in detail), to check whether the factors associated importance of the pre and post pandemic outbreak remained the same, showing that the following factors have a statistically significant change (i.e., the null hypothesis was rejected): management (p-value: 0.63%), other VC firms or angels (0.00%), portfolio companies (2.30%), proactive self-generation (0.00%), quantitative sourcing (0.34%) and VC professional network (0.92%). Although some changes in the importance attributed to each source due to the pandemic are present, the relative importance of the different factors remained almost constant except for the usage of portfolio companies that became more important than the accelerators/incubators/technology parks that in fact is the only category that witnessed a decrease. The major increase is instead present in the usage of other VC firms or angels as deal source, probably due to the higher uncertainty VCs preferred to syndicate deals therefore share the associated risks, followed by the use of quantitative sourcing and proactive self-generation. It is also interesting to observe that VCs negatively affected by the pandemic increased with a higher magnitude their importance in factors like other VC firms or angels and VC professional network, therefore related to syndication, than VCs positively affected by the pandemic. They also decreased their importance in management, portfolio companies, limited partners and controlling corporation/bank differently to their counterpart that instead increased it. For what pertains the typologies of VC, captive VCs give more importance to the VC professional network than the proactive self-generation, differently to IVCs, and they also decreased the importance associated to almost all the different factors except for quantitative sourcing and governmental body that increased, differently IVCs preferences are pretty similar to the previously mentioned general ones. Obviously, several differences are present between early-stage and late-stage VCs, with management becoming second in importance after the pandemic behind proactive self-generation for the late category that in fact attributes a

substantial higher importance to this type of source. Also, VCs targeting early-stage ventures attribute more importance to accelerators/incubators/technology parks or other VC firms or angels. Lastly, VCs with a higher reputation give in general more importance to all factors with respect to the ones with a lower reputation (average of 3.09 vs 2.77), probably related to the fact that, as evidenced in literature, they are able to access high quality sources.

Table 23

Importance of Deal Sources

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Management	4.22	4.25	3.86	4.23	4.22	4.26	4.05	4.20	4.29	4.23	4.20	4.13	4.58	4.27	4.17	4.05	4.37
	+0.03	+0.04	-0.09	+0.03	-0.02	+0.03	+0.05	+0.03	0.00	+0.01	+0.07	+0.01	-0.04	+0.03	+0.03	+0.03	+0.02
Proactive Self-Generation	3.83	3.85	3.63	3.74	3.96	3.60	4.18	3.88	3.79	3.86	3.80	3.77	3.86	3.77	3.90	3.79	3.86
	+0.10	+0.11	-0.09	+0.10	+0.08	+0.14	+0.07	+0.03	+0.10	+0.09	+0.13	+0.05	+0.09	+0.09	+0.10	+0.10	+0.10
VC Professional Network	3.51	3.49	3.77	3.56	3.55	3.41	3.37	3.39	3.66	3.46	3.62	3.39	3.84	3.48	3.55	3.56	3.48
	+0.05	+0.07	-0.11	+0.04	+0.13	+0.04	+0.06	+0.04	+0.02	+0.05	+0.02	0.00	+0.13	+0.08	+0.02	-0.03	+0.11
Other VC Firms or Angels	3.19	3.17	3.50	3.19	3.15	3.22	2.57	2.94	3.37	3.10	3.34	3.00	3.32	3.18	3.20	3.21	3.17
	+0.13	+0.14	-0.03	+0.12	+0.16	+0.15	+0.15	+0.12	+0.07	+0.15	+0.10	+0.14	+0.02	+0.14	+0.12	+0.11	+0.14
Accelerators / Incubators / Technology Parks	2.84	2.82	3.03	2.77	2.94	3.05	1.84	2.75	2.90	2.80	2.81	2.78	2.58	3.07	2.59	2.86	2.82
	-0.03	-0.02	0.00	-0.02	-0.08	-0.01	+0.05	-0.01	-0.11	-0.03	+0.03	0.00	+0.05	0.00	-0.05	-0.02	-0.02
Portfolio Companies	2.78	2.82	2.20	2.83	2.78	2.74	2.52	2.70	2.95	2.70	2.88	2.60	3.31	2.69	2.87	2.47	3.03
	+0.07	+0.08	-0.07	+0.09	-0.01	+0.10	+0.07	+0.04	+0.03	+0.06	+0.09	+0.06	+0.04	+0.04	+0.09	+0.05	+0.07
Quantitative Sourcing	2.37	2.39	2.18	2.43	2.34	2.24	2.66	2.19	2.54	2.44	2.36	2.34	2.65	2.25	2.48	2.44	2.30
	+0.11	+0.11	+0.11	+0.11	+0.11	+0.13	+0.08	+0.06	+0.11	+0.12	+0.03	+0.10	+0.12	+0.08	+0.14	+0.12	+0.10
Limited Partners	2.31	2.31	2.32	2.29	2.28	2.36	2.04	2.16	2.55	2.22	2.35	2.18	2.33	2.43	2.19	2.16	2.42
	0.00	0.00	-0.05	+0.03	-0.01	+0.01	+0.01	-0.02	-0.06	+0.02	-0.06	0.00	-0.11	+0.01	-0.01	0.00	+0.01
Controlling Corporation/Bank	2.11	2.04	2.62	1.94	2.45	1.68	2.37	2.04	2.02	2.10	2.02	1.79	2.31	1.99	2.19	1.93	2.27
	+0.03	+0.03	-0.04	+0.04	-0.02	-0.02	+0.04	-0.05	+0.11	+0.03	+0.02	+0.02	0.00	-0.01	+0.05	+0.03	+0.02
Governmental Body	1.83	1.79	2.14	1.78	1.84	1.84	1.65	1.98	1.55	1.83	1.79	1.68	2.07	1.85	1.81	1.79	1.87
	+0.02	+0.02	+0.05	+0.04	+0.05	+0.04	-0.04	-0.04	+0.02	+0.03	-0.05	0.00	0.00	0.00	+0.05	0.00	+0.04
Number of responses	485	450	35	282	120	239	100	184	116	287	124	188	78	244	241	220	265

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak.

Like the previously described question, VCs were also asked to attribute a level of importance from 1 to 5 to the different factors that affect their decision making while selecting potential investments, results are shown in **Table 24**. Coherently with the findings of Gompers et al. (2020; 2021), the venture's management team resulted as the most important factor, followed by the business model and the product/technology. A difference can instead be spotted in the fit with the fund and the ability to add value, which gained importance with respect to the total addressable market during the last years. Concerning the possible changes due to the COVID-19 outbreak, applying the Wilcoxon signed-rank test, all the listed factors, except the gut feel, resulted to have a statistically significant change in the median of their distribution (p-values: 0.00%, see **Figure 19** in the appendix for the answers' frequency in detail). The factor that gained more importance is, not surprisingly, the one related to the public market

incentives, i.e., the governments' responses to the crisis that deeply influenced the economic environment by injecting money. Strictly related is also the second factor that gained more importance, i.e., the favourable economic environment. All the other factors increased their importance, with the business model that became the most important factor along with the management and the fit with the fund that also became as important as the ability to add value. VCs negatively affected by the pandemic behaved similarly to the ones positively affected, with a difference in the increase in importance attributed to the public financial incentives that resulted almost double reaching +0.27, the highest increase recorded. Considering instead the typology of VC, several differences are noticeable starting from the favourable economic environment factor that severely increased for the IVCs but decreased with a similar magnitude for captive VCs, with a similar trend also for the fit with the fund and the total addressable market. Looking at the stages, VCs targeting late-stage ventures have as the most important factor the business model, differently to the ones targeting early-stage ventures that gave the highest importance to the product/technology prior to the pandemic to change it with the venture's management team after the pandemic. VCs targeting domestic ventures acted similarly with the one doing cross-border investments but increased with a higher magnitude the importance attributed to the public financial incentives, similarly to VCs located in the rest of the world that did the same with respect to the ones located in Europe. Furthermore, VCs targeting a low IRR have as most important factor the business model, while the one targeting a high IRR have the venture's management team, exactly like the funds with a large size with respect to the ones with a small size. Also, more reputable VCs give more importance to the different factors with respect to the less reputable ones, similarly to what was evidenced analysing the different deal sources.

Table 24

Factors Affecting Deal Selection

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Venture's Management Team	4.36	4.35	4.44	4.40	4.36	4.38	4.10	4.35	4.30	4.34	4.43	4.34	4.33	4.43	4.29	4.27	4.43
	+0.09	+0.10	0.00	+0.08	+0.10	+0.12	+0.09	+0.10	+0.07	+0.09	+0.08	+0.07	+0.04	+0.09	+0.09	+0.11	+0.08
Business Model Competitive Position	4.33	4.33	4.28	4.30	4.50	4.26	4.46	4.32	4.37	4.37	4.17	4.31	4.46	4.33	4.33	4.24	4.40
	+0.12	+0.13	0.00	+0.14	+0.04	+0.13	+0.09	+0.14	+0.11	+0.11	+0.13	+0.10	+0.07	+0.14	+0.10	+0.11	+0.13
Innovative and Scalable Product/Technology	4.28	4.28	4.36	4.27	4.30	4.40	3.87	4.27	4.28	4.24	4.35	4.19	4.42	4.39	4.17	4.29	4.28
	+0.08	+0.08	0.00	+0.09	+0.08	+0.05	+0.19	+0.07	+0.05	+0.09	+0.05	+0.06	+0.05	+0.06	+0.10	+0.07	+0.08
Fit with Fund	4.12	4.13	3.97	4.06	4.28	4.14	4.02	3.99	4.17	4.12	4.19	4.03	4.16	4.19	4.04	4.09	4.14
	+0.07	+0.08	-0.11	+0.09	+0.02	+0.08	+0.07	+0.12	+0.01	+0.06	+0.04	+0.02	+0.09	+0.09	+0.05	+0.06	+0.08
Ability to Add Value	4.07	4.09	3.83	4.07	4.17	3.94	4.27	4.03	4.06	4.05	4.05	3.96	4.39	4.06	4.08	3.92	4.19
	+0.12	+0.12	+0.09	+0.12	+0.07	+0.15	+0.08	+0.12	+0.08	+0.14	+0.07	+0.09	+0.02	+0.17	+0.07	+0.09	+0.14
Total Addressable Market	3.86	3.86	3.78	3.88	3.86	3.99	3.50	3.77	3.88	3.74	4.02	3.73	4.05	3.94	3.78	3.76	3.93
	+0.08	+0.10	-0.09	+0.09	+0.09	+0.08	+0.10	+0.11	+0.04	+0.07	+0.08	+0.11	+0.05	+0.07	+0.09	+0.07	+0.11
Industry	3.64	3.65	3.51	3.63	3.62	3.51	3.77	3.58	3.80	3.60	3.77	3.55	3.92	3.63	3.66	3.52	3.75
	+0.13	+0.14	+0.03	+0.10	+0.13	+0.11	+0.09	+0.13	+0.10	+0.12	+0.12	+0.12	+0.03	+0.15	+0.11	+0.08	+0.16
Gut Feel	3.19	3.23	2.69	3.21	3.19	3.30	2.89	3.13	3.18	3.10	3.32	3.11	3.29	3.25	3.12	3.09	3.27
	-0.05	-0.04	-0.08	-0.04	-0.05	-0.04	-0.09	-0.01	-0.11	-0.05	+0.03	-0.05	-0.04	-0.05	-0.03	-0.05	-0.03
Favourable Economic Environment	2.95	2.94	3.09	2.89	3.10	2.91	3.03	2.88	2.94	2.90	2.94	2.80	3.13	3.00	2.90	2.69	3.17
	+0.16	+0.19	-0.23	+0.15	+0.12	+0.15	+0.10	+0.11	+0.11	+0.14	+0.20	+0.11	+0.05	+0.19	+0.12	+0.14	+0.16
Public Financial Incentives	1.89	1.88	2.04	1.88	1.91	1.86	1.76	1.84	1.91	1.88	1.85	1.78	2.06	1.93	1.85	1.75	2.02
	+0.18	+0.19	0.00	+0.15	+0.27	+0.12	+0.09	+0.21	+0.09	+0.17	+0.15	+0.16	+0.19	+0.17	+0.18	+0.11	+0.24
Number of responses	497	461	36	291	121	242	105	188	120	297	125	191	80	251	246	223	274

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

An additional question related to the change in the likelihood to take a "gut decision" after the COVID-19 outbreak was asked to VCs, the results are reported in **Table 25**. Coherently with what was evidenced in **Table 24**, a decrease of 6.1% is present (calculated subtracting the frequency of the answer "More" to "Less"), highlighting a decrease in confidence in decisions taken by VCs themselves without supporting data and opinions, probably due to the inconvenient period where the sensitivity to mistakes was higher. The same pattern is present among all the different categories, with late-stage VCs that accentuated this effect the most (20% decrease), followed by captive VCs (18.9% decrease) and the ones doing cross-border investments (13.2% decrease). The effect is instead very small for VCs that profited thanks to the pandemic, and the ones targeting early-stage ventures. Interestingly, VCs targeting high IRR even reported an increase in their reliance on "gut decisions" (2.4% increase).

Table 25

Change in Likelihood to Take a "Gut Decision" During Investment Decision

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Same	69.4	68.9	75.7	70.3	64.0	69.8	66.7	68.9	67.2	68.0	75.8	73.1	71.6	69.5	69.2	75.1	64.6
Less	18.4	18.1	21.6	15.7	24.0	16.1	26.7	18.1	23.0	21.3	10.9	19.2	17.3	16.6	20.2	17.5	19.1
More	12.3	13.0	2.7	14.0	12.0	14.1	6.7	13.0	9.8	10.7	13.3	7.8	11.1	13.9	10.5	7.4	16.2
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

5.3. Valuation

Also for this phase, VCs were asked to evaluate the change in time/effort required/complexity, as shown in **Table 26**. For around 43% of the VCs no change was registered, with a clear increase in the overall time/complexity spent in valuation, with a surplus (calculated doing the difference between the answers that reported a moderate/significant increase and the ones that reported a moderate/significant decrease) of around 29%, confirming that this phase impacted more VCs than deal origination and selection. Looking across categories, the overall tendency of a higher time needed remains. Both VCs negatively and positively impacted by the pandemic experienced an increase in time/complexity for around 30-32% of the sample. Also, IVCs, large fund size, VCs targeting low IRR, and domestic ventures only, along with VCs benefitting from a higher reputation, and the ones located outside EU, experienced a higher increase in time/complexity (i.e., surplus) with respect to their counterpart. Late-stage VCs are the ones that suffered the most, with around 43% of the sample reporting an increase in time, while early-stage VCs are the ones that were impacted the least, with only 19.8% of the sample reporting an increase in time/complexity.

Table 26

Time/Complexity Change in Valuation

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	8.3	8.5	5.4	7.5	12.0	4.4	12.4	8.8	8.2	8.0	7.0	6.2	7.4	8.1	8.5	5.7	10.5
Moderately Increased	34.8	35.4	27.0	36.9	33.6	31.5	42.9	34.7	35.2	37.0	31.2	34.7	39.5	31.3	38.5	32.8	36.5
No Change	42.9	41.8	56.8	41.3	40.8	48.0	33.3	43.0	38.5	42.7	43.8	42.5	39.5	47.1	38.5	48.9	37.9
Moderately Decreased	11.9	12.6	2.7	12.3	12.0	14.5	6.7	10.9	13.1	10.0	16.4	14.5	13.6	12.0	11.7	11.4	12.3
Significantly Decreased	2.2	1.7	8.1	2.0	1.6	1.6	4.8	2.6	4.9	2.3	1.6	2.1	0.0	1.5	2.8	1.3	2.9
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

To start understanding the behaviour of VCs while evaluating their potential investments, and the effect of the pandemic on such practice, VCs were asked to indicate the financial metrics usually used, as shown in **Table 27**. Almost 12% of the respondents reported not to use any type of financial metrics, almost half of the sample instead uses IRR (49.6%) and the cash-on-cash multiple (48.8%), followed by the multiple of sales/EBITDA (26.1%), the NPV (19.4%), other types of metrics (18%) and lastly the hurdle rate (12.8%). A McNemar test have been applied to test the null hypothesis that there is no change between the pre and post pandemic frequency of usage of a financial metric, resulting in "other" (p-value: 3.12%) as the only metric with a statistically significant change, i.e., rejected the null hypothesis, in its frequency of usage (see **Figure 20** in the appendix for the answers' frequency in detail). In fact, a 1.2%

increase in its usage has been reported, meaning that the pandemic led VCs to increment the use of different types of metrics that are not listed in the table. It is also interesting to highlight that VCs positively affected by the pandemic actually use financial metrics with a lower frequency with respect to the ones negatively affected, that also resort to the use of the NPV with a frequency that is almost double. Almost 20% of VCs targeting early-stage ventures don't use any type of metric, differently to the ones targeting late-stage ventures who rely on them for the 99% of the time, coherently with the fact that the later the stage the lower is the associated uncertainty in the financial projections of the venture. Additionally, almost 2/3 of late-stage VCs use the IRR and the cash-on-cash multiple, differently to early-stage VCs for which only about 38% of the sample rely on their usage, with the latter that make more use of different types of metrics. Furthermore, VCs targeting high IRR make less use of financial metrics with respect to the ones targeting low IRR, similarly to the more reputable VCs and large fund size, with respect to their counterparts. Concluding, despite the pandemic, the usage of the different metrics seems to be remained almost constant, with VCs not resorting on any type of metric that continued to do so, and almost all the different subgroups of VCs that increased their usage of other types of metrics than the one listed in the table and decreased the usage of the IRR.

Table 27

Financial Metrics used to Analyse Investments

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
None	11.9	11.9	10.8	12.6	5.6	19.4	1.0	14.5	10.7	8.0	14.8	10.9	14.8	13.9	9.7	10.5	13.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRR	49.6	49.0	56.8	48.1	56.0	37.5	67.6	53.9	45.1	56.7	41.4	52.8	50.6	48.6	50.6	46.7	52.0
	-0.6	-0.6	0.0	-0.7	-1.6	-0.8	+1.9	-2.1	+0.8	-0.7	0.0	-1.0	-1.2	-1.9	+0.8	+0.9	-1.8
Cash-on-Cash Multiple	48.8	49.3	43.2	50.5	47.2	38.7	65.7	47.7	48.4	53.3	44.5	53.4	55.6	43.2	54.7	52.4	45.8
	+0.8	+0.6	+2.7	+0.4	+2.4	+0.4	+1.0	+0.5	+1.6	+1.0	+0.8	0.0	0.0	0.0	+1.6	+0.9	+0.8
Multiple of Sales/EBITDA	26.1	26.2	24.3	27.3	27.2	19.8	38.1	27.5	26.2	26.7	24.2	25.4	28.4	24.7	27.5	26.2	26.0
	+0.6	+0.7	0.0	0.0	+1.6	0.0	0.0	0.0	+0.8	+0.6	0.0	0.0	+1.2	+0.4	+0.8	+0.9	+0.4
NPV	19.4	19.6	16.2	15.7	31.2	14.5	20.0	15.5	21.3	21.7	16.4	17.1	25.9	20.1	18.6	22.7	16.6
	+0.4	+0.4	0.0	+0.3	+0.8	+0.4	+1.0	0.0	+0.8	+0.6	0.0	+0.5	0.0	+0.4	+0.4	0.0	+0.7
Other	18.0	17.9	18.9	18.8	17.6	20.2	14.3	14.5	23.8	17.3	19.5	19.2	19.8	18.1	17.8	21.0	15.5
	+1.2	+1.3	0.0	+0.7	+2.4	+1.2	0.0	+0.5	+1.6	+1.4	+0.8	+1.5	+2.4	+1.6	+0.8	0.0	+2.2
Hurdle Rate	12.8	13.2	8.1	13.0	12.8	10.9	15.2	10.9	12.3	13.3	14.1	11.9	19.8	11.2	14.6	12.2	13.4
	+0.6	+0.7	0.0	+0.7	+0.8	+0.4	0.0	+0.5	+1.6	+0.7	+0.7	0.0	+1.2	+0.4	+0.8	+0.5	+0.7
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

After understanding which type of financial metrics are used, VCs were asked to indicate the target IRR for the fund they are working in, as shown in **Table 28**. Most of the funds target an IRR at 20-29% (54.3%), followed by 30-39% (21.8%) and 10-19% (12.5%). Again, after applying a McNemar test (see

Figure 21 in the appendix for the answers' frequency in detail) a statistically significant change is present in the 20-29% (p-value: 0.39%) and the 10-19% (0.78%) categories. In fact, it is possible to observe a decrease in 20-29% and 30-39% (p-value: 6.25%) and an increase in 10-19% and <10% as targets, highlighting a change towards lower IRR target values, a logical consequence of the higher uncertainty. Captive VCs on average target lower IRRs compared to IVCs, similarly to VCs negatively affected by the pandemic for which an increase of 5.2% of funds targeting a 10-19% return is present. Furthermore, less reputable VCs, those targeting late-stage ventures and those located in the EU also target lower IRRs in higher percentages with respect to their counterparts. Contrary to the overall trend, VCs positively affected by the pandemic and early-stage VCs increased, on average, their fund required target IRR. As shown, results seem to be contrasting with the findings of Gompers et al. (2021) that evidenced 32% as the target IRR required by the majority of VC funds.

Table 28

Target IRR of the Fund

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
< 10%	1.5	1.2	6.1	1.1	2.6	1.8	0.0	3.3	0.0	2.3	-	1.7	1.3	2.1	0.9	3.0	0.4
	+0.7	+0.7	0.0	-0.4	+1.7	-0.4	+1.0	+0.6	+1.9	+0.7	-	0.0	0.0	+0.5	+0.8	+0.5	+0.7
10-19%	12.5	11.6	24.2	10.1	16.4	8.6	13.5	12.8	13.0	19.3	-	9.5	10.5	12.0	13.0	18.3	8.0
	+1.7	+1.9	0.0	+0.3	+5.2	+1.9	+1.9	+2.8	+1.8	+2.0	-	+1.1	+4.0	+0.4	+3.0	0.0	+3.1
20-29%	54.3	53.8	60.6	54.9	51.7	54.1	65.4	50.6	62.0	78.3	-	58.7	44.7	52.4	56.3	55.0	53.8
	-1.9	-2.1	0.0	-1.2	-3.4	-4.1	0.0	-5.0	-2.7	-2.6	-	0.0	-5.2	+1.2	-5.2	-1.0	-2.7
30-39%	21.8	23.0	6.1	22.0	22.4	21.8	16.3	24.4	16.7	-	66.4	21.2	28.9	22.7	20.8	15.3	26.7
	-1.1	-1.2	0.0	+0.4	-2.6	+0.9	-2.8	+1.2	-1.9	-	-3.1	-2.8	-1.3	-2.1	0.0	+0.5	-2.3
40-49%	4.3	4.4	3.0	4.9	3.4	5.5	2.9	3.9	3.7	-	14.8	4.5	5.3	5.6	3.0	5.4	3.4
	+0.4	+0.5	0.0	+0.7	-0.8	+0.9	0.0	0.0	+0.9	-	+1.6	+0.5	+2.6	-0.4	+1.3	-0.4	+1.2
> 50%	5.6	6.0	0.0	7.1	3.4	8.2	1.9	5.0	4.6	-	18.8	4.5	9.2	5.2	6.1	3.0	7.6
	+0.2	+0.3	0.0	0.0	0.0	+0.9	0.0	+0.6	0.0	-	+1.5	+1.1	0.0	+0.4	0.0	+0.5	0.0
Number of responses	464	431	33	268	116	220	104	180	108	300	128	179	76	233	231	202	262

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

To conduct a more in-depth analysis, it was also asked to VCs what their target rate of return prior to the pandemic was, as shown in **Table 29**. The vast majority of the sample (almost 90%) reported the use of a risk-adjusted market rates of return, with small percentages using a closer to capital preservation return (4.4%), a lower but closer to market rate return (3.8%) and lastly, a lower than market rate of return (2.5%). The same applies to all the different categories, with a significant difference only for the captive VCs that use in greater percentage (27.3%) a rate of return closer to capital preservation with respect to IVCs. Also, late-stage VCs use in higher proportions a rate of return lower than the market rate (8.6%) with respect to early-stage VCs, while more reputable VCs target rate of returns closer to capital

preservation with respect to less reputable ones. Lastly, VCs located outside of Europe and the ones positively affected by the pandemic, seem to not target rate of returns below the market rate.

Table 29

Targeted Rate of Return Prior to the Pandemic

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Risk-Adjusted Market Rates	89.4	90.6	72.7	91.8	86.0	88.6	91.4	86.4	89.6	86.9	93.5	94.6	88.9	86.7	92.9	86.7	91.0
Closer to Capital Preservation	4.4	2.7	27.3	4.7	4.0	5.7	0.0	6.8	2.1	4.0	3.2	1.8	7.4	5.6	2.9	3.3	5.0
Below but Closer to Market Rate	3.8	4.0	0.0	3.5	6.0	4.3	0.0	3.4	6.2	6.1	0.0	1.8	0.0	5.6	1.4	3.3	4.0
Below Market Rate	2.5	2.7	0.0	0.0	4.0	1.4	8.6	3.4	2.1	3.0	3.2	1.8	3.7	2.2	2.9	6.7	0.0
Number of responses	160	149	11	85	50	70	35	59	48	99	31	56	27	90	70	60	100

VCs were also asked to express the relative importance attributed to the main factors considered when evaluating a company, both in a pre and post COVID-19 scenario, with results that are reported in **Table 30**. The anticipated exit of the company resulted as the most important factor considered while valuing a company, followed by the valuation of comparable investments and the desired ownership fraction. Applying a Wilcoxon signed-rank test both the anticipated exit of the company and the competitive pressure from other VCs resulted with statistically significant changes (p-values: 0.00%) comparing the pre and post COVID-19 outbreak median (see **Figure 22** in the appendix for the answers' frequency in detail). As a matter of fact, it is possible to observe a significant increase in the average importance of both categories even though the increase is also observable in the remaining factors, confirming that all the factors acquired importance probably due to a more precise and careful evaluation process conducted by VCs during this period. As importance priority the trend is similar among all the different categories, apart from Captive VCs that gives more importance to the valuation of comparable investments than the anticipated exit of the company and the competitive pressure from other VCs than the desired ownership fraction. Furthermore, more reputable VCs assign more importance to all the factors with respect to the low reputable ones and the general sample average; VCs targeting early-stage ventures, the ones positively affected by the pandemic along with funds located in EU increased with a higher magnitude the importance of the competitive pressure from other VCs with respect to their respective counterparts. Also, VCs negatively impacted by the pandemic increased the importance of the anticipated exit of the company and the competitive pressure from other VCs but actually decreased the importance of the valuation of comparable investments and the desired ownership fraction. Lastly, VCs targeting high IRR increased a lot more the importance in valuation of comparable investments with respect to the ones targeting low IRR.

Table 30

Factors Affecting Valuation

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Anticipated Exit of the Company	3.96	3.95	4.05	3.91	4.01	3.82	4.06	3.86	4.01	3.91	4.05	3.90	4.10	3.95	3.96	3.88	4.02
	+0.13	+0.14	+0.03	+0.12	+0.15	+0.12	+0.07	+0.19	+0.06	+0.13	+0.09	+0.11	+0.18	+0.13	+0.13	+0.10	+0.16
Valuation of Comparable Investments	3.81	3.79	4.14	3.76	3.95	3.71	3.96	3.74	3.88	3.86	3.64	3.76	3.99	3.80	3.83	3.82	3.80
	+0.05	+0.04	+0.05	+0.07	-0.01	+0.02	-0.03	+0.05	-0.01	+0.01	+0.12	+0.02	+0.10	+0.05	+0.04	+0.02	+0.08
Desired Ownership Fraction	3.34	3.37	2.97	3.32	3.46	3.54	2.89	3.30	3.38	3.22	3.48	3.20	3.49	3.37	3.30	3.33	3.35
	+0.02	+0.02	0.00	+0.06	-0.06	+0.05	+0.02	0.00	0.00	+0.04	-0.01	+0.03	0.00	-0.01	+0.06	+0.02	+0.02
Competitive Pressure from Other VCs	2.80	2.77	3.09	2.82	2.85	2.84	2.56	2.84	2.76	2.72	3.05	2.77	2.89	2.71	2.88	2.81	2.79
	+0.24	+0.26	+0.05	+0.30	+0.15	+0.33	+0.16	+0.22	+0.21	+0.26	+0.22	+0.24	+0.07	+0.29	+0.21	+0.32	+0.18
Number of responses	437	402	35	252	111	212	94	162	107	262	110	171	71	214	223	206	231

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

To also conduct a quantitative analysis on valuation, VCs were asked to quantify the percentage impact that the COVID-19 had on their investments' valuation, as shown in **Table 31** and **Figure 23**. Almost 38% of the VCs reported no changes in their valuations, with this answer being the predominant among all the different categories. Overall, an increase in valuation for 16% of the sample is present (calculated subtracting all the answers that reported a decrease to the ones that reported an increase), with a similar effect also on all the categories except VCs negatively affected by the pandemic and the ones targeting late-stage funds that actually witnessed a decrease of valuation for a net of 15% and 5% of the respective sample. VCs positively affected instead performed way better, reporting an increase in valuation for around 30% of the sample, similarly to VCs targeting high IRR that reported an increase for 29% of the sample. Across all the categories, the increase in valuation percentage is majorly recorded in the range of maximum 20%, while the decrease of around 10%. VCs targeting high IRR, the ones positively affected by the pandemic and large size funds are the ones that increased the most their valuations, with around 20% of the sample that increased their valuations of at least 30%. On the contrary VCs negatively affected by the pandemic are the ones that decreased the most their valuations with 8% of the sample that reduced them by at least 30%. These results reflect the trend identified by Gompers et al. (2021) of higher valuations, but also highlight a greater increase, as previously shown, with respect to the 2.9% detected by them.

Table 31

Impact on Investment Valuation

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
< -60%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-50%	0.6	0.6	0.0	0.0	1.6	0.0	0.0	0.5	0.8	0.7	0.0	0.0	1.2	1.2	0.0	0.0	1.1
-40%	0.2	0.2	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.4
-30%	2.0	2.1	0.0	1.0	5.6	2.4	1.0	2.1	1.6	2.0	3.1	2.1	1.2	1.5	2.4	0.9	2.9
-20%	8.5	8.7	5.4	3.8	16.8	5.2	14.3	11.4	5.7	7.7	7.0	8.3	9.9	10.0	6.9	5.2	11.2
-10%	11.9	12.2	8.1	8.9	17.6	11.3	18.1	13.5	10.7	14.3	7.8	12.4	12.3	11.2	12.6	10.9	12.6
0%	37.7	36.2	56.8	41.6	30.4	36.7	38.1	36.8	41.8	39.7	35.2	42.5	33.3	40.5	34.8	48.0	29.2
+10%	7.9	8.1	5.4	8.9	5.6	9.3	7.6	8.3	9.0	7.0	10.2	8.8	8.6	7.3	8.5	9.2	6.9
+20%	14.4	15.1	5.4	16.4	11.2	15.7	9.5	13.0	13.9	14.3	16.4	12.4	19.8	13.5	15.4	10.0	18.1
+30%	7.3	7.0	10.8	7.2	7.2	8.5	7.6	6.2	9.0	6.7	7.8	6.7	3.7	6.9	7.7	6.1	8.3
+40%	2.8	2.8	2.7	3.8	0.8	2.8	1.0	2.1	2.5	2.3	2.3	2.1	3.7	2.3	3.2	2.2	3.2
+50%	4.3	4.3	5.4	5.8	1.6	4.4	2.9	4.1	2.5	3.7	7.8	2.6	2.5	3.5	5.3	4.4	4.3
> +60%	2.4	2.6	0.0	2.7	0.8	3.6	0.0	2.1	2.5	1.3	2.3	2.1	3.7	1.5	3.2	3.1	1.8
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Looking instead at the adjustments done by VC in valuations as a response to the COVID-19 outbreak, shown in **Table 32**, it is possible to observe that almost half of the sample adjusted their valuation due to cash flow projections, while around 38% of the VCs didn't do any adjustment. Also, one VC over four adjusted for the difficulty in finding financial resources, around 10% for the allocation of a higher cost of capital, and the 7% for other reasons. This ranking is consistent among all the different subgroups except for VCs negatively affected and funds targeting high IRR. Indeed, VCs positively affected by the pandemic did less adjustments than the one negatively affected for which almost 60% of the sample adjusted due to cash flow projections and the 38% for difficulties in finding financial resources, and almost 45% of VCs targeting high IRR did no adjustments. Looking at the targeted stages, although early-stage VCs are close to the late-stage ones in terms of no adjustments, the latter adjusted valuations in higher percentage (60%) due to cash flow projections and a lower percentage for difficulties in finding financial resources, this is coherent with the fact that late-stage VCs rely more on cash flows to valuate ventures than early-stage. Also looking at the IPO rate, more reputable VCs adjusted more than less reputable ones, similarly to funds located in Europe compared to the ones located outside Europe. Lastly, looking at the fund size, small funds adjusted less than large ones but those who adjusted did so accounting for more factors.

Table 32

Adjustments in Valuations After the COVID-19 Outbreak

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No Adjustments	37.7	37.7	37.8	43.0	28.0	39.1	35.2	36.8	42.6	36.0	44.5	42.5	35.8	35.1	40.5	41.0	35.0
Cash Flow Projections	48.8	49.0	45.9	45.4	58.4	44.0	60.0	48.7	47.5	51.0	40.6	46.6	54.3	51.0	46.6	46.7	50.5
Difficulty in Finding Financial Resources	26.5	25.8	35.1	21.5	37.6	27.4	17.1	30.6	18.0	24.0	29.7	19.7	33.3	27.4	25.5	23.1	29.2
Allocation of a Higher Cost of Capital	11.5	11.5	10.8	9.6	15.2	9.7	11.4	13.5	9.0	12.0	11.7	8.8	14.8	14.3	8.5	7.9	14.4
Other	7.3	7.9	0.0	7.2	4.8	9.3	6.7	5.2	7.4	6.3	7.8	7.8	8.6	6.6	8.1	5.7	8.7
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

To better contextualize the above-mentioned adjustments, VCs were asked in which types of companies they did more relevant adjustments in valuation, as shown in **Table 33**. Embryonic companies are the ones to get more adjustments for around 47% of the sample, while the mature ones received adjustments in valuation by around 43% of the sample. Coherently with results in **Table 32**, where around 38% of VCs declared no adjustments in valuations, 34% of the sample reported no changes. Also, independent VCs adjusted less than captive ones that mostly changed their valuation for mature companies (around 62% of the sample), differently than IVCs that adjusted more for embryonic. Also, VCs negatively impacted adjusted both companies' typologies in higher proportion than positively impacted VCs, similarly to VCs targeting low IRR, located outside Europe and more reputable ones that did the same with respect to their counterparts. For what pertains VCs targeting domestic ventures, and large size funds, they adjusted more mature companies than their counterparts that instead adjusted in higher proportion embryonic companies.

Table 33

Companies Typology with More Relevant Adjustments in Valuation

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
None	34.2	35.0	24.3	38.6	24.0	34.3	33.3	33.7	41.0	32.3	38.3	39.9	32.1	34.4	34.0	40.2	29.2
Both	23.9	23.9	24.3	21.2	32.0	22.2	21.0	23.3	20.5	23.3	23.4	20.7	35.8	21.2	26.7	17.9	28.9
Embryonic	22.9	23.7	13.5	20.8	25.6	30.2	10.5	19.7	23.8	24.0	21.1	16.1	16.0	27.4	18.2	21.0	24.5
Mature	19.0	17.5	37.8	19.5	18.4	13.3	35.2	23.3	14.8	20.3	17.2	23.3	16.0	17.0	21.1	21.0	17.3
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

To complete the valuation phase analysis, VCs were asked to indicate their target multiple or cash-on-cash multiple for an investment, both in a pre and post COVID-19 scenario, as shown in **Table 34**. The majority of VCs indicated a 3-4x target/cash-on-cash multiple (20.2%), followed by > 10x (17.8%) and

4-5x (16.4%), with < 2x being the lowest used multiple (0.6%). Around 65% of the sample is included in the range from 2-3x to 5-6x, with another 25% from 9-10x and higher. Applying a McNemar test (see **Figure 24** for the answers' frequency in detail) the only category recording a statistically significant change from pre to post COVID-19 outbreak is the 3-4x (p-value: 1.95%), which decreased by losing around 2%. Instead, the category that reported the higher increase is the 9-10x, indicating a sensible shift towards higher multiples, in line with the finding of Gompers et al. (2021). Looking at the typology of VCs, it is possible to notice that captive VCs target on average higher multiples, as a matter of fact the most selected one is 5-6x, contrary to the 3-4x of independent VCs, that instead target more extreme multiples with respect to captive VCs (around 19% on > 10x vs 0%). A similar distribution is also visible among VCs positively affected by the pandemic that in fact target for the majority the 3-4x category versus the 5-6x of their counterpart, but almost 29% of the sample target a multiple of at least 9-10x contrary to the 13% of VCs negatively affected by the pandemic, with changes that go in opposite directions as VCs negatively affected decreased their target multiples while the positively affected ones increased them. It goes without saying that VCs targeting early-stage ventures target multiples way higher than late-stage VCs that for almost 70% of the sample target multiples of 2-3x or 3-4x, with the pandemic that even accentuated such a distinction as the former increased their overall target multiples while the latter decreased them. Similarly, VCs targeting high IRR reported higher multiples while the ones targeting lower IRR reported lower ones, with the former decreasing their target multiples as reaction to the pandemic. Also, VCs targeting domestic ventures increased their targeted multiples differently to the ones doing cross-border investments that decreased them as a reaction to the COVID-19 pandemic.

Table 34

Target Multiple or Cash-on-Cash Multiple

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
< 2x	0.6	0.6	0.0	0.3	0.0	0.4	1.0	1.0	0.0	0.7	0.0	0.5	0.0	0.8	0.4	0.0	1.1
	+0.4	+0.5	0.0	+0.4	+0.8	0.0	0.0	+1.1	0.0	+0.6	0.0	0.0	+1.2	+0.8	0.0	+0.4	+0.3
2-3x	13.1	13.2	10.8	11.3	17.7	6.5	30.5	16.7	11.5	18.4	1.6	12.4	13.6	13.2	13.0	14.5	11.9
	+0.4	+0.3	+2.7	-1.1	+4.1	-0.8	+3.8	+0.5	-0.8	+0.3	0.0	+1.1	-1.3	+0.4	+0.4	+0.9	0.0
3-4x	20.2	20.1	21.6	20.8	19.4	14.6	38.1	19.3	18.0	23.1	13.3	21.2	16.0	17.4	23.1	22.8	18.1
	-2.0	-1.7	-5.4	-2.0	-2.5	-1.6	-1.9	0.0	0.0	-2.7	+0.8	-1.5	-1.2	-2.7	-1.2	-2.6	-1.5
4-5x	16.4	16.0	21.6	15.4	16.9	14.2	13.3	15.6	19.7	16.7	21.1	16.1	14.8	18.2	14.6	15.8	17.0
	+0.6	+0.5	+2.7	+1.0	+1.6	0.0	+1.0	+1.6	-0.8	+2.0	-3.1	-0.6	+5.0	+1.6	-0.4	0.0	+1.1
5-6x	15.0	13.9	29.7	13.3	20.2	13.0	8.6	14.6	16.4	13.7	14.8	14.0	19.8	13.6	16.6	14.0	15.9
	-0.7	-0.7	-2.7	-0.7	-3.3	+0.8	-1.9	-3.7	-0.8	-1.3	-0.7	-1.6	-6.2	-0.8	-0.8	-1.7	0.0
6-7x	5.5	5.3	8.1	5.1	6.5	5.3	1.9	5.7	6.6	4.7	8.6	5.7	6.2	6.2	4.9	5.3	5.8
	+0.4	+0.3	+2.7	+0.7	0.0	+0.8	0.0	-1.0	+3.2	+0.7	-0.8	0.0	+2.4	+0.4	+0.4	+2.2	-1.1
7-8x	4.0	4.3	0.0	3.8	4.8	5.3	1.9	4.7	1.6	3.7	3.1	3.6	3.7	5.0	2.8	3.5	4.3
	0.0	0.0	0.0	+0.6	-1.6	-0.8	-0.9	+0.5	-0.8	-0.7	+3.1	+1.1	0.0	-0.3	+0.4	-0.4	+0.4
8-9x	1.2	1.1	2.7	1.0	1.6	1.6	0.0	0.5	1.6	1.3	1.6	1.6	1.2	0.8	1.6	0.4	1.8
	+0.2	+0.2	0.0	+0.4	-0.8	0.0	0.0	0.0	0.0	0.0	0.0	+1.0	0.0	0.0	+0.4	+0.5	0.0
9-10x	6.1	6.6	0.0	7.5	3.2	8.1	2.9	5.2	5.7	7.0	5.5	7.8	6.2	6.2	6.1	5.3	6.9
	+0.8	+0.9	0.0	+0.3	+1.6	+1.6	0.0	+1.6	0.0	+0.7	+0.7	+0.5	0.0	+0.8	+0.8	+0.8	+0.7
> 10x	17.8	18.8	5.4	21.5	9.7	31.2	1.9	16.7	18.9	10.7	30.5	17.1	18.5	18.6	17.0	18.4	17.3
	0.0	0.0	0.0	+0.3	0.0	0.0	0.0	-0.6	0.0	+0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of responses	505	468	37	293	124	247	105	192	122	299	128	193	81	258	247	228	277

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

5.4. Deal Structuring

As every phase, VCs were firstly asked to assess the impact in terms of time/complexity on deal structuring, as shown in **Table 35**. More than 70% of the VCs reported no changes, with an unbalance between those that reported a moderate/significant increase and the ones that reported the opposite of around 13.5%, thus indicating an increase in the time/complexity for such percentage of VCs in deal structuring. Similar percentages are also noticeable across all the categories. It must be said that with respect to the other phases this is the one that reports the highest percentage of VCs perceiving no change, even if the overall effect is worse than other phases like deal origination. Looking at the typology of VCs captive seems to have perceived a lower net increase with respect to the independent ones (5.4% vs 14.2%), similarly to early-stage VCs that reported a significant lower net increase with respect to their counterpart (8.8% vs 20%).

Table 35

Time/Complexity Change in Deal Structuring

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	2.8	3.0	0.0	2.0	6.4	2.4	0.0	1.6	3.3	3.3	2.3	2.1	2.5	4.2	1.2	1.7	3.6
Moderately Increased	18.8	18.8	18.9	21.2	15.2	14.5	26.7	19.7	20.5	19.3	18.0	14.0	19.8	15.8	21.9	18.3	19.1
No Change	70.4	70.6	67.6	69.6	68.8	75.0	66.7	73.6	66.4	69.3	71.1	76.7	69.1	72.6	68.0	70.7	70.0
Moderately Decreased	7.1	7.0	8.1	6.1	8.8	7.7	4.8	4.1	7.4	7.0	7.0	6.2	8.6	6.6	7.7	8.7	5.8
Significantly Decreased	1.0	0.6	5.4	1.0	0.8	0.4	1.9	1.0	2.5	1.0	1.6	1.0	0.0	0.8	1.2	0.4	1.4
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

To contextualize the deal structuring phase, VCs were asked to indicate which factors that characterize deal structuring were affected by the pandemic, with results that are shown in **Table 36**. With almost 50% of the VCs reporting it, due diligence resulted as the most impacted factor in deal structuring, followed by the review with partners and investment committee at around 27%. Almost 37% of the respondents reported there was no impact on the pandemic on this phase therefore it was not affected. Also, only one over five VC reported an impact on the term sheets preparation/contract terms negotiation. Although IVCs reported to be less affected than captive VCs (36.4% vs 43.2%), they had a major impact in due diligence for almost 50% of the sample versus the 37.8% of captive VCs, who then reported higher percentages in the other categories. VCs negatively affected by the pandemic, reported a higher impact on all the factors with respect to their counterpart, similarly to VCs targeting low IRR compared to the ones targeting high IRR. VCs investing in early-stage ventures also seem to be substantially less affected than the ones investing in late-stage ventures (42.4% vs 27.9%), but curiously the former were more impacted in the review with partners and investment committee and "other" factors, showing that the difference in impact resides mostly in due diligence (40.7% vs 61.5%). A very similar situation is present in funds of small size with respect to the large size ones.

Table 36

Factors affected by the COVID-19 Pandemic in Deal Structuring

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Not Affected	36.9	36.4	43.2	39.6	28.8	42.4	27.9	37.8	35.0	33.7	43.4	36.3	34.6	40.1	33.6	36.2	37.5
Due Diligence	48.6	49.4	37.8	45.7	57.6	40.7	61.5	46.5	52.1	50.2	45.1	49.2	53.1	44.1	53.1	42.9	53.4
Review with Partners and Investment Committee	26.8	26.6	29.7	23.5	36.8	24.6	24.0	29.2	26.5	27.1	25.4	22.3	30.9	27.9	25.7	29.0	25.0
Term Sheets Preparation / Contract Terms Negotiation	20.5	20.0	27.0	17.4	29.6	17.8	19.2	21.1	20.5	22.7	15.6	19.2	19.8	21.1	19.9	25.0	16.7
Other	3.9	3.8	5.4	3.8	5.6	3.8	2.9	2.2	6.8	3.8	2.5	2.6	2.5	4.0	3.7	4.5	3.4
Number of responses	488	451	37	293	125	236	104	185	117	291	122	193	81	247	241	224	264

Looking at the contractual features, shown in **Table 37**, VCs reported valuation as the most important feature, followed by board rights and pro-rata rights, while cash-flow rights and dividends as the less important ones. Applying a Wilcoxon signed-rank test (see **Figure 25** in the appendix for the answers' frequency in detail), anti-dilution protection (p-value: 2.32%), investment amount (p-value: 0.00%), liquidation preference (p-value: 0.00%), ownership stake (p-value: 2.12%) and valuation (p-value: 0.00%) resulted with a statistically significant change in their median comparing the pre and post COVID-19 scenario, confirming a change in their importance distribution. As a matter of fact, all the previously-mentioned features increased significantly their importance, with a general trend that shows a higher importance in all the different features, highlighting a more concerned approach by VCs while structuring the deals with entrepreneurs, result of the pandemic crisis. Captive VCs gives more importance to the different features with respect to IVCs, especially the cash flow rights and investment amount, with similar changes in importance after the pandemic outbreak apart from dividends and anti-dilution protection where the trend is opposite with IVCs that increased their importance while captive VCs decreased it. VCs negatively affected, the ones targeting late-stage ventures, large size funds and VCs enjoying a higher reputation, reported board rights as the most important feature prior to the pandemic, with a change in importance after the outbreak that led valuation to become the most important feature, in coherence with their counterparts. Also, a major increase in liquidation preference importance, with respect to their counterparts, is present in the first two types of previously mentioned VCs. Lastly, VCs located in Europe give more importance to board rights, differently to the ones located in the rest of the world that consider valuation as the most important factor both pre and post pandemic outbreak.

It is interesting to note that while Gompers et al. (2021) showed that participation is the most frequent term used followed by redemption rights and liquidation preference, according to the survey results, they are not the most important factors for VCs, indicating that the bargaining power of entrepreneurs is considerable during negotiations, allowing more founder-friendly contract terms.

Table 37

Relevance of Contractual Features

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Valuation	4.21	4.21	4.17	4.22	4.21	4.12	4.38	4.20	4.31	4.17	4.27	4.17	4.32	4.17	4.25	4.13	4.27
	+0.11	+0.11	+0.14	+0.09	+0.15	+0.10	+0.10	+0.14	+0.06	+0.11	+0.10	+0.06	+0.16	+0.11	+0.11	+0.06	+0.16
Board Rights	4.18	4.19	4.08	4.16	4.32	4.00	4.44	4.11	4.21	4.23	4.02	4.13	4.35	4.06	4.29	4.25	4.11
	+0.01	+0.01	+0.03	+0.01	+0.03	+0.03	-0.02	-0.03	-0.01	+0.01	+0.06	+0.01	+0.05	+0.03	+0.01	+0.02	+0.02
Pro-Rata Rights	3.82	3.84	3.69	3.89	3.75	3.92	3.66	3.77	3.91	3.84	3.91	3.78	3.92	3.90	3.74	3.71	3.92
	+0.04	+0.03	0.00	+0.02	+0.04	+0.06	0.00	+0.04	+0.02	+0.01	+0.10	+0.03	+0.02	+0.06	+0.02	+0.02	+0.05
Liquidation Preference	3.69	3.68	3.76	3.74	3.70	3.66	3.65	3.73	3.60	3.66	3.72	3.68	3.78	3.71	3.67	3.74	3.64
	+0.11	+0.12	+0.09	+0.09	+0.18	+0.08	+0.18	+0.11	+0.12	+0.13	+0.06	+0.10	+0.10	+0.10	+0.13	+0.08	+0.15
Investment Amount	3.68	3.66	3.92	3.72	3.67	3.72	3.51	3.63	3.75	3.68	3.62	3.55	3.87	3.70	3.66	3.61	3.73
	+0.12	+0.12	+0.11	+0.15	+0.11	+0.11	+0.05	+0.12	+0.06	+0.12	+0.14	+0.13	+0.04	+0.10	+0.14	+0.13	+0.13
Ownership Stake	3.63	3.65	3.38	3.60	3.67	3.77	3.51	3.57	3.62	3.57	3.67	3.53	3.86	3.59	3.66	3.61	3.64
	+0.04	+0.04	0.00	+0.05	+0.03	+0.07	+0.01	+0.04	+0.01	+0.03	+0.06	+0.03	+0.01	+0.03	+0.06	+0.03	+0.06
Anti-Dilution Protection	3.57	3.55	3.82	3.55	3.66	3.53	3.59	3.43	3.65	3.53	3.58	3.50	3.77	3.64	3.51	3.50	3.64
	+0.04	+0.04	-0.03	+0.02	+0.04	+0.05	+0.01	+0.02	+0.01	+0.05	+0.06	+0.08	-0.01	+0.03	+0.04	+0.03	+0.03
Partecipation	3.46	3.47	3.37	3.44	3.59	3.38	3.53	3.44	3.38	3.43	3.45	3.34	3.74	3.53	3.39	3.42	3.49
	+0.02	+0.01	+0.03	+0.02	+0.03	+0.01	0.00	+0.03	-0.02	+0.03	0.00	+0.03	-0.06	+0.02	+0.01	-0.01	+0.04
Option Pool	3.16	3.14	3.37	3.15	3.26	3.25	2.89	3.07	3.07	3.12	3.22	3.08	3.31	3.18	3.15	3.21	3.12
	+0.02	+0.03	0.00	+0.01	+0.07	+0.03	-0.06	+0.02	-0.01	0.00	+0.03	+0.01	-0.04	+0.05	-0.02	+0.01	+0.04
Redemption Rights	3.15	3.15	3.14	3.19	3.10	3.16	3.13	3.05	3.12	3.15	3.25	3.05	3.54	3.27	3.03	3.11	3.19
	+0.01	+0.01	+0.05	0.00	+0.02	0.00	+0.06	-0.02	0.00	+0.01	+0.01	+0.03	-0.05	+0.01	+0.01	+0.01	+0.01
Vesting Provision	3.07	3.05	3.30	3.15	3.01	3.08	3.10	3.07	2.95	3.04	3.04	3.00	3.28	3.14	3.00	3.10	3.04
	+0.02	+0.02	0.00	0.00	+0.05	+0.03	+0.04	+0.02	-0.01	0.00	+0.02	+0.03	-0.04	+0.02	+0.01	+0.03	0.00
Cash Flow Rights	2.63	2.58	3.13	2.65	2.58	2.49	2.71	2.62	2.55	2.72	2.42	2.38	2.95	2.65	2.59	2.50	2.76
	+0.03	+0.04	0.00	+0.03	+0.04	+0.05	+0.05	+0.05	-0.02	+0.03	+0.04	+0.06	0.00	+0.04	+0.04	0.00	+0.07
Dividends	2.15	2.13	2.31	2.05	2.24	1.89	2.34	2.21	2.28	2.26	1.84	1.92	2.41	2.18	2.12	2.11	2.17
	+0.03	+0.04	-0.08	+0.04	+0.07	+0.02	0.00	-0.01	+0.02	+0.02	+0.02	+0.05	0.00	0.00	+0.05	+0.04	+0.03
Number of responses	451	417	34	271	118	219	95	168	110	272	113	181	74	224	227	209	242

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

As a matter of fact, VCs were also asked if they recorded a shift in bargaining power, as shown in **Table 38**. Around 25% of VCs in our sample reported to have experienced a shift toward more VC-friendly contractual terms, differently to Gompers et al. (2021) that recorded the same for only 14% of VCs. Also, around 28% experienced more entrepreneur-friendly contractual terms, while around 46% didn't perceive any change. Overall, the predominant shift given by the pandemic is towards more founder-friendly contractual terms (2.5% in excess). Looking across categories, the majority of VCs always reported no changes, but several differences are present in the perceived shifts. In fact, captive VCs experienced a greater shift towards VC-friendly contractual terms and a lower shift towards founder-friendly contractual terms with respect to independent VCs, with a predominant shift toward VC-friendly terms (net of 13.5%). Similarly, VCs negatively affected by the pandemic registered a net shift towards VC-friendly terms, differently to the ones positively affected that registered a net shift towards founder-friendly terms (+11.6%). More reputable VCs instead experienced far less than average shifts in

bargaining power (55.6%) and reported a significantly lower shift towards entrepreneur-friendly terms with respect to VCs enjoying lower reputation, with a net shift towards VCs-friendly terms (+4.9%). Furthermore, VCs located outside Europe experienced a higher shift in both categories with respect to the ones located in Europe. Concluding, large size funds differ from their counterpart as they experienced a higher shift towards VC-friendly contracts terms.

Table 38

Shifts in Bargaining Power During Negotiation

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No	46.3	46.1	48.6	47.4	44.8	45.3	47.1	44.9	47.9	44.7	50.8	49.2	55.6	43.7	49.0	51.3	42.0
Entrepreneurs	28.1	28.8	18.9	32.1	20.8	30.5	26.9	26.5	30.8	28.2	31.1	29.5	19.8	24.7	31.5	26.3	29.5
VC	25.6	25.1	32.4	20.5	34.4	24.2	26.0	28.6	21.4	27.1	18.0	21.2	24.7	31.6	19.5	22.3	28.4
Number of responses	488	451	37	293	125	236	104	185	117	291	122	193	81	247	241	224	264

5.5. Post Investment and Deal Closing

Firstly, a focus on the change in time/complexity given by the impact of the pandemic on the post-investment activities and the deal closing phase will be analysed, as shown in **Table 39** and **Table 40**. For both phases and like all the previous analysed ones, most of the VCs reported no changes, with around 46% in the post-investment phase and 55% in the deal closing one. Again, like all the other phases, there is an unbalance between those that reported a moderate/significant increase and the ones that reported a moderate/significant decrease of around 11.3% for the post-investment phase and 20.1% for the deal closing phase, thus indicating an increase in the time/complexity for such percentage of VCs in the corresponding phases. What's also interesting to note is that in deal closing, even though more VCs reported no changes, those that didn't do it were more impacted thus experiencing an increase in time/complexity. As a matter of fact, the net increase in VCs experiencing more time/complexity is second only to the valuation phase (29%). Looking at the VC typology, captive VCs reported a net decrease in the time/complexity in the post-investment phase, with a total of more than 2% of the sample taking less time to complete the phase with respect to prior the pandemic, differently to independent that instead followed the general trend. Also, VCs negatively affected by the pandemic and late-stage VCs witnessed an increase in time/complexity with respect to their counterpart in both phases, but a more severe effect is present in the post-investment phase where VCs reporting a significant increase are higher than the ones reporting a moderate increase. Furthermore, in the post-investment phase VCs located outside EU reported with a higher percentage an increase in time with respect to the ones located in

Europe (16.2% vs 5.3%). Concluding, VCs targeting low IRR and domestic ventures also reported a higher overall increase in time/complexity with respect to their counterpart in the deal closing phase.

Table 39

Time/Complexity Change in Post-Investment Activities

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	11.7	11.9	8.1	9.2	20.0	7.7	17.1	12.4	11.5	12.3	7.0	7.8	14.8	12.4	10.9	8.3	14.4
Moderately Increased	7.7	8.3	0.0	7.8	6.4	8.1	3.8	4.7	11.5	7.3	8.6	6.7	9.9	6.9	8.5	6.6	8.7
No Change	45.7	45.2	51.4	47.1	40.0	46.8	44.8	47.7	45.9	47.0	48.4	51.8	46.9	46.3	44.9	53.3	39.4
Moderately Decreased	7.1	7.0	8.1	6.1	8.8	7.7	4.8	4.1	7.4	7.0	7.0	6.2	8.6	6.6	7.7	8.7	5.8
Significantly Decreased	1.0	0.9	2.7	1.4	0.8	0.8	0.0	0.5	1.6	1.0	1.6	1.0	0.0	0.8	1.2	0.9	1.1
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

Table 40

Time/Complexity Change in Deal Closing

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Significantly Increased	7.7	7.9	5.4	4.8	14.4	6.5	11.4	8.8	8.2	8.0	3.9	8.8	4.9	8.5	6.9	7.4	7.9
Moderately Increased	25.1	24.9	27.0	27.0	23.2	23.0	31.4	23.8	22.1	26.3	21.1	25.9	24.7	23.6	26.7	24.0	26.0
No Change	54.5	54.6	54.1	56.3	48.0	59.7	46.7	58.0	54.9	53.0	60.9	51.8	56.8	56.4	52.6	58.5	51.3
Moderately Decreased	10.7	10.7	10.8	10.2	10.4	10.5	8.6	7.8	11.5	11.3	10.9	11.4	12.3	10.0	11.3	8.3	12.6
Significantly Decreased	2.0	1.9	2.7	1.7	4.0	0.4	1.9	1.6	3.3	1.3	3.1	2.1	1.2	1.5	2.4	1.7	2.2
Number of responses	506	469	37	293	125	248	105	193	122	300	128	193	81	259	247	229	277

By first looking at the number of interactions between VC firms and their portfolio companies prior to the pandemic, most VCs firms reported to meet them with a frequency of 2-3 times a month (33.1%) and once a week (20.5%). Applying a McNemar test (see **Figure 26** in the appendix for the answers' frequency in detail), a statistically significant change is present in multiple times a week (p-value: 0.00%), once a week (p-value: 0.00%), 2-3 times a month (p-value: 0.39%), once a month (p-value: 0.005) and less than once a month (p-value: 1.56%). It is in fact evident an increase in frequency of interactions with portfolio companies, with a considerable increase of interactions done multiple times a week and a respective decrease in once-a-month interactions. This is obviously the result of the peculiar period that dramatically increased the need of guidance for ventures due to the high uncertainty, but it can also be a consequence of the teleworking practice that made it easier to meet and interact even from home. In any case, the same pattern is consistent across all the different subgroups, with differences in the magnitude of the shifts. For instance, Captive VCs increased their interactions but only up to once a week, differently to IVCs that principally increased interactions to multiple times a week. Also, VCs negatively affected by the pandemic increased more the multiple times a week interaction with respect to their counterpart,

highlighting the need of ventures to be assisted in difficult situations. Late-stage VCs are the ones that increased the most the interactions done multiple times a week, arriving at 37.5% of the sample doing so. These results seem to be coherent with the findings of Gompers et al. (2021), that reported the 49% of VCs to interact at least once a week after the pandemic, similarly to the 45.1% of the sample to meet with the same frequency reported in the study.

Table 41

Interaction with Portfolio Companies Frequency

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Every Day	0.8	0.9	0.0	0.7	0.8	0.4	1.9	0.5	1.7	0.3	1.7	1.6	1.2	0.4	1.3	1.3	0.4
	+0.2	+0.2	0.0	+0.3	+0.8	0.0	+1.0	0.0	0.0	+0.4	0.0	-0.6	0.0	0.0	+0.4	0.0	+0.4
Multiple Times a Week	11.8	12.6	2.7	13.0	7.2	12.1	22.1	12.1	8.5	11.1	14.2	9.3	17.3	11.5	12.1	13.5	10.4
	+9.1	+9.8	0.0	+6.8	+12.8	+4.7	+15.4	+13.7	+6.0	+9.0	+5.8	+13.0	+3.7	+7.8	+10.5	+6.7	+11.1
Once a Week	20.5	21.7	5.4	23.2	19.2	16.8	22.1	21.4	19.7	21.9	16.7	26.9	18.5	18.0	23.0	20.2	20.8
	+2.7	+2.1	+10.8	+2.4	+5.6	+6.9	-5.8	+3.9	+3.4	-0.4	+6.6	-1.0	+9.9	+3.7	+1.7	+5.4	+0.4
2-3 Times a Month	33.1	33.4	29.7	29.7	38.4	33.2	33.7	37.9	33.3	32.6	31.7	34.2	29.6	30.3	36.0	36.3	30.4
	-1.8	-2.5	+5.4	-1.0	-4.0	-0.9	-5.8	-9.3	-0.8	+2.8	-4.2	-2.1	-2.4	-2.8	-0.9	-4.0	0.0
Once a Month	26.7	25.3	43.2	27.0	26.4	27.6	18.3	23.6	27.4	26.7	30.0	22.3	29.6	29.1	24.3	25.1	28.1
	-8.5	-8.5	-8.1	-6.5	-12.8	-9.5	-4.8	-9.3	-4.3	-9.3	-8.3	-6.8	-9.8	-6.6	-10.5	-7.6	-9.3
Less Than Once a Month	6.8	5.8	18.9	6.5	7.2	9.5	1.9	4.4	8.5	6.9	5.8	5.2	3.7	10.2	3.3	3.6	9.6
	-1.4	-0.9	-8.1	-2.1	-1.6	-0.9	0.0	+1.1	-3.4	-2.0	0.0	-2.1	-1.2	-1.6	-1.2	-0.5	-2.3
Never	0.2	0.2	0.0	0.0	0.8	0.4	0.0	0.0	0.9	0.3	0.0	0.5	0.0	0.4	0.0	0.0	0.4
	-0.2	-0.2	0.0	0.0	-0.8	-0.4	0.0	0.0	-0.9	-0.3	0.0	-0.5	0.0	-0.4	0.0	0.0	-0.4
Number of responses	483	446	37	293	125	232	104	182	117	288	120	193	81	244	239	223	260

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

A focus on the typology of interactions is given in **Table 42**, where VCs reported the frequency of each value-added activity indicated. The most frequent value-added activity conducted is to provide strategic guidance, followed by the creation of connections with potential investors. The same pattern is present across all the subgroups, except that captive and early-stage VCs connect companies with potential investors more frequently than they provide strategic guidance. Also, late-stage VCs don't give that much importance to the creation of connections with potential investors as logically the venture is more mature and doesn't need many additional rounds of investment. The last frequent activity conducted for all the different subgroups is to hire employees. Applying a Wilcoxon signed-rank test, all the activities listed in the table resulted with a statistically significant change in the frequency after the pandemic with respect to the period prior to the outbreak (p-values: 0.00%, see **Figure *27*** in the appendix for the answers' frequency in detail). Overall, the frequency of all the activities increased after the pandemic, in coherence with the fact that the frequency of interactions previously shown in **Table 41** also increased. The greatest increase is present in the value-added activity that consist in providing operational guidance, followed by

the help to reach additional financial resources and the providing of strategic guidance. These activities are deeply related to the uncertainty given by the pandemic that created the necessity to further assist the portfolio companies to sustain their growth. Looking across the different subgroups, the increments seem to be similar, with IVCs that helped more than captive VCs in hiring personnel, early-stage VCs that increased more the assistance in strategic guidance while the late-stage ones did the same for the assistance in operational guidance. Also, VCs targeting domestic ventures and the ones located outside Europe increased more their frequency in all the activities with respect to their counterparts, and VCs targeting low IRR increased more the assistance in operational guidance.

Table 42

Frequency of Value-Added Activities

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Provide Strategic Guidance	4.24	4.26	4.03	4.27	4.31	4.21	4.28	4.24	4.28	4.20	4.29	4.19	4.40	4.20	4.28	4.25	4.23
	+0.23	+0.23	+0.21	+0.21	+0.21	+0.26	+0.18	+0.23	+0.13	+0.24	+0.21	+0.20	+0.18	+0.24	+0.22	+0.17	+0.28
Connect Companies with Potential Investors	4.06	4.05	4.16	4.06	4.17	4.25	3.32	4.00	4.16	3.95	4.22	3.95	4.35	4.14	3.97	3.98	4.12
	+0.21	+0.21	+0.25	+0.21	+0.24	+0.21	+0.19	+0.25	+0.14	+0.22	+0.18	+0.18	+0.16	+0.20	+0.22	+0.20	+0.22
Help Companies to Reach Additional Financial Resources	3.84	3.84	3.92	3.83	3.90	3.75	3.88	3.77	3.81	3.83	3.82	3.85	4.11	3.87	3.82	3.87	3.82
	+0.25	+0.24	+0.27	+0.22	+0.26	+0.24	+0.28	+0.25	+0.24	+0.26	+0.25	+0.16	+0.23	+0.24	+0.25	+0.27	+0.23
Connect Companies with Potential Customers / Suppliers / Strategic Partners	3.79	3.78	3.92	3.84	3.82	3.82	3.62	3.73	3.91	3.71	3.82	3.73	4.03	3.84	3.74	3.69	3.88
	+0.15	+0.16	+0.08	+0.16	+0.14	+0.15	+0.13	+0.18	+0.09	+0.17	+0.10	+0.15	+0.07	+0.16	+0.14	+0.09	+0.20
Hire Board Membres	3.61	3.61	3.51	3.64	3.58	3.41	3.82	3.56	3.46	3.59	3.59	3.65	4.03	3.51	3.70	3.69	3.53
	+0.10	+0.10	+0.09	+0.09	+0.11	+0.08	+0.11	+0.11	+0.08	+0.11	+0.07	+0.05	+0.11	+0.08	+0.12	+0.09	+0.11
Hire Managers	3.55	3.59	3.06	3.58	3.55	3.50	3.64	3.47	3.59	3.46	3.62	3.61	3.87	3.46	3.64	3.57	3.53
	+0.16	+0.17	+0.05	+0.15	+0.18	+0.14	+0.17	+0.22	+0.05	+0.16	+0.16	+0.13	+0.21	+0.16	+0.17	+0.12	+0.20
Provide Operational Guidance	3.36	3.37	3.29	3.40	3.30	3.32	3.37	3.44	3.20	3.28	3.55	3.35	3.47	3.36	3.36	3.29	3.43
	+0.26	+0.26	+0.25	+0.26	+0.30	+0.23	+0.30	+0.29	+0.19	+0.30	+0.15	+0.21	+0.23	+0.23	+0.29	+0.18	+0.32
Hire Employees	2.70	2.72	2.53	2.77	2.61	2.77	2.43	2.69	2.59	2.54	2.92	2.79	3.01	2.65	2.76	2.62	2.78
	+0.16	+0.16	+0.06	+0.16	+0.14	+0.13	+0.12	+0.21	+0.07	+0.16	+0.17	+0.10	+0.20	+0.18	+0.14	+0.12	+0.18
Number of responses	444	410	34	268	119	219	94	168	103	260	113	181	76	223	221	203	241

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

VCs were also asked to indicate the frequency with which they experienced the listed exit types from their investments, as shown in **Table 43**. The most common type of exit for the sample is the sale to an industrial player, followed with a big margin by the sale to PE that even if second has a value lower than 3, that indicate a less than average frequency, then the third is the IPO, followed by the write-off and lastly the management buyout. The trend is similar across all the different subgroups, with captive VCs that exit more frequently through write-off than IVCs, late-stage VCs that exit with a very higher frequency through sale to PE and a higher frequency in sale to an industrial player and management buyout compared to the early-stage ones that instead experience more write-offs. Also, more reputable VCs experienced all the different types of exits more than the less reputable ones, and VCs located outside

EU experienced more IPO than the ones located in EU that instead exited more through the sale to an industrial player. Applying a Wilcoxon signed-rank test (see **Figure 28** in the appendix for the answers' frequency in detail), a statistically significant change due to the pandemic in the frequency of exits is present in the IPO (p-value: 0.00%), sale to an industrial player (p-value: 0.81%), sale to PE (p-value: 0.00%), and write-off (p-value: 0.00%). Indeed, the exit through IPO increased dramatically, due to the record-breaking year in IPOs that witnessed the VC market, as shown by Baig & Chen (2021), and even the sale to PE and write-off witnessed a significant increase. Again, the trend seems constant across all the subgroups with some differences in magnitude. Captive VCs reported a significant increase in IPO, almost double to IVCs that still experienced a big increase, and also a decrease in management buyout. VCs negatively affected by the pandemic logically experienced a higher increase in write-off and management buyout compared to their counterpart, early-stage VCs experienced more sales to PE and to an industrial player with respect to late-stage ones that instead experienced more IPO, write-off and management buyout. More reputable VCs experienced more exits through management buyout than less reputable one that instead exited more through write-off.

Table 43

Exit Type Frequency

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Sale to an Industrial Player	3.92	3.91	3.94	3.90	3.83	3.83	4.14	3.98	3.91	3.88	3.99	3.81	4.40	3.87	3.96	4.02	3.82
	+0.06	+0.07	+0.03	+0.08	+0.09	+0.08	0.00	+0.07	+0.08	+0.08	+0.11	+0.04	+0.09	+0.08	+0.05	+0.05	+0.09
Sale to Private Equity	2.95	2.95	3.03	2.93	3.00	2.64	3.53	3.04	2.96	3.03	2.90	2.88	3.11	2.85	3.03	2.98	2.93
	+0.17	+0.17	0.00	+0.19	+0.10	+0.18	+0.05	+0.14	+0.14	+0.14	+0.15	+0.16	+0.15	+0.11	+0.21	+0.13	+0.19
IPO	2.65	2.65	2.68	2.65	2.70	2.51	2.46	2.43	2.80	2.62	2.78	-	-	2.51	2.75	2.49	2.80
	+0.40	+0.37	+0.68	+0.41	+0.32	+0.32	+0.41	+0.35	+0.38	+0.39	+0.37			+0.28	+0.46	+0.37	+0.41
Write-off	2.16	2.12	2.52	2.09	2.20	2.33	1.72	2.19	2.15	2.16	2.23	2.01	2.54	2.26	2.06	2.26	2.07
	+0.17	+0.16	+0.27	+0.14	+0.29	+0.11	+0.17	+0.14	+0.12	+0.21	+0.12	+0.17	+0.05	+0.20	+0.16	+0.14	+0.20
Management Buyout	2.06	2.06	2.04	2.12	1.97	1.77	2.32	2.14	1.93	2.13	1.97	1.88	2.43	2.15	1.98	2.13	1.97
	+0.03	+0.04	-0.08	+0.01	+0.07	0.00	+0.05	+0.04	-0.04	+0.03	+0.02	0.00	+0.16	0.00	+0.06	0.00	+0.07
Number of responses	353	325	28	217	90	150	83	129	85	207	94	193	81	140	213	169	184

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

To conclude this section, VCs were asked if they were impacted in terms of exit time, i.e., they had to change the planned time of exit due to the pandemic. As shown in **Table 44**, almost 60% of the sample answered negatively, with a similar distribution across all the subgroups. The majority of the VCs negatively impacted by the pandemic actually reported to have changed their exit time decisions (51.2% answered yes), differently to their counterpart that for more than 60% answered to have not changed them. A similar trend is noticeable also between early-stage VCs that for the vast majority (68.5%) declared no impact in terms of exit time while a similar percentage (67.3%) declared the opposite within

late-stage VCs. Additionally, also VCs doing cross-border investments, the ones targeting high IRR and small size funds seem to have been less impacted than the average with around 60% of the sample not reporting changes.

Table 44

VCs Impacted by COVID-19 in Terms of Exit Time

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
No	57.6	57.2	62.2	61.4	48.8	68.5	32.7	54.9	64.1	55.9	60.0	57.0	55.6	61.9	53.1	59.2	56.2
Yes	42.4	42.8	37.8	38.6	51.2	31.5	67.3	45.1	35.9	44.1	40.0	43.0	44.4	38.1	46.9	40.8	43.8
Number of responses	483	446	37	293	125	232	104	182	117	288	120	193	81	244	239	223	260

5.6. Syndication

To conclude the analysis a section dedicated to the practice of syndication has been included. Firstly, VCs reported the percentage of their investments done using syndication, both before and after the COVID-19 outbreak. Prior to the pandemic an average of 56.3% of the total investments were syndicated, with a similar ratio also across the different subgroups, except for captive VCs that reported a higher average of 76.6% and late-stage VCs that reported a very low average of 32.7% with a median of 20%, indicating that for this last type of VCs syndication is less common practice. Applying a paired t-test, the difference in the mean between the pre and post distribution resulted statistically significant (p-value: 0.00%), confirming a change of habit syndicating investments. Indeed, the average increased (+2.1%) after the pandemic, confirming the findings of Bellavitis et al. (2021) which detected the tendency of VCs to increase the percentage of syndicated investments during the pandemic, to share the associated risks. A similar percentage increase is present across all the different subgroups, with captive VCs, the ones negatively affected and late-stage VCs that even increased their average of around 3.5%, while VCs targeting high IRR increased it only by 0.7%.

Table 45

Percentage of Syndicated Investments

			Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
		All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Before	μ	56.3	54.6	76.6	59.0	52.1	60.8	32.7	52.6	58.9	55.5	61.3	55.2	59.0	53.6	59.0	58.6	54.3
	σ	38.0	38.0	33.0	37.6	38.8	36.9	34.1	39.6	36.6	39.0	33.5	38.3	34.7	38.9	37.1	37.8	38.2
	25%	20.0	20.0	65.0	20.0	10.0	20.0	0.0	10.0	25.0	15.0	30.0	20.0	25.0	15.0	20.0	20.0	20.0
	50%	60.0	60.0	100.0	70.0	50.0	75.0	20.0	50.0	65.0	60.0	70.0	60.0	55.0	50.0	75.0	70.0	50.0
	75%	95.0	90.0	100.0	100.0	90.0	100.0	50.0	90.0	100.0	100.0	90.0	95.0	90.0	91.3	95.0	100.0	90.0
After	μ	58.4	56.6	80.3	60.4	55.8	62.3	36.2	54.6	61.3	57.9	62.0	57.9	60.1	56.2	60.6	61.1	56.0
	σ	38.2	38.3	28.7	37.5	39.6	37.4	34.7	40.1	36.6	38.8	35.2	38.0	34.9	39.7	36.5	37.0	39.1
	25%	20.0	20.0	65.0	25.0	20.0	30.0	0.0	15.0	30.0	20.0	33.0	25.0	30.0	20.0	25.0	28.8	20.0
	50%	70.0	60.0	100.0	70.0	60.0	75.0	25.0	60.0	70.0	70.0	75.0	60.0	70.0	60.0	75.0	72.5	60.0
	75%	100.0	99.5	100.0	100.0	100.0	100.0	60.0	99.0	100.0	100.0	98.0	100.0	90.0	100.0	100.0	100.0	100.0
Number of responses		465	430	35	290	125	228	95	175	114	276	117	185	80	236	229	216	249

Going further, VCs were asked to indicate the importance to some listed reasons that usually are considered while deciding to syndicate a deal, as shown in **Table 46**. The most important factor reported is "complementary expertise/access to valuable resources", followed by "capital constraints" and "risk sharing", with "gain of a platform for organizational learning" as less important.

This same pattern is consistent across all the different subgroups, with the exception of captive VCs that give more importance to "risk sharing" and "better manage investment targets under uncertainty" than "capital constraints"; late-stage VCs that have as most important factor "capital constraints"; VCs targeting low IRR that attribute the same importance to "capital constraints" and "risk sharing" and lastly more reputable VCs that consider "desire to be invited in future rounds" as second most important factor after "complementary expertise". Applying a Wilcoxon signed-rank test (see **Figure *29*** in the appendix for the answers' frequency in detail) a statistically significant change between the pre and post COVID-19 importance is present in: complementary expertise/access to valuable resources (p-value: 0.00%), capital constraints (p-value: 0.00%), risk sharing (p-value: 0.00%), desire to be invited to future rounds (p-value: 0.00%), increase deal flow (p-value: 0.01%), better manage investments targets under uncertainty (p-value: 0.00%), desire to increase reputation (p-value: 3.97%) and improve negotiation power/reduce agency costs with entrepreneurs (p-value: 3.24%). Indeed, the importance of all the factors increased except for "gain a platform for organizational learning" that remained constant. The highest increase is in "complementary expertise/access to valuable resources" and "better manage investments targets under uncertainty", clearly showing the need of VCs to improve their decision making during this critical phase. It is also interesting to notice that VCs negatively affected by the pandemic increase the importance in all the different factors with a higher magnitude with respect to the ones positively affected, especially for "risk sharing", clearly showing the difficulties encountered by such types of VCs. Similarly, VCs targeting domestic ventures also increased their importance in all the factors with a higher magnitude with respect to the ones doing cross-border investments. Concluding, more reputable VCs greatly

increased their importance in "capital constraints" as a reason to syndicate, even compared to the less reputable VCs, showing their difficulty and need to access capital during this crisis period.

Table 46

Relevance of Reasons to Syndicated a Deal

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Complementary Expertise / Access to Valuable Resources	3.79	3.76	4.06	3.78	3.76	3.85	3.45	3.65	3.76	3.80	3.80	3.71	3.97	3.80	3.77	3.79	3.79
	+0.14	+0.15	+0.05	+0.11	+0.23	+0.14	+0.14	+0.21	+0.09	+0.14	+0.12	+0.14	+0.12	+0.14	+0.14	+0.08	+0.19
Capital Constraints	3.43	3.44	3.37	3.38	3.56	3.40	3.58	3.43	3.52	3.43	3.47	3.36	3.53	3.44	3.43	3.42	3.44
	+0.12	+0.13	+0.03	+0.10	+0.17	+0.10	+0.04	+0.16	+0.04	+0.11	+0.14	+0.09	+0.23	+0.10	+0.13	+0.04	+0.20
Risk Sharing	3.33	3.27	4.00	3.26	3.45	3.32	3.15	3.29	3.30	3.43	3.23	3.22	3.44	3.35	3.32	3.37	3.30
	+0.12	+0.12	+0.03	+0.07	+0.24	+0.07	+0.17	+0.16	+0.09	+0.13	+0.09	+0.08	+0.05	+0.12	+0.10	+0.09	+0.14
Desire to be Invited to Future Rounds	3.11	3.13	2.94	3.05	3.31	3.08	2.90	3.03	3.10	3.10	3.14	2.90	3.59	3.12	3.11	3.04	3.17
	+0.08	+0.08	+0.03	+0.07	+0.15	+0.06	+0.10	+0.09	+0.05	+0.08	+0.06	+0.06	+0.03	+0.09	+0.06	+0.09	+0.07
Increase Deal Flow	2.96	2.96	2.94	3.00	2.94	2.92	2.71	3.03	2.83	3.02	2.98	2.74	3.19	2.97	2.95	2.79	3.11
	+0.07	+0.08	0.00	+0.07	+0.13	+0.10	+0.06	+0.09	+0.04	+0.07	+0.07	+0.03	+0.03	+0.09	+0.05	+0.07	+0.08
Better Manage Investment Targets Under Uncertainty	2.98	2.94	3.44	2.95	3.07	2.93	2.83	2.84	3.14	3.07	2.98	2.83	3.23	3.02	2.95	2.94	3.02
	+0.13	+0.13	+0.12	+0.11	+0.24	+0.12	+0.07	+0.15	+0.06	+0.12	+0.18	+0.11	+0.16	+0.11	+0.15	+0.06	+0.20
Desire to Increase Reputation	2.86	2.88	2.65	2.80	3.09	2.81	2.67	2.83	2.83	2.81	3.03	2.64	3.22	2.86	2.86	2.74	2.97
	+0.04	+0.05	-0.03	+0.05	+0.06	+0.04	+0.03	+0.04	-0.01	+0.04	+0.03	+0.03	-0.02	+0.06	+0.02	+0.03	+0.05
Improve Negotiation Power / Reduce Agency Costs with Entrepreneurs	2.71	2.70	2.80	2.70	2.77	2.51	2.73	2.66	2.78	2.70	2.75	2.54	3.04	2.68	2.73	2.50	2.90
	+0.03	+0.04	-0.03	+0.03	+0.09	+0.05	0.00	+0.09	+0.02	0.00	+0.08	+0.01	+0.03	+0.05	+0.02	-0.01	+0.07
Gain a Platform for Organizational Learning	2.39	2.40	2.21	2.31	2.69	2.24	2.31	2.43	2.31	2.32	2.52	2.25	2.80	2.43	2.34	2.29	2.47
	0.00	+0.02	-0.07	0.00	+0.01	+0.01	-0.07	-0.04	-0.01	+0.01	+0.01	+0.04	-0.03	+0.02	-0.01	+0.03	-0.01
Number of responses	395	360	35	242	110	195	77	144	98	237	103	161	70	200	195	189	206

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

To have a broader view on syndication, a last question was asked to VCs regarding the importance attributed to some listed reasons while choosing a syndicate partner or co-investor. The most important factor reported is the sector specialization, closely followed by reputation and the partner's track record. The less important factors are the mutual social connection and geographic location, that maintain a neutral degree of importance (3/5). Applying a Wilcoxon signed-rank test (see **Figure *30*** in the appendix for the answers' frequency in detail) a statistically significant change in importance after the pandemic outbreak is present in: sector specialization (p-value: 0.00%), reputation (0.00%), partner's track record (p-value: 0.01%), capital availability size (p-value: 0.00%) and past success together (p-value: 0.02%). Indeed, an increment in importance in all the factors is present, even if mutual social connection (p-value: 5.50%) and mutual social connection (p-value: 18.72%) are not statistically significant. The highest increase is present in the capital availability size factor, followed by sector specialization and reputation. Looking across subgroups, the classification of importance and relative increments seem to be consistent with some exceptions. Indeed, captive VCs give the most importance to the capital availability size and attributes more importance to geographic location with respect to IVCs; VCs positively affected by the

pandemic considered reputation the most important factor prior to the pandemic to then switch to sector specialization (similarly to VCs targeting low IRR and large size funds), while VCs negatively affected attributed more importance to sector specialization to then change with capital availability size (+0.18 increase) followed by reputation; late-stage VCs give way less importance to sector specialization compared to early-stage VCs and in fact they consider as most important factor reputation followed by partner's track record; more reputable VCs attributes more importance to all the different factors with respect to the less reputable ones.

Table 47

Relevance of Reasons to Choose a Syndicate Partner

		Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
	All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Sector Specialization	4.05	4.05	4.09	4.06	4.01	4.10	3.69	3.94	4.11	4.04	4.16	3.93	4.47	4.05	4.05	4.08	4.03
	+0.08	+0.08	0.00	+0.09	+0.07	+0.07	+0.10	+0.08	-0.02	+0.07	+0.06	+0.06	-0.02	+0.08	+0.07	+0.04	+0.11
Reputation	4.02	4.03	4.00	4.08	3.95	4.02	4.08	3.95	4.08	4.08	3.98	3.97	4.28	3.99	4.06	4.02	4.03
	+0.08	+0.08	+0.03	+0.06	+0.14	+0.09	0.00	+0.07	+0.04	+0.08	+0.06	+0.08	+0.01	+0.13	+0.02	+0.04	+0.10
Partner's Track Record	3.91	3.91	3.82	3.92	3.86	3.91	3.86	3.78	3.91	3.94	3.88	3.86	4.11	3.98	3.83	3.92	3.89
	+0.07	+0.08	-0.03	+0.07	+0.10	+0.10	+0.05	+0.10	+0.02	+0.10	+0.06	+0.07	+0.01	+0.08	+0.07	+0.06	+0.08
Capital Availability Size	3.76	3.73	4.15	3.68	3.93	3.66	3.81	3.72	3.72	3.77	3.67	3.61	4.15	3.72	3.80	3.81	3.72
	+0.13	+0.14	+0.03	+0.13	+0.18	+0.12	+0.05	+0.11	+0.16	+0.15	+0.12	+0.11	+0.09	+0.13	+0.13	+0.07	+0.18
Past Success Together	3.58	3.59	3.48	3.52	3.73	3.59	3.47	3.59	3.64	3.55	3.68	3.57	3.92	3.49	3.67	3.49	3.66
	+0.07	+0.07	+0.04	+0.07	+0.09	+0.05	+0.04	+0.09	0.00	+0.09	+0.04	+0.10	+0.05	+0.05	+0.08	+0.05	+0.08
Mutual Social Connection	3.03	3.03	3.03	3.05	3.10	2.96	2.92	3.01	3.01	3.11	3.00	3.01	3.36	2.99	3.07	3.11	2.96
	+0.02	+0.02	+0.03	+0.01	+0.06	+0.01	-0.04	+0.04	0.00	+0.02	+0.02	0.00	+0.06	+0.03	+0.01	0.00	+0.04
Geographic Location	3.02	2.98	3.48	2.92	3.23	3.04	2.74	2.79	3.11	3.00	3.11	2.91	3.19	3.04	3.00	3.16	2.90
	+0.04	+0.03	+0.10	+0.05	+0.04	-0.06	+0.07	+0.05	+0.01	+0.04	+0.03	+0.03	+0.07	+0.01	+0.06	+0.02	+0.05
Number of responses	425	391	34	268	115	212	78	155	108	249	110	169	74	213	212	197	228

Note. 1st row: before the COVID-19 outbreak; 2nd row: after the COVID-19 outbreak

To conclude the analysis, VCs were asked to indicate in which percentages their portfolio companies were affected by the COVID-19 pandemic. VCs reported an average of almost 61% of their portfolio companies to actually have benefited from the pandemic or to not have suffered any impact, around 30% of their companies to have experienced a negative effect and the remaining 9% to have suffered a severely negative impact. Similar percentages are present across all the subgroups, with captive VCs that reported a greater average of companies severely affected by the pandemic and late-stage VCs, large size funds and VCs targeting high IRR that seem to have enjoyed a higher percentage of companies positively affected or not affected, with respect to their counterparts and the general average. Comparing the results with the findings of Gompers et al. (2021), they seem to be placed in between the percentages observed in July 2020 (52%, 38%, 10%) and the ones of July 2021 (70%, 24%, 6%), but still showing a similar distribution. Note that the data has been gathered in the period May-November 2021. Additionally, in

Figure 14 it is possible to visualise the percentage distributions for each category through a density plot that shows on the y-axis the probability that a variable assumes a certain value.

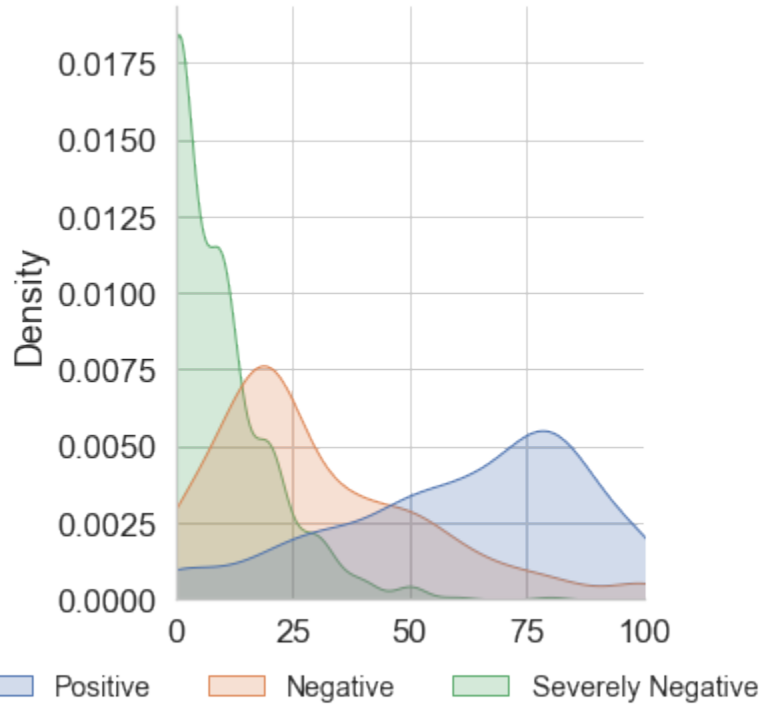
Table 48

Percentage of Portfolio Companies Affected by the COVID-19

			Type		COVID Impact		Stage		Geography		IRR		IPO Rate		Fund Size		Location	
		All	Ind.	Cap.	Positive	Negative	Early	Late	Domestic	Cross	Low	High	Low	High	Small	Large	EU	Rest
Positive	μ	60.7	61.0	58.1	78.0	-	60.8	62.7	60.3	59.6	59.9	65.4	59.3	61.3	57.9	63.6	60.5	61.0
	σ	26.6	26.9	22.6	12.3	-	27.4	26.3	28.5	25.5	25.6	25.6	26.6	24.9	29.0	23.7	25.9	27.3
	25%	40.5	42.8	40.0	70.0	-	48.8	50.0	40.0	40.0	41.5	50.0	40.0	50.0	40.0	50.0	45.0	40.0
	50%	68.2	70.0	57.5	80.0	-	70.0	70.0	70.0	60.0	60.0	70.0	62.5	70.0	60.0	70.0	60.0	70.0
	75%	80.0	80.0	80.0	85.0	-	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Negative	μ	30.2	30.3	28.6	-	59.1	29.8	29.1	30.6	31.8	30.8	26.6	31.4	27.8	32.0	28.4	30.7	29.8
	σ	23.2	23.4	20.7	-	20.7	24.9	20.9	24.8	22.8	22.7	20.9	23.4	20.8	25.8	20.1	23.1	23.3
	25%	15.0	15.0	10.0	-	50.0	14.5	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	15.0	15.0	15.0
	50%	20.0	20.0	20.0	-	60.0	20.0	20.0	20.0	25.0	25.0	20.0	25.0	20.0	25.0	20.0	20.0	20.0
	75%	40.0	40.0	42.5	-	70.0	40.0	40.0	47.5	45.0	40.0	35.0	40.0	40.0	50.0	40.0	40.0	50.0
Severely Negative	μ	9.0	8.7	13.3	-	16.6	9.4	8.3	9.1	8.6	9.3	7.9	9.3	10.9	10.1	8.0	8.8	9.2
	σ	11.3	11.0	14.1	-	15.0	12.1	10.6	11.3	11.0	11.8	9.6	10.8	13.9	12.9	9.3	11.4	11.2
	25%	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50%	5.0	5.0	10.0	-	20.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.5	5.0	5.0	5.0	5.0
	75%	13.0	10.0	20.0	-	25.0	15.0	10.0	15.0	10.0	15.0	10.0	15.0	17.8	15.0	10.0	10.0	15.0
Number of responses		466	430	36	293	125	228	95	175	113	276	117	186	80	235	231	217	249

Figure 14

Percentage of Portfolio Companies Affected by the COVID-19: Density Plot



6. Conclusions

After two years from the COVID-19 outbreak, a more mature and critical view about the effects that it created and the consequent reaction of the economic environment to adapt to such a new reality is approachable. Despite the initial months after the pandemic outbreak greatly disrupted the Venture Capital ecosystem and the general economic environment as a whole, a great and fast recovery started to begin after around 3 months from the outbreak, leading the 2020 and 2021 to become record-setting years for the VC industry. As a matter of fact, $200 billion was raised by VC funds during 2021, the second highest amount ever recorded, altogether with the highest amount of capital ever raised through investment exits that reached $1,400 billion dollars, mostly thanks to a record-breaking year for IPOs, confirming the solidity of the VC market.

Also, from a high-level perspective, non-disruptive changes have been detected in investment strategies and practices adopted by VCs as a reaction to the COVID-19 outbreak, differently to what was initially thought due to the introduction of lockdowns and social distancing measures.

Specifically, first looking at *structural changes*, a little majority of VCs changed their investment strategies during this period, with an overall time to complete the deal that increased for 15% of VCs and the targeted venture stage that shifted towards mature ventures with an overall increase of investments in all the stages. Considering the targeted industry, a shift towards pandemic related industries has been observed, with the healthcare industry increasing the most and the retailing/distribution and the data & software services industries decreasing the most, also contrary to the findings of Bellavitis et al. (2021) no shift towards domestic investments has been detected and an increase in investments in ventures located in Europe has been registered. As for the time and complexity in conducting the different investment phases, even if for half of the VCs no changes were reported, a considerable percentage of them witnessed an increase, especially in the valuation and deal closing phase.

For what concerns the *deal sourcing* phase, the most important deal source reported is the "management of the VC firm", that remained so even after the pandemic outbreak, while the deal source which gained more importance in this period is the "usage of other VC firms or angels", highlighting the need to syndicate deals and share the investment risks.

In the *deal selection* phase, the most important factors reported while deciding whether to invest or not in a venture are its management team and its business model, that, again, remained the most important factors even after the pandemic outbreak. The highest increases in importance reported are in the "possibility to obtain public financial incentives" and the "favourable economic environment" factors, which are very related and highlight the sensitivity of VCs to the surrounding economic conditions.

Additionally, VCs also decreased their reliance in "gut decisions", evidencing a decrease in confidence in decision-making induced by the pandemic.

Looking at the *valuation* phase, VCs reported as the most used metric the IRR alongside the cash-on-cash, with the pandemic that induced an increase in alternative types of metrics with respect to the most common ones but still maintained the two metrics as the most used ones. Also, the most common target IRR of the funds reported is in the 20-29% range, with the pandemic that induced a general decrease on the targeted IRR with some exceptions like early-stage VCs that actually increased their required IRR. For what pertain the rate of return, the most widely targeted one is the risk-adjusted market rate of return, while the most important factors while evaluating a company are the "anticipated exit" and the "valuation of comparable investments", with the pandemic that induced an increase in importance in the "anticipated exit" and "competitive pressure from other VCs". Additionally, an increase in the valuation of ventures have been registered mostly inside the range of 20%, with some adjustments done for the majority of VCs for embryonic ventures and due to the cash flow projections. For what pertains the target multiple and the cash-on-cash multiple, the most common one is the 3-4x, with the majority of VCs that reported a target multiple in the 2-3x to 5-6x range and early-stage VCs that have as most common target multiple at least 9-10x, furthermore the pandemic induced a sensible shift towards higher multiples.

Looking at the *deal structuring* phase, due diligence resulted the most impacted factor by the pandemic for the majority of VCs. The most important contractual features reported are "valuation" and "board rights", with an increase in importance in all the different features as a consequence of the pandemic, and overall, a slight shift towards more founder-friendly contractual terms.

Also, in the *post-investment* phase the pandemic induced VC firms to dramatically increase the frequency with which they interact with their portfolio companies, with a significant increase in multiple times a week interaction. The most frequent value-added activity reported is "provide strategic guidance", while "provide operational guidance" is the one that increased its frequency the most during the pandemic, highlighting the need of VCs to closely follow their portfolio companies to help them during this uncertain period.

Regarding the *deal closing* phase, the most common type of exit reported is the sale to an industrial player, while the one that increased the most is the IPO in line with the record-breaking year for the VC market previously described. Furthermore, no significant impact of the pandemic has been registered in the planned time to exit.

Concluding, VCs increased the use of the practice of *syndication* as a response to the pandemic, reporting as most important reason to syndicate a deal the "complementarity expertise/access to valuable resources" and increasing the relative importance of all the different investigated reasons to syndicate as

reaction to the pandemic. Furthermore, while choosing a syndicate partner, VCs reported as the most important factor the "sector specialization" with the highest reported increase in importance in the "capital availability size" of the partner.

Overall, the impact of the pandemic on VCs has decreased over time, as a matter-of-fact VCs reported that around 60% of their portfolio companies were unaffected or positively affected by the pandemic.

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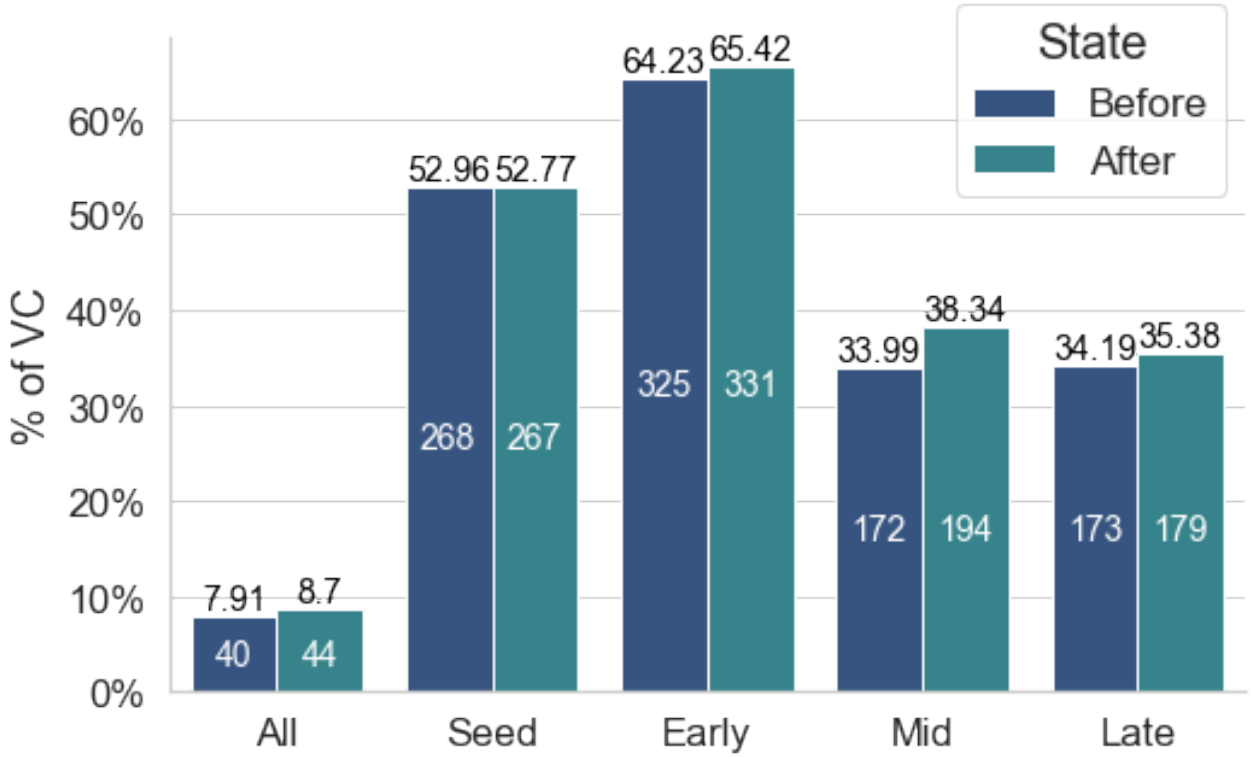
Appendix A: Charts

Figure 15

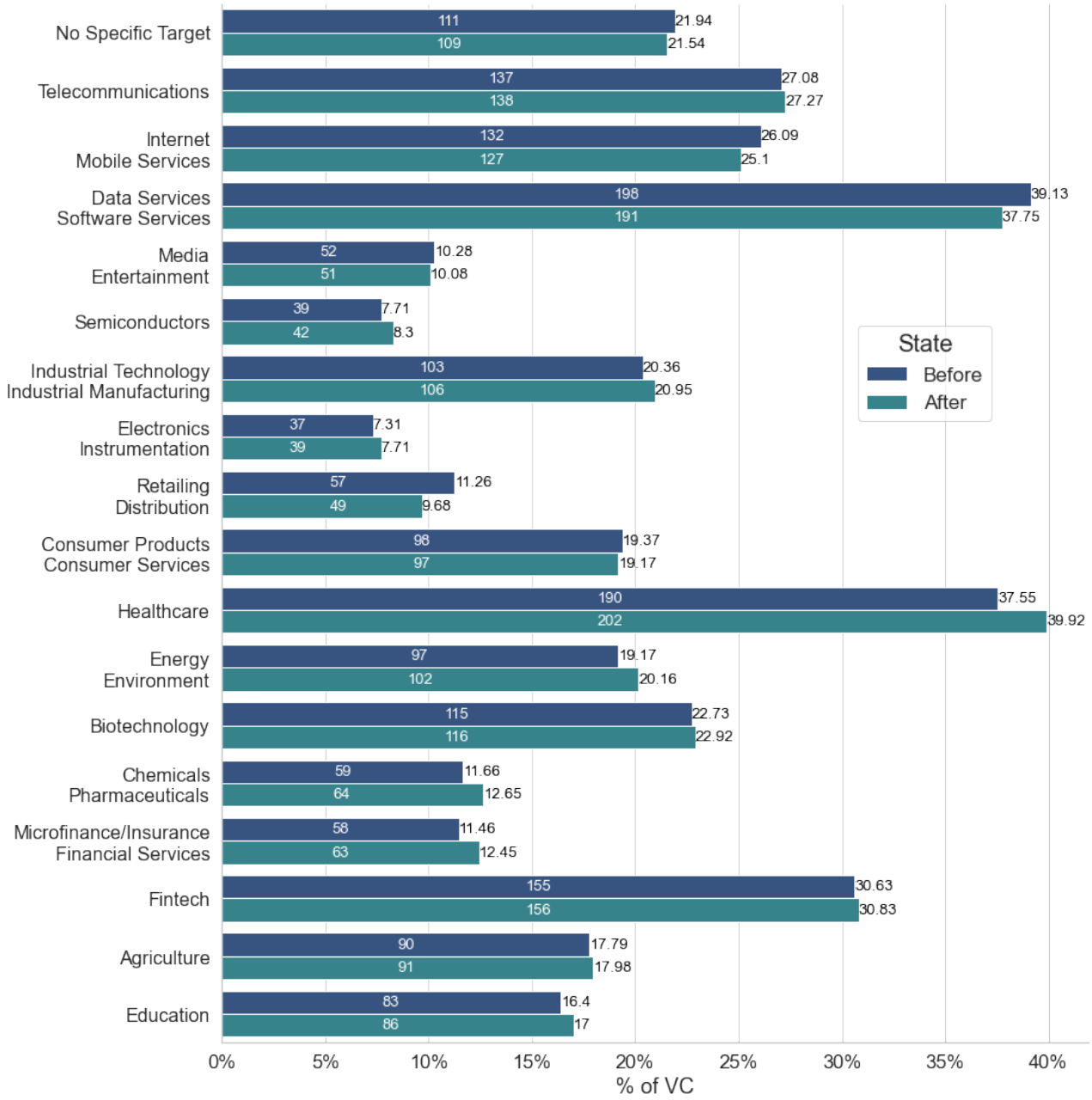
Targeted Venture Stages: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 17**. Left bar: before the COVID-19 outbreak; Right bar: after the COVID-19 outbreak.

Figure 16

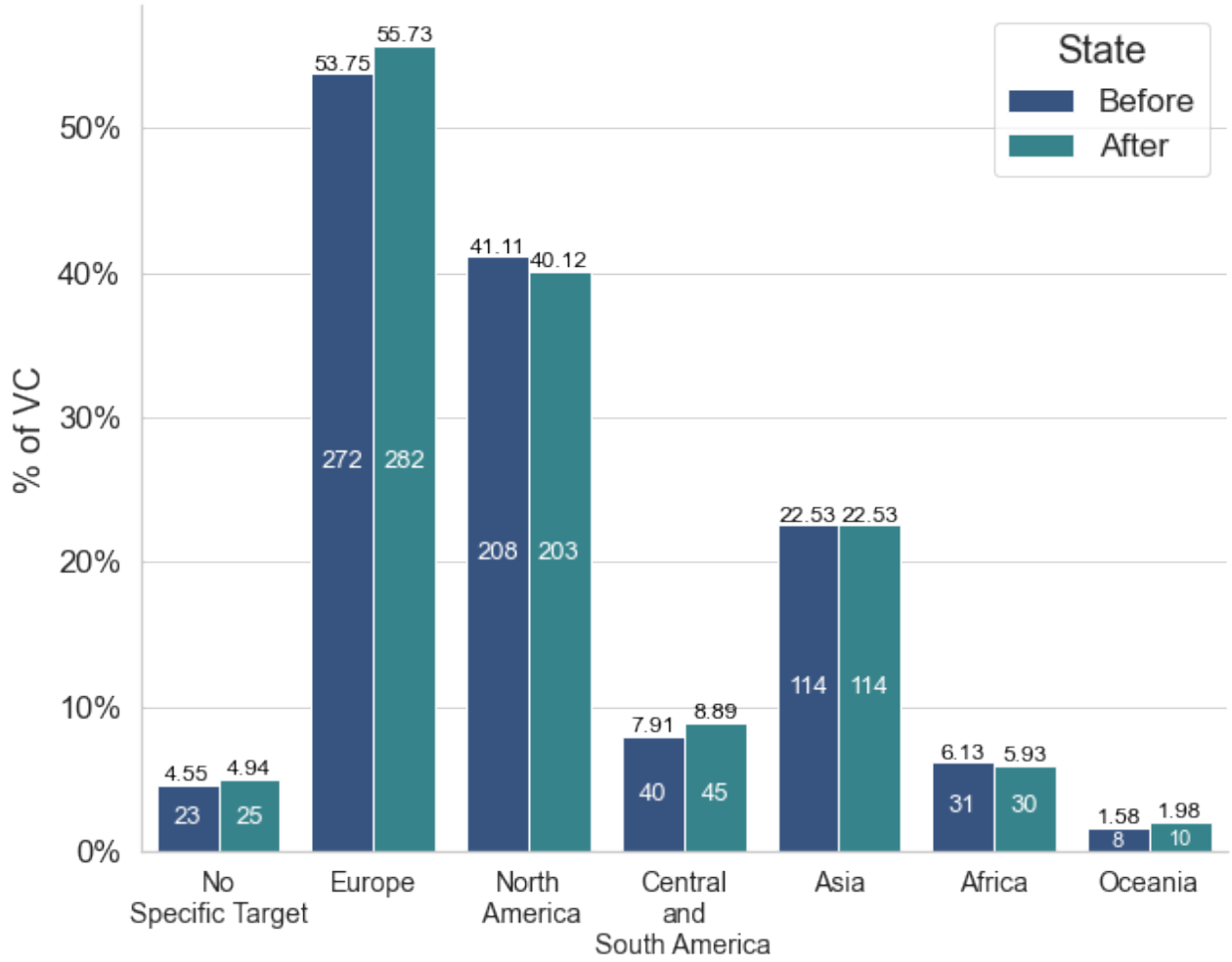
Targeted Industries: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 18**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 17

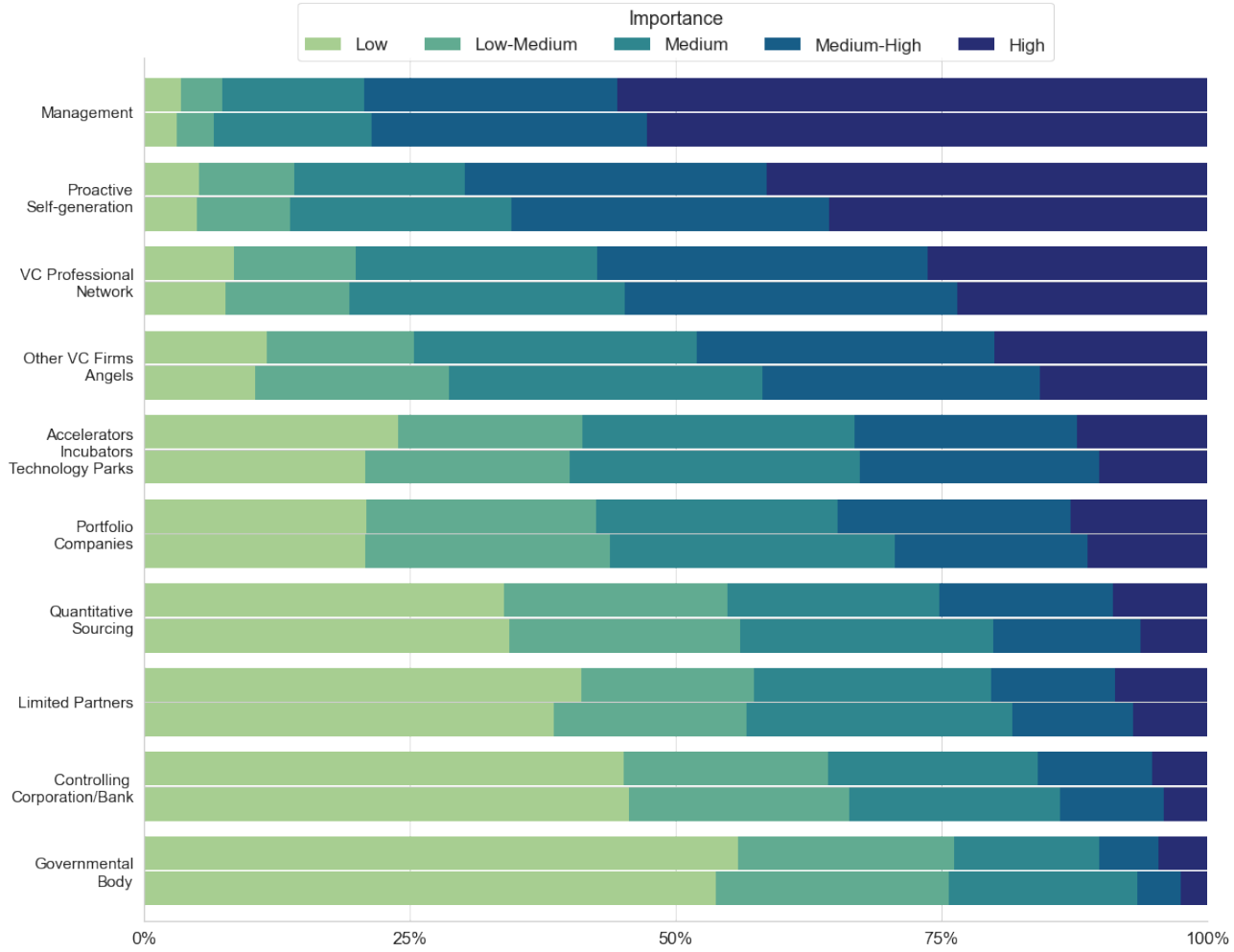
Targeted Geography: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 20**. Left bar: before the COVID-19 outbreak; Right bar: after the COVID-19 outbreak.

Figure 18

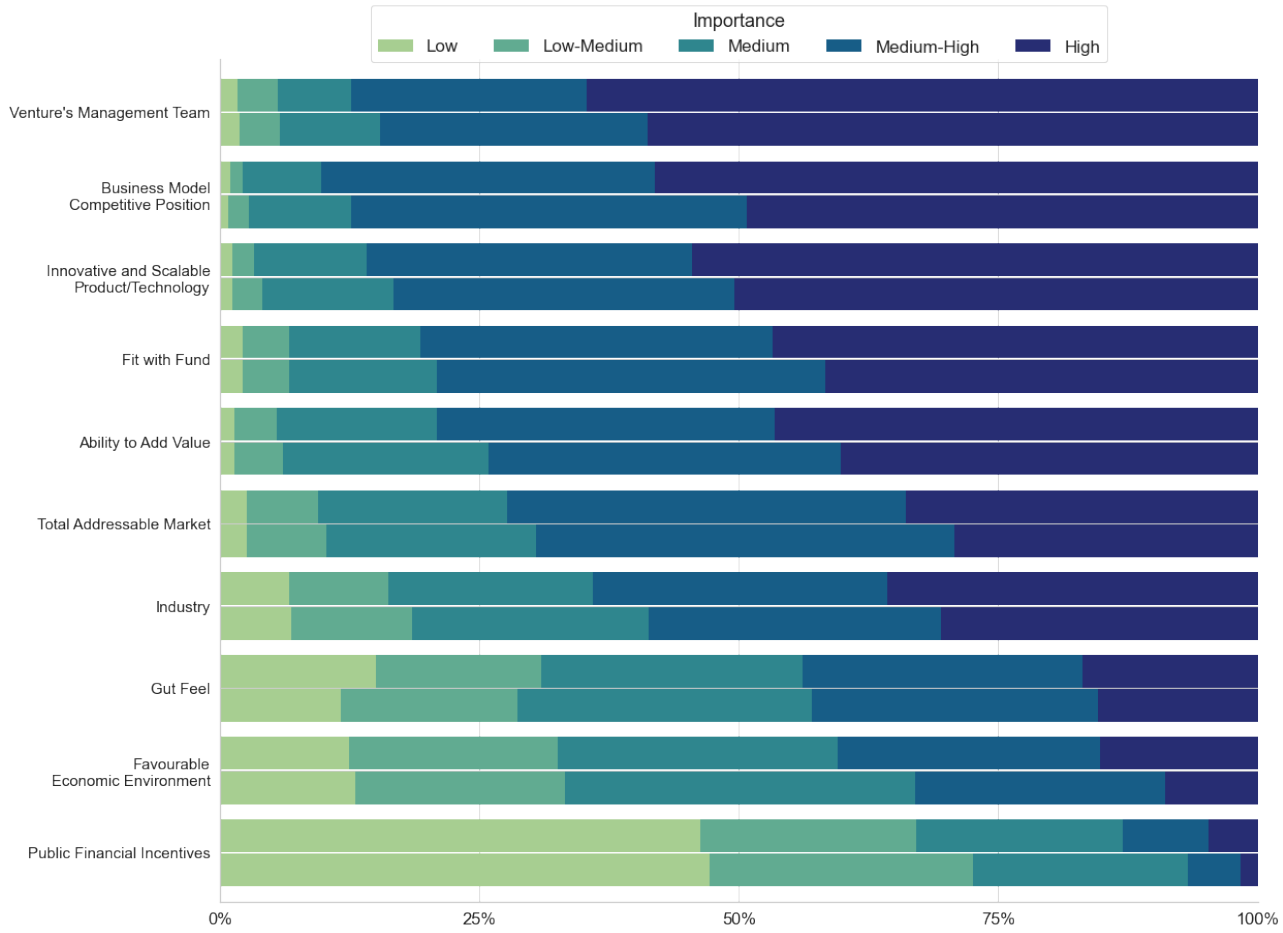
Importance of Deal Sources: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 23**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 19

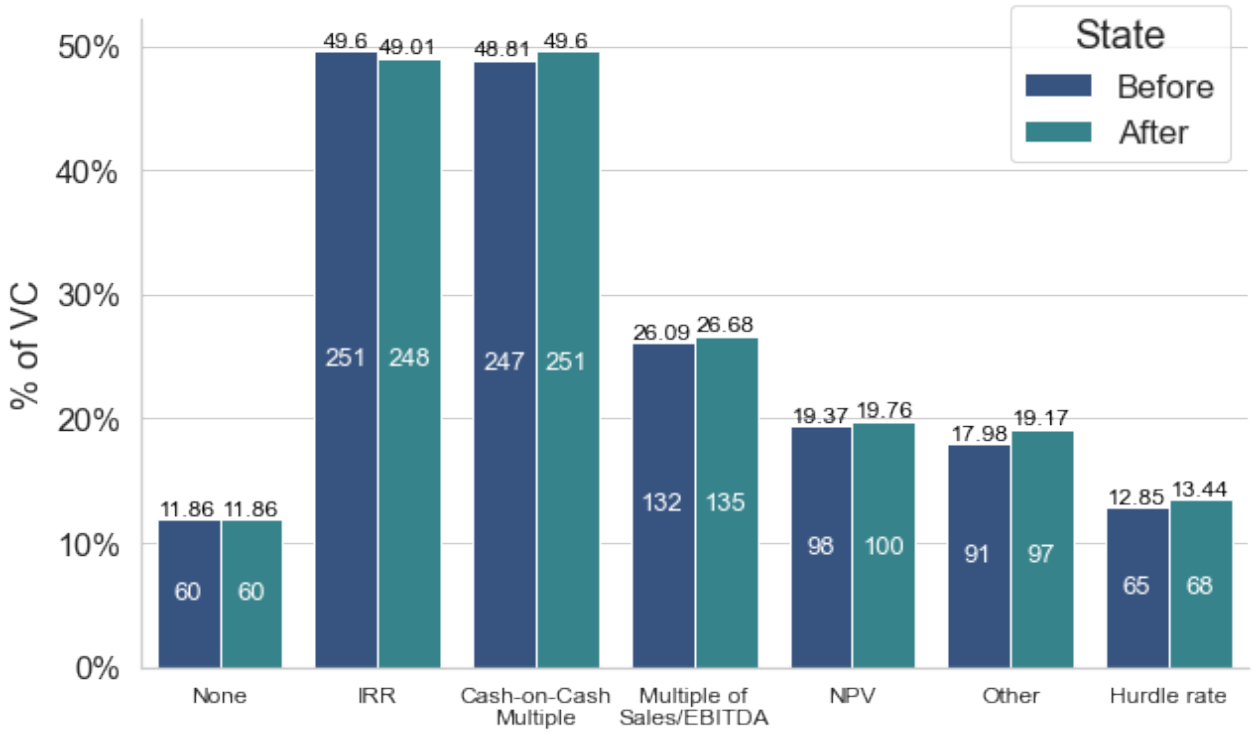
Importance of Factors Affecting Deal Selection: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 24**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 20

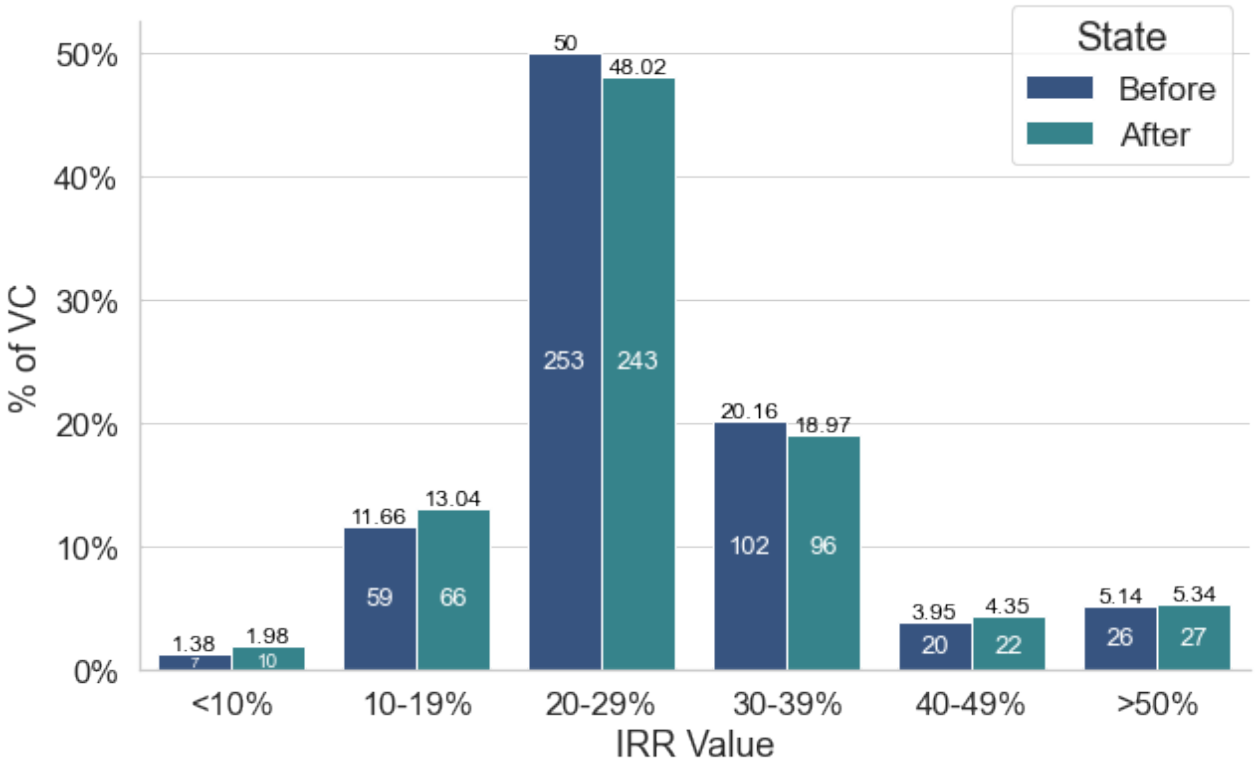
Financial Metrics used to Analyse Investments: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 27**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 21

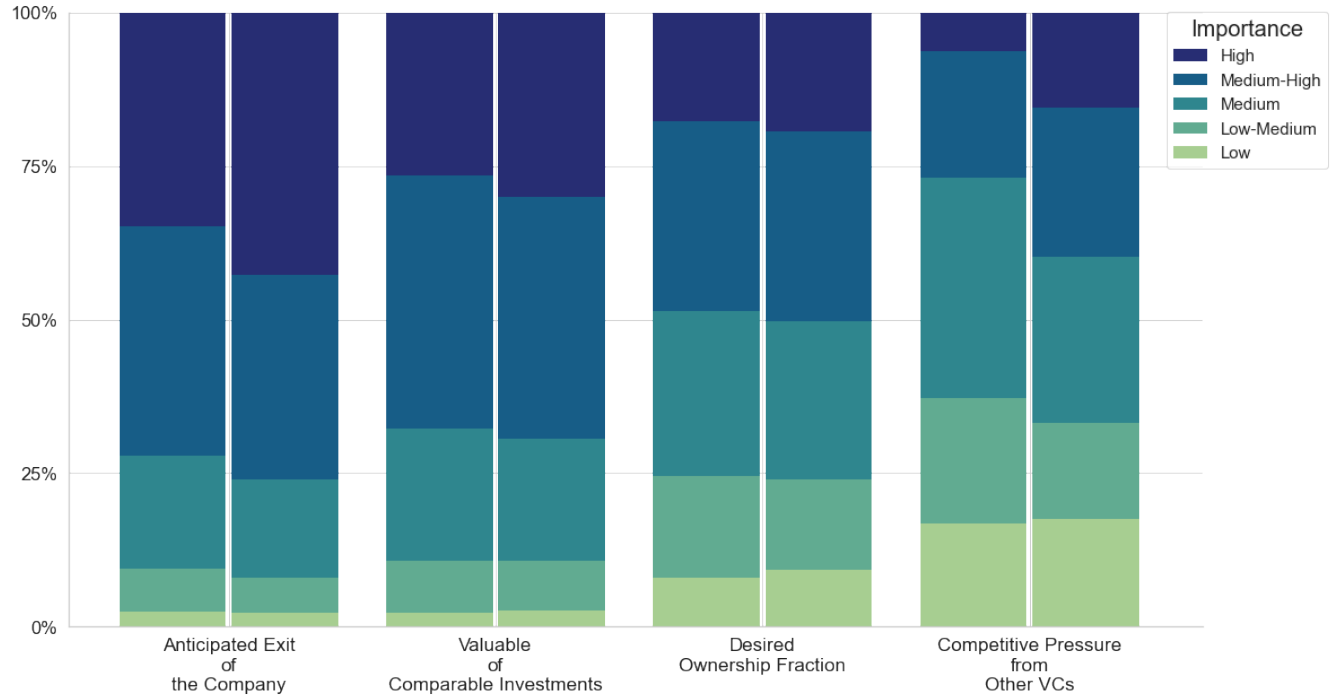
Target IRR of the Fund: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 28**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 22

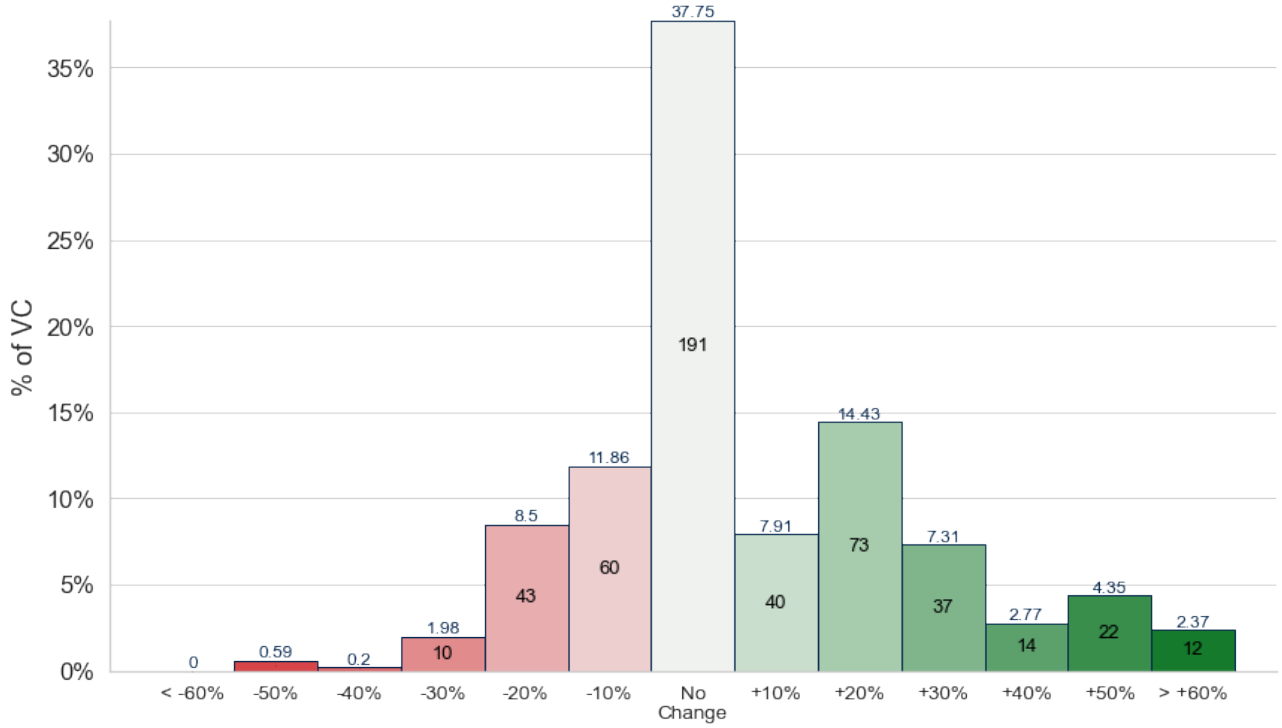
Importance of Factors Affecting Valuation: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 30**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 23

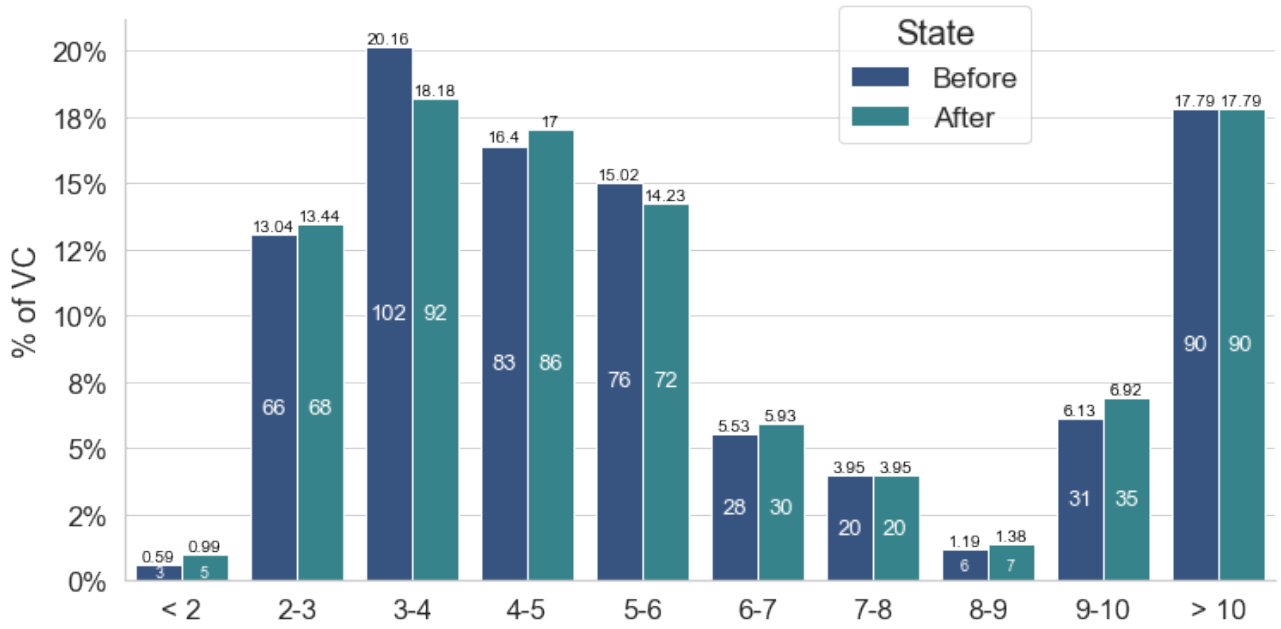
Impact on Investment Valuation



Note. The values shown refer to the "All" category shown in **Table 31**.

Figure 24

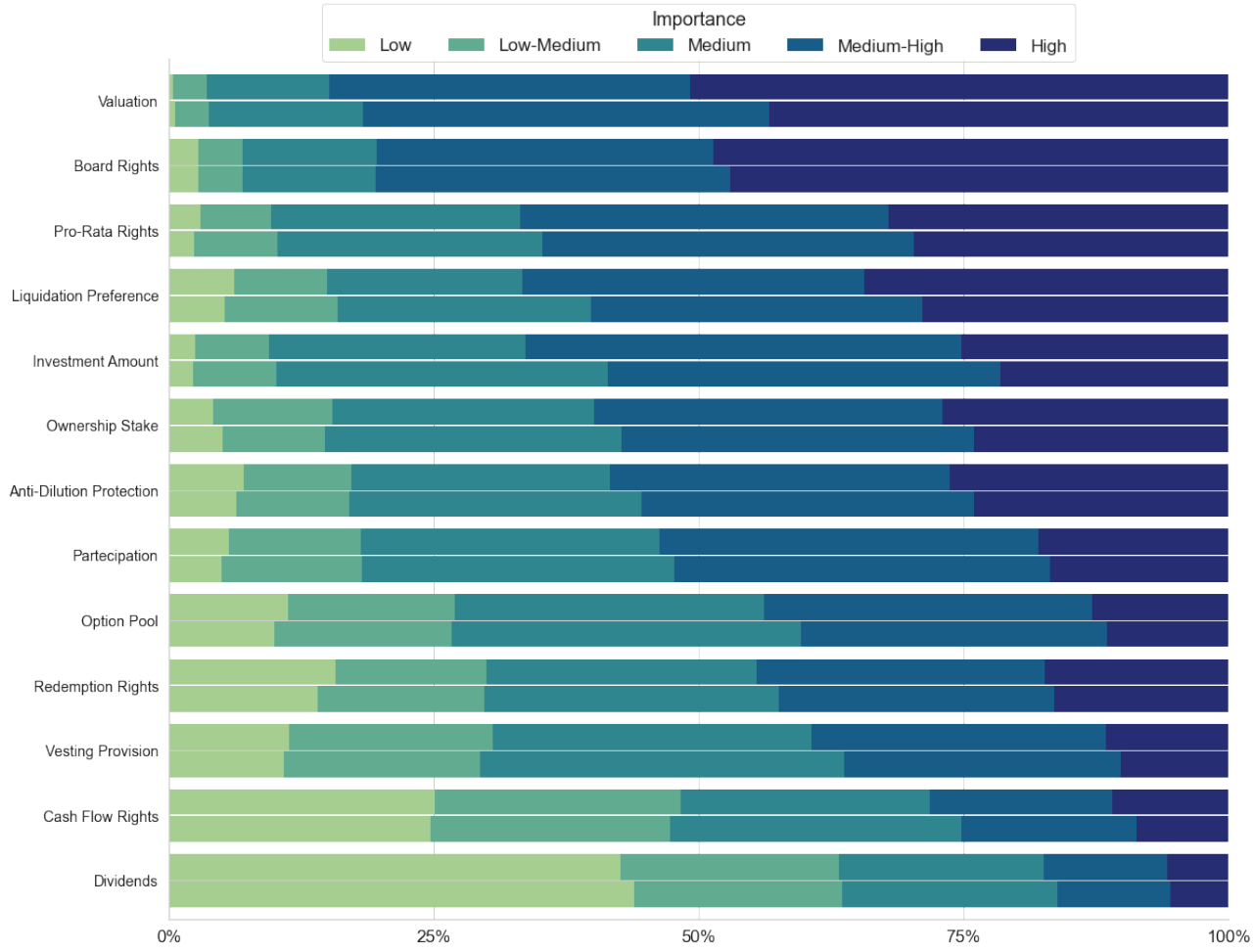
Target Multiple or Cash-on-Cash Multiple: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 34**. Left bar: before the COVID-19 outbreak; Right bar: after the COVID-19 outbreak.

Figure 25

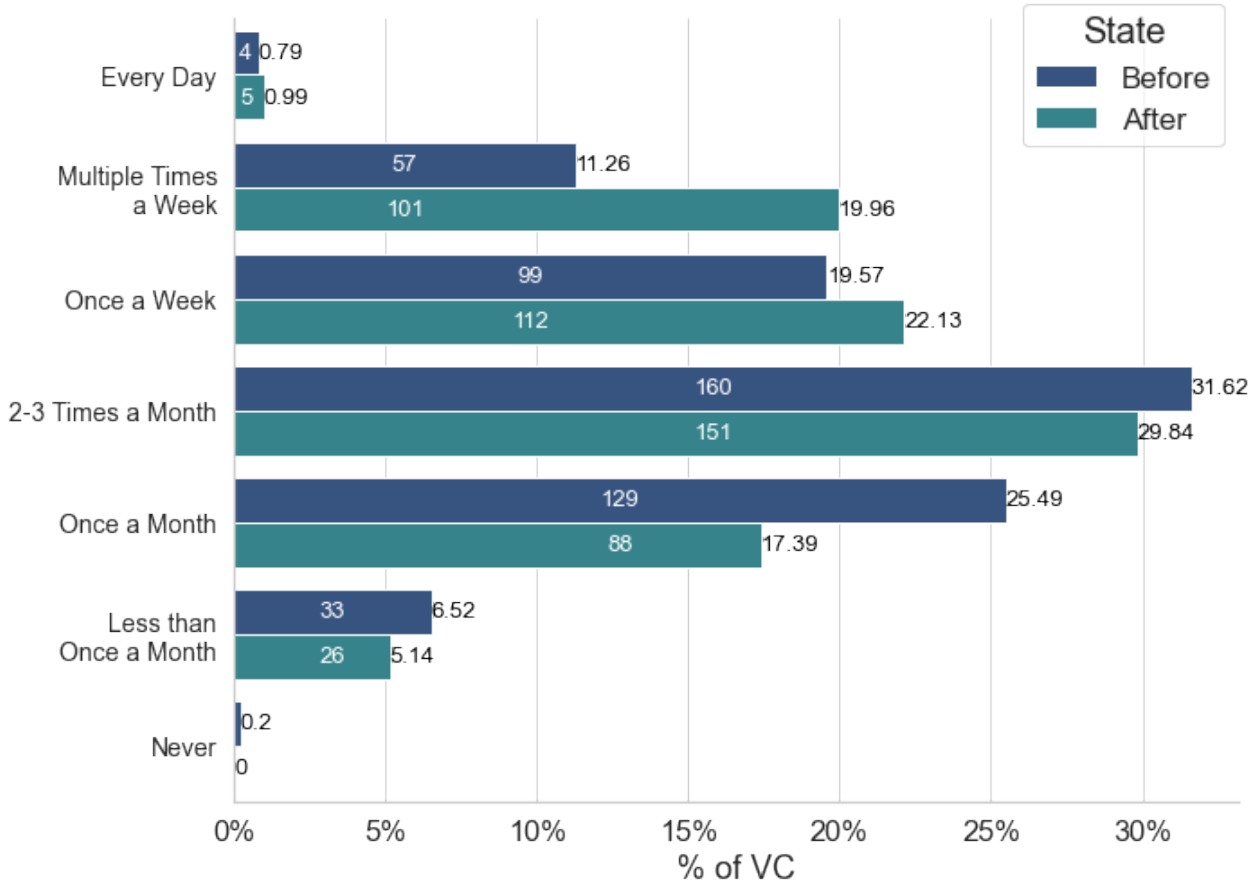
Relevance of Contractual Features: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table *37***. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 26

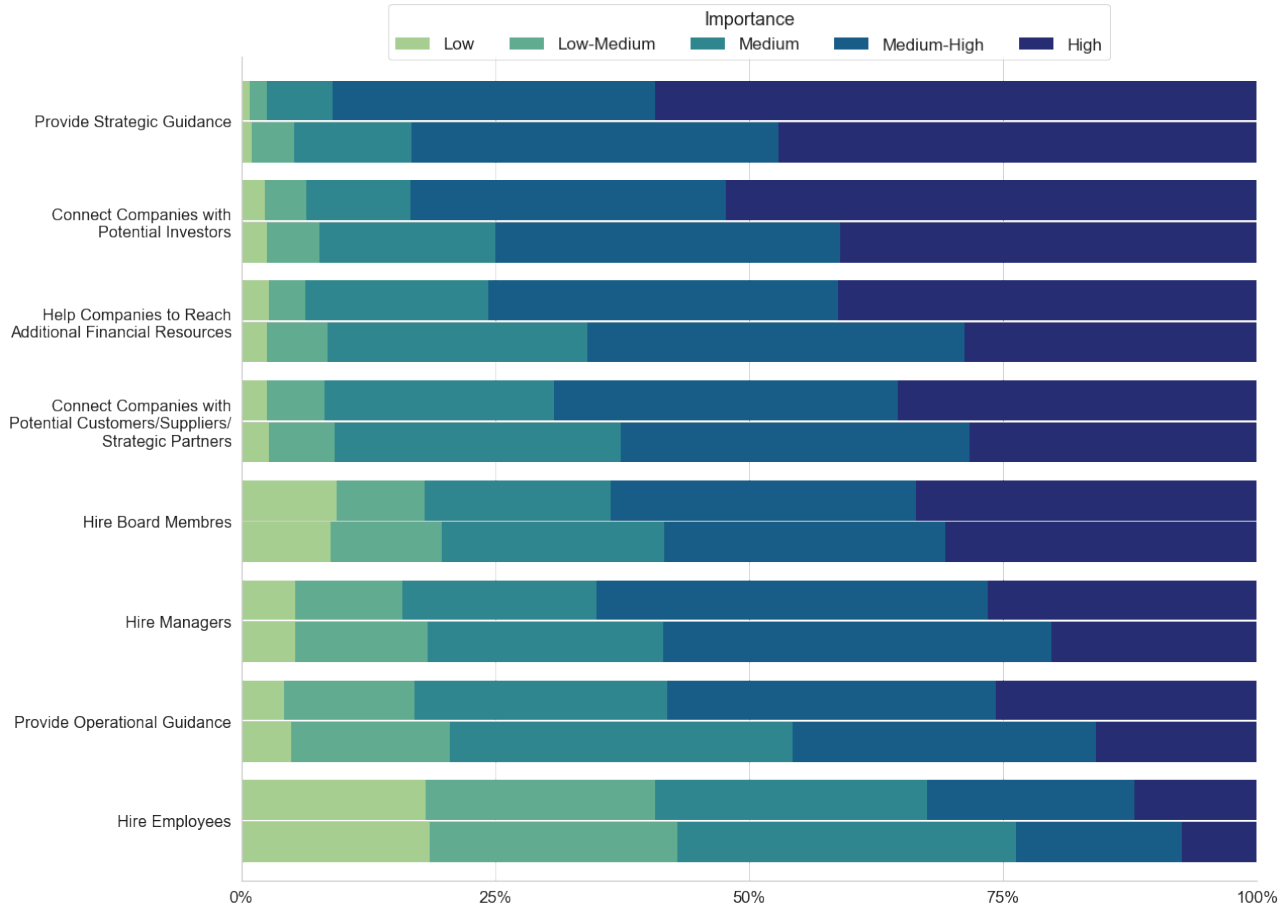
Frequency of Interaction with Portfolio Companies: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 41**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 27

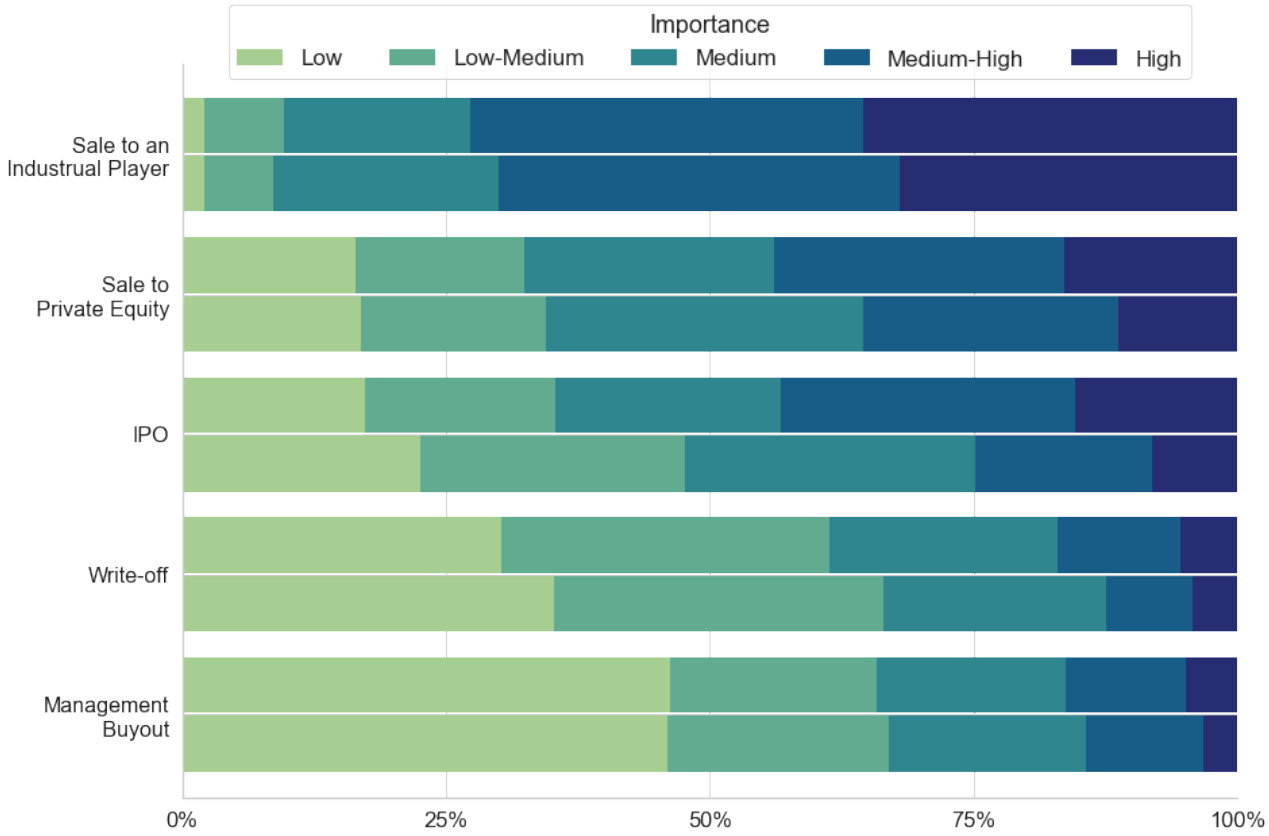
Frequency of Value-Added Activities: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 42**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 28

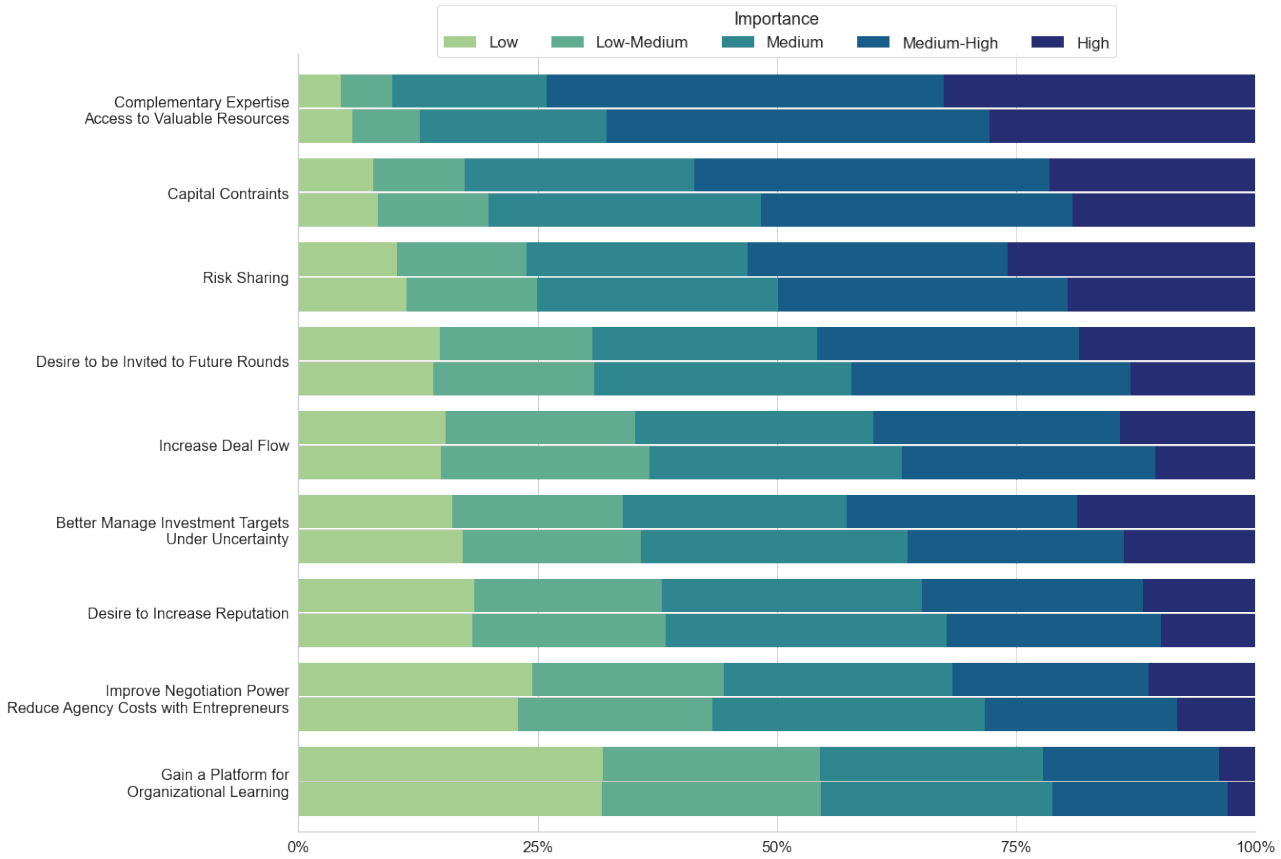
Frequency of Exit Type: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 43**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Figure 29

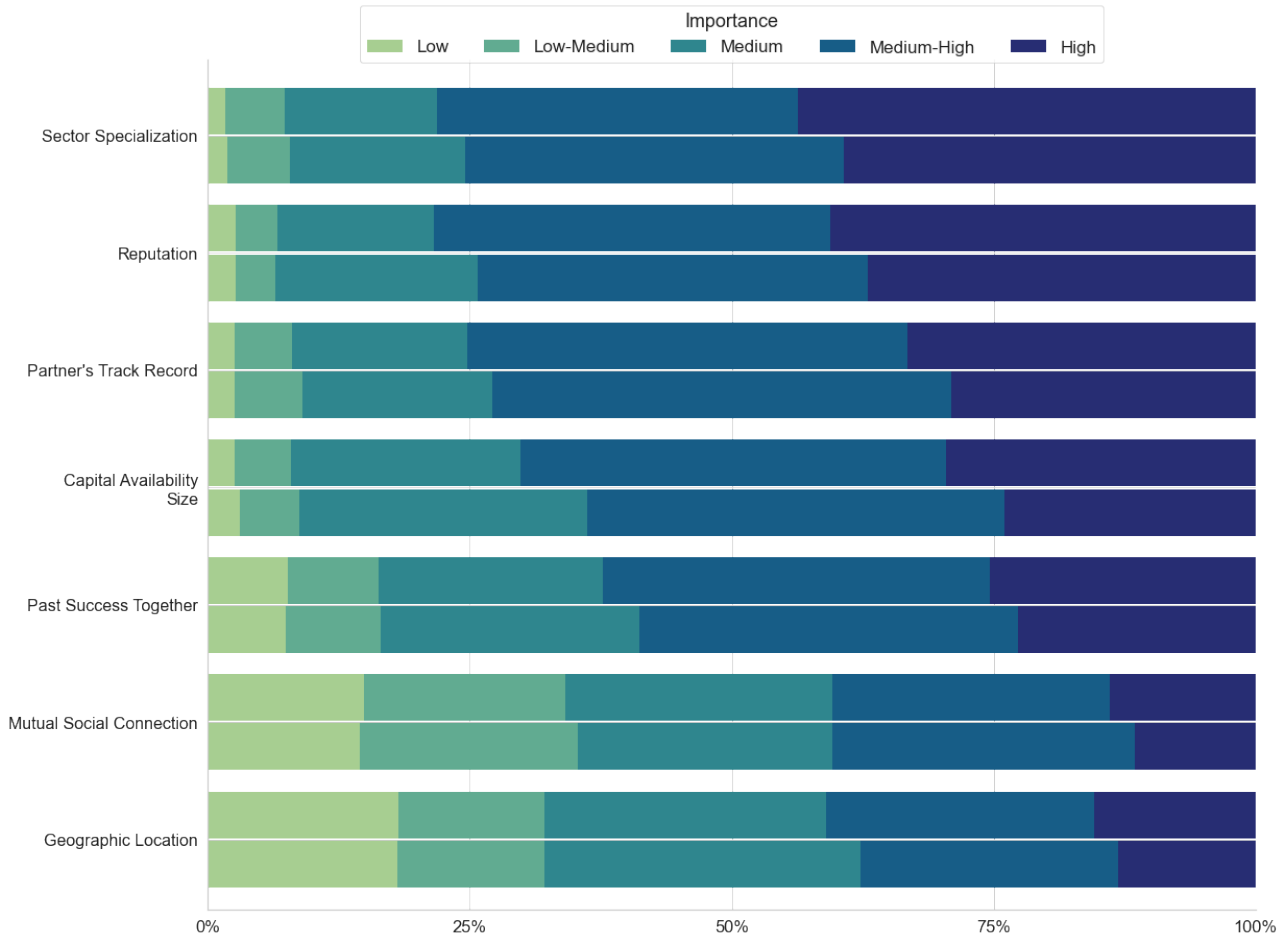
Relevance of Reasons to Syndicated a Deal: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 46**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

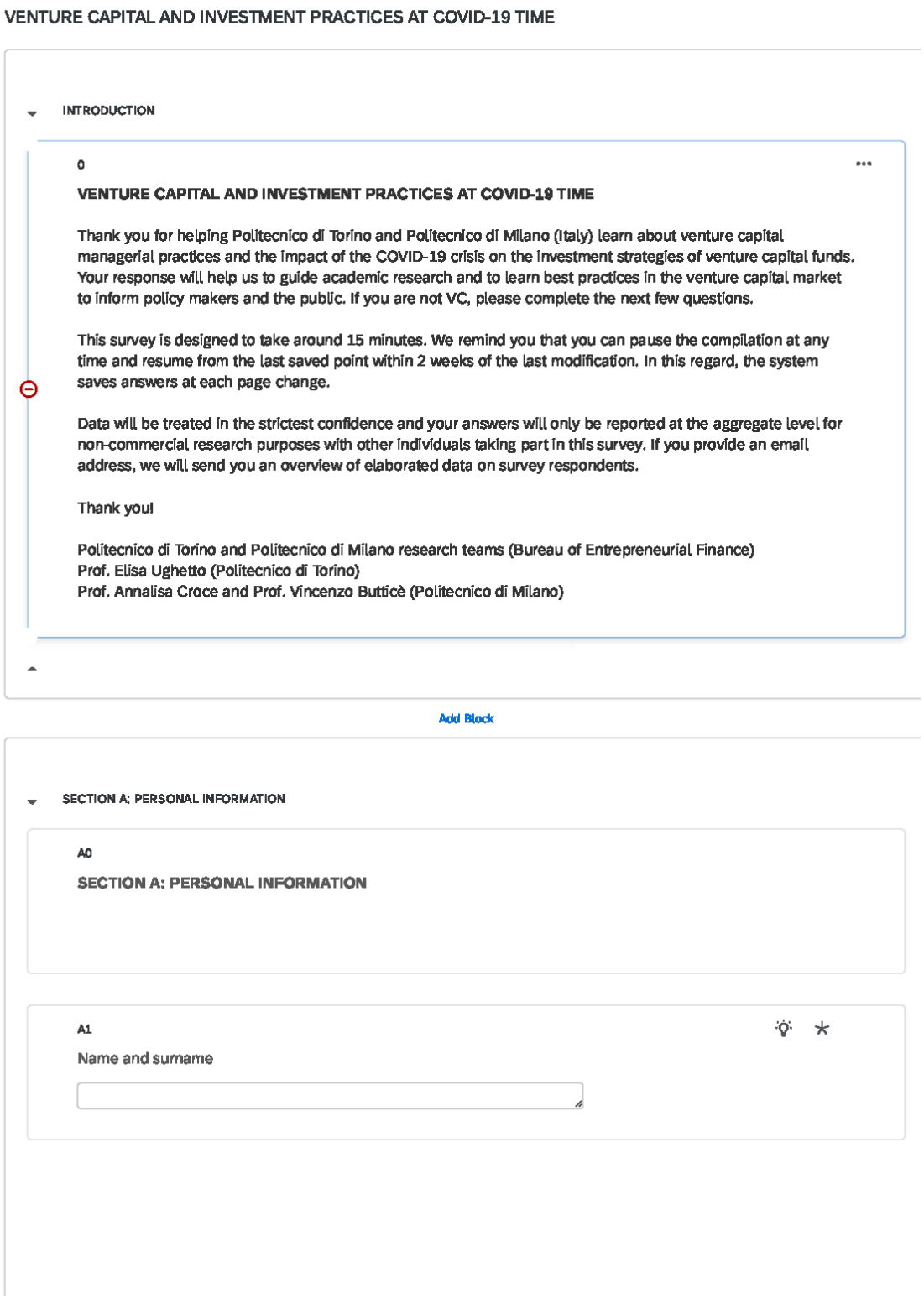
Figure 30

Relevance of Reasons to Choose a Syndicate Partner: Frequency of Answers



Note. The values shown refer to the "All" category shown in **Table 47**. Top bar: before the COVID-19 outbreak; Bottom bar: after the COVID-19 outbreak.

Appendix B: Survey



A2

Preferential e-mail address

A3

Year of birth *(optional)*

1935

A4

Gender *(optional)*

- ○ Male
- ○ Female
- ○ Prefer not to say
- ○ Other

A5

Nationality *(Optional)*

Afghan

A6

Where are you based?

Afghanistan

A7

Do you currently work on behalf of either an Institutional (Independent) venture capital fund or a Captive venture capital vehicle (es. Corporate venture capital, Bank-affiliated venture capital, Governmental venture capital)?

Select 1 answer only.

- ○ Yes, Institutional (Independent) venture capital
- ○ Yes, Captive venture capital vehicle (e.g. corporate VC, bank-affiliated VC, governmental VC)
- ○ No

A8

Display this question

If Do you currently work on behalf of either an Institutional (Independent) venture capital fund or... No Is Selected

Skip to

End of Survey if Fund of fund Is Selected

Skip to

End of Survey if Family office Is Selected

Skip to

End of Survey if I am an individual Angel In... Is Selected

Skip to

End of Survey if Other Is Selected

Skip to

End of Survey if Other Is Not Empty

Skip to

End of Survey if Private Equity fund Is Selected

Who do you invest on behalf of? Choose the one that applies the most.

- ○ Private Equity fund
- ○ Fund of fund
- ○ Family office
- ○ I am an individual Angel Investor
- ○ Other

Page Break

SECTION B: TYPE OF VENTURE CAPITAL, CHARACTERISTICS AND MODUS OPERANDI

B0

SECTION B: TYPE OF VENTURE CAPITAL, CHARACTERISTICS AND MODUS OPERANDI

The following set of questions ask about your current fund. If you are associated with multiple funds that make venture capital style investments, please provide your answers in reference to the fund you are most closely associated with. Please answer the following questions in reference to the context BEFORE COVID-19 outbreak.

B1

What is the name of the Venture Capital fund you work for?

B2 *

What is your job title?

Select 1 answer only.

- ○ Managing Partner
- ○ General Partner
- ○ Senior Partner
- ○ Partner / Venture Partner
- ○ Principal / Associate
- ○ Other

B3 *

How many people work, including you, in the managing team of the VC fund you work for (with roles: partners, associates, venture partners)?

B4 *

What is your fund's vintage year?

B5 *

What is the approximate total committed capital of your fund?

Please provide your answer in million of dollars (M$).

Page Break

B6 *

How many companies, approximately, do you have in your fund's portfolio?

B7 *

Can your fund be defined as a social impact venture capital fund (i.e. a fund that deliberately invests in businesses that are expected to generate economic, environmental and social value)?

Select 1 answer only.

- ○ Yes
- ○ No

B8 *

Does your fund have a

Select 1 answer only.

- ○ Cross-border investment focus
- ○ Domestic investment focus
- ○ Both

B9 *

Display this question

If Do you currently work on behalf of either an Institutional (Independent) venture capital fund or... Yes, Institutional (Independent) venture capital Is Selected

Who are the most relevant limited partners of your fund?

Select all that apply.

- ☐ Banks
- ☐ Corporate investors
- ☐ Governments and other public bodies
- ☐ Individuals
- ☐ Insurance companies
- ☐ Investment funds (FoF)
- ☐ Pension funds
- ☐ Other

Page Break

B10 *

Display this question

If Do you currently work on behalf of either an Institutional (Independent) venture capital fund or... Yes, Captive venture capital vehicle (e.g. corporate VC, bank-affiliated VC, governmental VC) Is Selected

Do you work on behalf of?

Select 1 answer only.

- ○ a Bank-controlled venture capital fund
- ○ a Governmental venture capital fund
- ○ a Corporate venture capital fund

B11 *

Display this question

If Do you work on behalf of? Select 1 answer only. a Corporate venture capital fund Is Selected

In what industries does your parent corporation operate?

Select all that apply.

- [ ] Telecommunications, IT Infrastructure and Cybersecurity
- [ ] Internet & Mobile services
- [ ] Data, Software & services
- [ ] Media and Entertainment
- [ ] Semiconductors
- [ ] Industrial Technology and Manufacturing
- [ ] Electronics/Instrumentation
- [ ] Retailing/distribution
- [ ] Consumer Products and Services
- [ ] Healthcare
- [ ] Energy and Environment
- [ ] Biotechnology
- [ ] Chemicals and Pharmaceuticals
- [ ] Microfinance/Insurance & Financial Services
- [ ] Fintech
- [ ] Agriculture
- [ ] Education
- [ ] Other

Page Break

SECTION C: INVESTMENT PRACTICES AND COVID CRISIS

C0

SECTION C – INVESTMENT PRACTICES AND COVID CRISIS

Please answer the following questions in reference to the context AFTER the COVID-19 outbreak.

VC INVESTMENT PROCESS

C1 *

After the COVID-19 outbreak, has your VC fund modified its investment strategies?

Select 1 answer only.

- ○ Not at all
- ○ Moderately
- ○ Significantly

C2 *

After the COVID-19 outbreak, has the overall time required to complete a deal changed?

Select 1 answer only.

- ○ Yes, it increased
- ○ Yes, it decreased
- ○ No, it did not change

C3 *

Is there any stage of the deal funnel that has been remarkably impacted **after** the COVID-19 outbreak (in terms of time/effort required/complexity, etc)? Please select, for each stage, if the overall effort required is increased / remained unchanged / decreased.

	Significantly decreased	Moderately decreased	No change	Moderately increased	Significantly increased
Deal sourcing / origination	○	○	○	○	○
Deal screening / selection	○	○	○	○	○
Due diligence (evaluation)	○	○	○	○	○
Deal structuring	○	○	○	○	○
Post-investment activity (monitoring, support, follow-ons)	○	○	○	○	○
Deal closing / exit	○	○	○	○	○

Page Break

C4 *

Display this question

If Does your fund have a Select 1 answer only. Cross-border investment focus Is Selected

Or Does your fund have a Select 1 answer only. Both Is Selected

After the COVID-19 outbreak, has your VC fund reduced cross-border venture capital investment in favour of a more domestic focus?

Select 1 answer only.

- ○ Yes
- ○ No
- ○ Not applicable

C5 *

Before COVID-19 outbreak, what stage of company did you use to target?

Select all that apply.

- [ ] All stages
- [ ] Seed Stage
- [ ] Early Stage
- [ ] Mid Stage
- [ ] Late Stage / Growth Equity

C6 *

After COVID-19 outbreak, what stage do you currently target?

Select all that apply.

- [ ] All stages
- [ ] Seed Stage
- [ ] Early Stage
- [ ] Mid Stage
- [ ] Late Stage / Growth Equity

C7 *

Before COVID-19 outbreak, what industries did you use to target?

Select all that apply.

- [ ] I did not use to target a particular industry
- [ ] Telecommunications, IT Infrastructure and Cybersecurity
- [ ] Internet & Mobile services
- [ ] Data, Software & services
- [ ] Media and Entertainment
- [ ] Semiconductors
- [ ] Industrial Technology and Manufacturing
- [ ] Electronics/instrumentation
- [ ] Retailing/distribution
- [ ] Consumer Products and Services
- [ ] Healthcare
- [ ] Energy and Environment
- [ ] Biotechnology
- [ ] Chemicals and Pharmaceuticals
- [ ] Microfinance/Insurance & Financial Services
- [ ] Fintech
- [ ] Agriculture
- [ ] Education
- [ ] Other

C8 *

After COVID-19 outbreak, what industries do you currently target?

Select all that apply.

- [ ] I don't target a particular industry
- [ ] Telecommunications, IT Infrastructure and Cybersecurity
- [ ] Internet & Mobile services
- [ ] Data, Software & services
- [ ] Media and Entertainment
- [ ] Semiconductors
- [ ] Industrial Technology and Manufacturing
- [ ] Electronics/instrumentation
- [ ] Retailing/distribution
- [ ] Consumer Products and Services
- [ ] Healthcare
- [ ] Energy and Environment
- [ ] Biotechnology
- [ ] Chemicals and Pharmaceuticals
- [ ] Microfinance/Insurance & Financial Services
- [ ] Fintech
- [ ] Agriculture
- [ ] Education
- [ ] Other

Page Break

C9 *

Before COVID-19 outbreak, what geographies did you use to target?

Select all that apply.

- [ ] I did not use to target a particular area
- [ ] Europe
- [ ] North America
- [ ] Central and South America
- [ ] Asia
- [ ] Africa
- [ ] Oceania

C10 *

After COVID-19 outbreak, what geographies do you currently target?

Select all that apply.

- [ ] I don't target a particular area
- [ ] Europe
- [ ] North America
- [ ] Central and South America
- [ ] Asia
- [ ] Africa
- [ ] Oceania

Page Break

C11.0

DEAL ORIGINATION AND SELECTION

C11

Here are presented the main sources through which deals are usually generated. Please assign a value from 1 to 5 (0 = not applicable) to each of the following factors according to their relevance for you in the **pre** COVID-19 scenario and in the **post** COVID-19 scenario.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	0	1	2	3	4	5	0	1	2	3	4	5
Management	○	○	○	○	○	○	○	○	○	○	○	○
Limited Partners	○	○	○	○	○	○	○	○	○	○	○	○
Other VC firms or angels	○	○	○	○	○	○	○	○	○	○	○	○
Accelerators / Incubators / Technology Parks	○	○	○	○	○	○	○	○	○	○	○	○
Portfolio companies	○	○	○	○	○	○	○	○	○	○	○	○
Proactive self-generation	○	○	○	○	○	○	○	○	○	○	○	○
Quantitative sourcing	○	○	○	○	○	○	○	○	○	○	○	○
VC professional network	○	○	○	○	○	○	○	○	○	○	○	○
Controlling corporation or bank	○	○	○	○	○	○	○	○	○	○	○	○
Governmental body	○	○	○	○	○	○	○	○	○	○	○	○

Page Break

C12

Please assign a value from 1 to 5 (0 = not applicable) to each of the following factors according to their relevance in deciding whether to invest, in the **pre** COVID-19 scenario and in the **post** COVID-19 scenario.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	1	2		4	5		1	2		4	5	
Ability of your fund to add value	○	○	○	○	○	○	○	○	○	○	○	○
Business model / competitive position	○	○	○	○	○	○	○	○	○	○	○	○
Gut feel (e.g. personal instinct)	○	○	○	○	○	○	○	○	○	○	○	○
Fit with fund	○	○	○	○	○	○	○	○	○	○	○	○
Industry	○	○	○	○	○	○	○	○	○	○	○	○
Favourable economic environment	○	○	○	○	○	○	○	○	○	○	○	○
Total addressable market	○	○	○	○	○	○	○	○	○	○	○	○
Innovative and scalable product / technology	○	○	○	○	○	○	○	○	○	○	○	○
Public financial incentives	○	○	○	○	○	○	○	○	○	○	○	○
Venture's management team	○	○	○	○	○	○	○	○	○	○	○	○

C13

Compared to the pre COVID-19 period, which is now the likelihood that you will make a "gut decision" (based on intuition and gut feelings) to invest when meeting a company's management team for the first time?

Select one answer only.

- ○ More likely
- ○ Less likely
- ○ Not changed

Page Break

C14.0

VALUATION

C14

Which financial metrics, if any, did you use to analyze investments in the **pre** COVID-19 scenario? And which ones have you been using in the **post** COVID-19 scenario?

Select all that apply.

	Financial metrics						
	None	Multiple of sales / EBITDA	Cash-on-cash multiple	Hurdle rate	IRR	NPV	Other
Pre COVID-19 outbreak	☐	☐	☐	☐	☐	☐	☐
Post COVID-19 outbreak	☐	☐	☐	☐	☐	☐	☐

C15 *

Before COVID-19 outbreak, what was, usually, your target IRR for your fund?

Select one answer only.

- ○ <10%
- ○ 10-19%
- ○ 20-29%
- ○ 30-39%
- ○ 40-49%
- ○ >50%
- ○ Not available

C16 *

Display this question

If Can your fund be defined as a social impact venture capital fund (i.e. a fund that deliberately i... Yes Is Selected

Before COVID-19 outbreak, did you target:

Select one answer only.

- ○ risk-adjusted, market rates of return
- ○ below-market-rate returns
- ○ below-market-rate returns that are closer to market-rate
- ○ returns that are closer to capital preservation

C17 *

After COVID-19 outbreak, did you change your target IRR for your fund? What is your current target IRR for your fund?

Select one answer only.

- ○ <10%
- ○ 10-19%
- ○ 20-29%
- ○ 30-39%
- ○ 40-49%
- ○ >50%
- ○ Not available

Page Break

C18

The following table lists the main factors evaluated when deciding what valuation to offer a company. Please assign a value from 1 to 5 (0 = not applicable) to each factor for both the **pre** Covid-19 scenario and the **post** Covid-19 scenario.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre Covid-19 outbreak						Post Covid-19 outbreak					
	0	1	2	3	4	5	0	1	2	3	4	5
Competitive pressure from other VCs	○	○	○	○	○	○	○	○	○	○	○	○
Anticipated exit of the company	○	○	○	○	○	○	○	○	○	○	○	○
Valuation of comparable investments	○	○	○	○	○	○	○	○	○	○	○	○
Desired ownership fraction	○	○	○	○	○	○	○	○	○	○	○	○

C19

How did COVID-19 impact your valuations of investments?

Select one answer only.

- ○ > + 60%
- ○ + 50%
- ○ + 40%
- ○ + 30%
- ○ + 20%
- ○ + 10%
- ○ 0%
- ○ - 10%
- ○ - 20%
- ○ - 30%
- ○ - 40%
- ○ - 50%
- ○ < - 60%

C20

After COVID-19 outbreak, what kind of adjustments, if any, are made for valuations?

Select all that apply.

- ☐ Adjustments in cash flow projections
- ☐ Adjustments in the allocation of a higher cost of capital
- ☐ Adjustments related to the difficulty in finding financial resources
- ☐ No adjustments
- ☐ Other

C21 *

After COVID-19 outbreak, for which kind of companies have you been making more relevant adjustments in valuations?

Select one answer only.

- ○ Embryonic companies (i.e. companies at a very early stage in their development that experience significant growth that exceeds the growth rate in the economy)
- ○ More mature companies (i.e. companies well established in their industry that grow at the rate of the economy at large)
- ○ Both
- ○ None

C22 | What is your usual target gross multiple or cash-on-cash multiplefor an investment? Please provide *

What is your usual target gross multiple or cash-on-cash multiple for an investment? Please provide one answer only for both **pre** COVID-19 scenario and **post** COVID-19 scenario.

	Multiple									
	< 2x	2-3 x	3-4 x	4-5 x	5-6x	6-7 x	7-8 x	8-9 x	9-10 x	> 10 x
Pre Covid-19 outbreak	○	○	○	○	○	○	○	○	○	○
Post Covid-19 outbreak	○	○	○	○	○	○	○	○	○	○

Page Break

C23.0

DEAL STRUCTURING

C23 *

The following factors characterize the deal structuring. Which of these items were mostly affected by the COVID-19 outbreak (in terms of time/effort required/complexity, etc)?

Select all that apply.

- ☐ Not affected
- ☐ Review with partners and investment committee
- ☐ Due diligence
- ☐ Preparation of term sheets and negotiation of contractual terms
- ☐ Other

C24

In the following table are listed the main contractual features for investments. Please assign a value from 1 to 5 (0 = not applicable) to each contractual feature according to its relevance for your investments in the **pre** COVID-19 scenario and in the **post** COVID-19 scenario.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	0	1	2	3	4	5	0	1	2	3	4	5
Antidilution protection	○	○	○	○	○	○	○	○	○	○	○	○
Board rights	○	○	○	○	○	○	○	○	○	○	○	○
Dividends	○	○	○	○	○	○	○	○	○	○	○	○
Investment amount	○	○	○	○	○	○	○	○	○	○	○	○
Liquidation preference	○	○	○	○	○	○	○	○	○	○	○	○
Option pool	○	○	○	○	○	○	○	○	○	○	○	○
Ownership stake	○	○	○	○	○	○	○	○	○	○	○	○
Participation	○	○	○	○	○	○	○	○	○	○	○	○
Pro rata rights	○	○	○	○	○	○	○	○	○	○	○	○
Redemption rights	○	○	○	○	○	○	○	○	○	○	○	○
Valuation	○	○	○	○	○	○	○	○	○	○	○	○
Vesting provision	○	○	○	○	○	○	○	○	○	○	○	○
(Residual) Cash flow rights	○	○	○	○	○	○	○	○	○	○	○	○

C25

Do you think COVID-19 impact on venture capital has shifted negotiation towards either venture capitalists or entrepreneurs?

Select one answer only.

- ○ Yes, venture capitalists gained negotiation power over entrepreneurs
- ○ Yes, entrepreneurs gained negotiation power over venture capitalists
- ○ No shifts in negotiation power

Page Break

C26.0

POST INVESTMENT AND EXIT

C26

On average, how frequently do you actively interact with the management of your portfolio's companies? Please provide your answers by selecting one answer only for both scenarios, **pre** COVID-19 outbreak and **post** COVID-19 outbreak.

	Frequency						
	Never	Less than once a month	Once a month	2-3 times a month	Once a week	Multiple times a week	Every day
Pre COVID-19 outbreak	○	○	○	○	○	○	○
Post COVID-19 outbreak	○	○	○	○	○	○	○

C27

In the following table are listed some of the most relevant value-added activities for portfolio's companies. Please assign a value from 1 to 5 (0 = not applicable) to each activity according to how frequently you undertake them for the companies in your portfolio for both scenarios, **pre** COVID-19 outbreak and **post** COVID-19 outbreak.

(0 = not applicable, 1 = never, ..., 5 = very frequent)

	Pre COVID-19 outbreak					Post COVID-19 outbreak				
	1	2		4	5	1	2		4	5
Provide help to companies in hiring employees	○	○	○	○	○	○	○	○	○	○	○	○
Provide help to companies in hiring managers	○	○	○	○	○	○	○	○	○	○	○	○
Provide help to companies in hiring board members	○	○	○	○	○	○	○	○	○	○	○	○
Provide operational guidance	○	○	○	○	○	○	○	○	○	○	○	○
Provide strategic guidance	○	○	○	○	○	○	○	○	○	○	○	○
Connect companies with potential customers, suppliers, or strategic partners	○	○	○	○	○	○	○	○	○	○	○	○
Connect companies with potential investors	○	○	○	○	○	○	○	○	○	○	○	○
Help companies to reach additional financial resources	○	○	○	○	○	○	○	○	○	○	○	○

Page Break

C28

In the following table are listed some types of exit. Please assign a value from 1 to 5 (0 = not applicable) to each activity according to the frequency with which you experienced them for both the **pre** COVID-19 scenario and **post** COVID -19 scenario.

(0 = not applicable, 1 = never, ..., 5 = very frequent)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	1	2		4	5		1	2		4	5	
IPO	○	○	○	○	○	○	○	○	○	○	○	○
Sale to an industrial player	○	○	○	○	○	○	○	○	○	○	○	○
Sale to private equity	○	○	○	○	○	○	○	○	○	○	○	○
Management buyout	○	○	○	○	○	○	○	○	○	○	○	○
Write off	○	○	○	○	○	○	○	○	○	○	○	○

C29

Has COVID-19 impacted your exit decisions in terms of time? Have you decided to postpone some exits that were pre-scheduled?

Select one answer only.

○ Yes

○ No

Page Break

C30.0

SYNDICATION

C30

Approximately, what percentage of your investments are syndicated? Please provide your answers for both scenarios, **pre** COVID-19 outbreak and **post** COVID-19 outbreak.

% of syndicated investments pre COVID-19 outbreak

% of syndicated investments post COVID-19 outbreak

C31

In the following table are listed the most important factors based on which you usually choose to syndicate a round. Please assign a value from 1 to 5 (0 = not applicable) to each of the following factors according to the importance they have for your decisions for both scenarios, **pre** COVID-19 outbreak and **post** COVID-19 outbreak.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	0	1	2	3	4	5	0	1	2	3	4	5
Capital constraints	○	○	○	○	○	○	○	○	○	○	○	○
Complementary expertise/access to valuable resources	○	○	○	○	○	○	○	○	○	○	○	○
Desire to be invited to future rounds (more opportunities)	○	○	○	○	○	○	○	○	○	○	○	○
Desire to increase reputation	○	○	○	○	○	○	○	○	○	○	○	○
Gain a platform for organizational learning	○	○	○	○	○	○	○	○	○	○	○	○
Risk sharing	○	○	○	○	○	○	○	○	○	○	○	○
Increase deal flow	○	○	○	○	○	○	○	○	○	○	○	○
Improve negotiation power and reduce agency costs with entrepreneurs	○	○	○	○	○	○	○	○	○	○	○	○
Better manage investment targets where uncertainty dominates	○	○	○	○	○	○	○	○	○	○	○	○

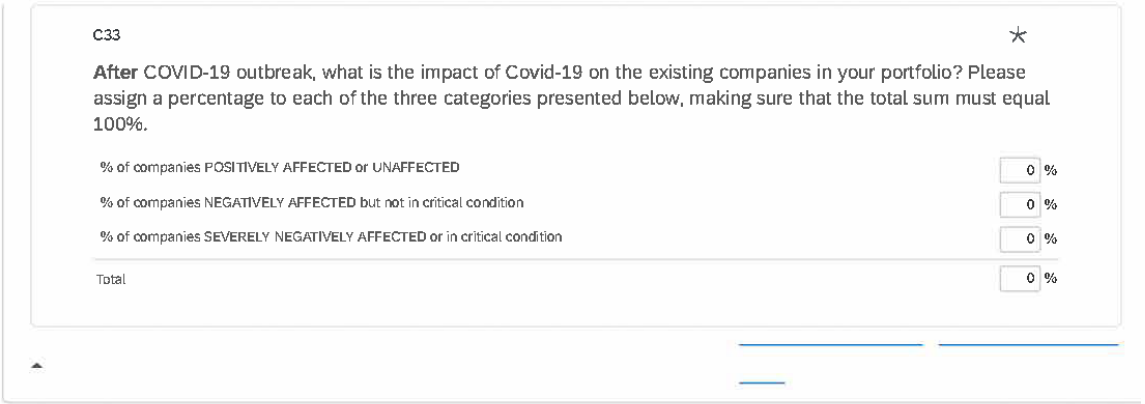
Page Break

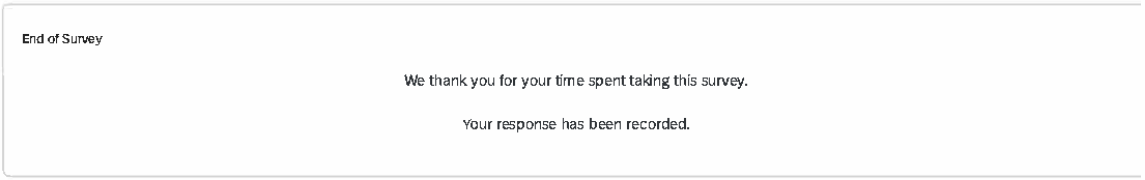
C32

In the following table are listed the most important factors based on which you usually choose a syndicate partner or coinvestor. Please assign a value from 1 to 5 (0 = not applicable) to each of the following factors according to the importance they have for your decisions for both scenarios, **pre** COVID-19 outbreak and **post** COVID-19 outbreak.

(0 = not applicable, 1 = low importance, ..., 5 = high importance)

	Pre COVID-19 outbreak						Post COVID-19 outbreak					
	0	1	2	3	4	5	0	1	2	3	4	5
Capital availability / size	○	○	○	○	○	○	○	○	○	○	○	○
Geographic location	○	○	○	○	○	○	○	○	○	○	○	○
Industry sector expertise	○	○	○	○	○	○	○	○	○	○	○	○
Mutual social connection	○	○	○	○	○	○	○	○	○	○	○	○
Past successes together	○	○	○	○	○	○	○	○	○	○	○	○
Reputation	○	○	○	○	○	○	○	○	○	○	○	○
Track record of partner	○	○	○	○	○	○	○	○	○	○	○	○


C33
After COVID-19 outbreak, what is the impact of Covid-19 on the existing companies in your portfolio? Please assign a percentage to each of the three categories presented below, making sure that the total sum must equal 100%.
% of companies POSITIVELY AFFECTED or UNAFFECTED
0 %
% of companies NEGATIVELY AFFECTED but not in critical condition
0 %
% of companies SEVERELY NEGATIVELY AFFECTED or in critical condition
0 %
Total
0 %


End of Survey
We thank you for your time spent taking this survey.
Your response has been recorded.