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Venture Capitalists and COVID-19

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Abstract

We survey over 1,000 venture capitalists (VCs) on how the COVID-19 pandemic has affected their decisions and investments. Despite the historical importance of in-person meetings, VCs do not report difficulty finding quality entrepreneurs or major changes in time allocation. They do report difficulty in evaluating deals, more investor-friendly terms, and a decreased investment rate, with about one-sixth of VCs reporting pressure from limited partners to conserve capital. Although aggregate returns are largely unchanged, there is high dispersion both within and across funds. A follow-up survey shows faster-than-expected recovery in deal volume, terms, and returns.

I. Introduction

Many of the most innovative companies depend on a steady inflow of venture capital money. The sudden arrival of the COVID-19 pandemic dramatically shocked the global economy. Many commentators worried at the time that this shock would choke off the flow of venture capital. Venture capitalists (VCs) variously described COVID-19 as the "Black Swan of 2020" (Sequoia Capital (2020)) and claimed the

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global venture capital market "has completely locked up" (Dibner (2020)) in a "capital crunch" (Haque (2020)). If such dire predictions are borne out, it would have significant consequences for the innovation ecosystem. Accordingly, in this article, we explore the impact of COVID-19 on the venture capital industry by surveying a large fraction of active VCs in the United States and abroad.

Although venture capital investing is ordinarily subject to a great deal of uncertainty about the future, this uncertainty typically involves the quality of the management team, the development of nascent markets, or the potential of new technologies. The COVID-19 pandemic introduced a massive new uncertainty into the economy and, potentially, into venture capital investing. The nature of this uncertainty is likely substantially different from the type of uncertainty that VCs have historically evaluated.

In this article, we explore how that uncertainty has affected VCs and startups. Beyond whether VCs and startups have been helped or hurt by the pandemic, we explore how their business models have responded to this shock. Has an industry that has traditionally been based on networks, face-to-face meetings, and gut feel been able to adapt to meet the funding needs of innovative businesses in response to COVID-19?

We address this question using a primary survey of over 920 venture capital firms carried out in June 2020 and a follow-up survey of over 730 venture capital firms carried out in June 2021. We explore the extent of the shock on venture capital investments and how VCs responded to this shock. We also consider how VCs perceive the impact of the crisis and the expected duration of the shock, as well as how those perceptions change over time. Our surveys allow us to explore differences across types of investors (institutional VCs (IVCs) vs. corporate VCs (CVCs)), stage of investment (early-stage vs. late-stage VCs), and investment focus (information technology vs. healthcare VCs).

Our surveys build on a survey of IVCs conducted in late 2015 and early 2016 by Gompers, Gornall, Kaplan, and Strebulaev (GGKS) (2020). GGKS provide detailed information on VCs' practices in preinvestment screening (sourcing, evaluating, and selecting investments), structuring of investments, and postinvestment monitoring and advising.[1] GGKS (2020) also examine venture capital firms' internal management issues, for example, how VCs allocate their time and manage their relationships with the limited partners (LPs) who provide them with capital.

Like GGKS (2020), we survey a large number of VCs who make up a significant fraction of the industry. Supplementing GGKS (2020), we include responses from CVCs in addition to IVCs. These responses are included because CVCs have played an increasingly important role over the last several years, and they are underresearched. In the 2 survey waves, we received over 2,000 responses from VCs at over 800 IVC firms and over 100 CVC firms to learn how the COVID-19 pandemic affected their decisions and investments. We compare their survey answers to those provided by a large sample of VCs in early 2016 that was analyzed by GGKS (2020).

First, we consider how the pandemic is affecting new investments. VCs reported that during the first half of 2020, their investment pace was 71% of their normal, expected activity. They expected their investment pace to be 81% of their normal pace

[1]See Kaplan and Strömberg (2001) for the framework behind VCs' practices.

for the rest of the year. Roughly one-quarter reported that they struggled to evaluate new deals. This finding is consistent with the behavior of venture capital investment in past recessions, as shown by Howell, Lerner, Nanda, and Townsend (2020).

In the first survey, VCs expected the decline to be more modest and faster to rebound than in the dot-com bust of 2001 and 2002 (when investment declined by more than 50%) and the global financial crisis (when investment declined by 30% in 2009). Our follow-up survey confirms that this has indeed been the case: VCs report investing at just 6% off their normal pace in the first half of 2021 and expecting to invest at just 1% below their normal pace in the latter half of 2021.

Next, we asked the VCs about investment terms during the COVID-19 pandemic. Although the VCs expected investment terms to become more investor-friendly, the anticipated terms were actually more founder-friendly than those reported by GGKS (2020). This situation is consistent with the reversal of the longer-term trend toward founder-friendly terms. In our follow-up survey, the VCs indicated that contrary to their June 2020 expectations, the terms had not become more investor-friendly but, instead, remained founder-friendly.

We also asked VCs about the status of their existing companies. In the primary survey in June 2020, they reported that 52% of their portfolio companies were positively affected or unaffected by the pandemic, 38% were negatively affected but not in critical condition, and 10% were severely negatively affected or in intensive care. Consistent with half of the VCs' portfolio companies being hurt by the COVID-19 pandemic, VCs reallocated time toward helping portfolio companies.

Although many venture capital funds reported COVID-19 dramatically improving or dramatically hurting their returns, they expected the aggregate effect of the pandemic to be small, with internal rates of return (IRRs) lower by an average of 1.6% and cash-on-cash returns (multiples on invested capital (MOICs)) lower by 0.07. VCs also remained optimistic about their own performance (with 91% believing they would outperform public markets) and overall venture capital performance (with 75% believing the venture capital industry as a whole would outperform the overall stock market).

In our follow-up survey, we found that the VCs were not optimistic enough in their expectations at the time of the initial survey. They reported that 70% of portfolio companies were positively affected or unaffected, 24% were negatively affected but not in critical condition, and 6% were severely negatively affected or in intensive care. Consistent with these findings, they expected the pandemic to help their fund performance.

Throughout, we find modest differences between IVCs and CVCs. This finding suggests that CVCs have incorporated many of the practices of IVCs. We also find only minor differences between geographic regions that were more or less affected by COVID-19.

Overall, we conclude that the dire predictions of the impact of COVID-19 on venture capital have not materialized. Although the pandemic has not yet run its course and much uncertainty remains, our evidence suggests that the venture capital industry and its portfolio companies have been more resilient than many sectors of the global economy.

Our results support the idea that venture capital was spared from the worst effects of COVID-19 and even benefited because the industry thrives on

volatility and disruption. Startups backed by venture capital are known to have fluid business models that "pivot," in other words, change in response to market conditions and revealed demand. This flexibility may allow early-stage startups to take advantage of the opportunities created by the COVID-19–induced disruption. Supporting this idea, we see larger negative effects for late-stage VCs, who invested in companies that are more mature and closer to exit and thus have less fluid business models. In our conclusion, we also discuss how our results have additional implications for the state and development of the innovation ecosystem and high-growth companies.

The article proceeds as follows: In Section II, we describe our research design and report summary statistics. In Section III, we outline how VCs' investing activities have changed as a result of COVID-19, and in Section IV, we describe the impact on deal structure. In Section V, we report VCs' perspective on portfolio company performance and value-adding activities. In Section VI, we describe VCs' responses on their own time management, and in Section VII, we discuss VCs' perspectives on the future. In Section VIII, we explore the underlying economic mechanisms and conclude.

II. Methodology

A. Design

In this section, we describe the research design of our survey. The core of our survey was based on GGKS (2020), but it allowed us to estimate the impact of COVID-19. We eliminated the more technical questions and added questions regarding the COVID-19 pandemic. Our two waves had slightly different questions, designed not only to capture changes over time but also to react to emerging trends and to compare VCs' expectations to what actually happened. The final versions of both surveys are available in the Supplementary Material.

We administered the survey using Qualtrics, and we solicited all the survey respondents via email. We composed our mailing list using several sources. First, we used alumni databases from the Chicago Booth School of Business, Harvard Business School, and Stanford Graduate School of Business. The MBA graduates of these schools constitute a disproportionate number of active VCs. A study by PitchBook identified these schools as 3 of the top 4 MBA programs supplying VCs, with more than 40% of VCs holding an MBA from one of the 3 schools (see http://pitchbook.com/news/articles/harvard-4-other-schools-make-up-most-mbas-at-pe-vc-firms). We identified alumni related to venture capital and manually matched them to VentureSource, a database of venture capital transactions maintained by Dow Jones, and PitchBook, a database of private capital markets maintained by PitchBook. We ended up with 92, 801, and 1,005 individuals from the Chicago, Harvard, and Stanford business schools, respectively.

Second, we partnered with the Kauffman Fellows Program, which trains VCs and maintains a vibrant network of past fellows. The Kauffman Fellows Program emailed the survey to 680 alums on our behalf. Third, we used contact information on VCs from two large VC data sets, VentureSource and PitchBook. After excluding the people from the 4 samples indicated previously, we arrived at a sample of

7,945 VCs identified in the PitchBook sample. Finally, after excluding the people from all the aforementioned samples, we identified 7,028 more individuals in the VentureSource sample. We believe our survey encompassed the overwhelming majority of active VCs in the United States and many non-U.S. VCs.

We are confident that almost all of our survey respondents were VCs. First, we contacted only people identified as VCs by either the organizations that provided us their information or by VentureSource or PitchBook. Second, we asked respondents whether they worked at an institutional venture capital fund, a corporate venture capital vehicle, or neither at the start of the survey. Supporting the notion that our initial screen worked well, 87% of our respondents identified as working at either a corporate venture capital vehicle or an institutional venture capital fund. The remainder consisted of angel investors, private equity investors, or family office investors, and we excluded these respondents.

A significant concern about using a survey to measure the COVID-19 impact is that VCs who were particularly affected might have been more likely to respond. We checked for this nonresponse bias in two ways. First, we compared the respondents of our initial email with the respondents of our reminder email, based on evidence that people who ignore the first email are more likely nonresponders than people who answer the first email (Armstrong and Overton (1977)). These groups did not respond differently overall or, critically, on measures of fund or portfolio-company-level COVID-19 impact. Second, we compared our highest response subsample (Chicago alumni) to the other alumni samples (Stanford and Harvard), which had approximately one-third of the response rate. Again, we did not see significant overall or performance differences.

More generally, our respondents might not have represented the broader venture capital industry. Specifically, our sample was disproportionately biased toward the graduates of top MBA programs and the Kauffman Fellows, whom we explicitly targeted and from whom we received relatively high response rates as a result of our connections. Moreover, because both top MBA programs and the Kauffman Fellows Program are extremely selective, these alumni are potentially more successful than average VCs.[2]

Importantly, our sample, like the sample in GGKS (2020), represents a large fraction of all VCs. Based on PitchBook data, our U.S. VC respondents have a total of $340 billion in assets under management, about half the total for U.S. VCs. We had respondents from 70% of the top 50, 85% of the top 25, and 90% of the top 10 venture capital firms (ranked by the number of investments in PitchBook). At worst, then, we can say that our results represent the practices of a large fraction of the industry.

We administered the survey in 2 waves. Our main results are from our first wave, denoted June 2020, which was administered between June 29 and July 15, 2020. During this period, the COVID-19 pandemic was controlled or slowed down in Western Europe and most of Asia but was still active and growing in the United States. Therefore, most of our analysis focused on results from a time of great uncertainty. We supplemented these findings with results from a second wave, denoted June 2021, which was administered between May 18 and June 1, 2021. During this period,

[2]Gompers, Mukharlyamov, and Xuan (2016) show that VCs who are graduates from top colleges and top MBA schools perform better.

growing vaccination rates led to the reopening of many businesses, and an increase in stock prices occurred in both the United States and Western Europe.

To encourage completion, we offered those who completed the survey an early look at the results, after the survey was closed but before the results were released to the public. The survey was fully confidential, and all the reported results were based on the aggregation of many responses to exclude the possibility of inferring any specific respondent's answers. However, the survey was not anonymous to us, and we matched the survey respondents with VentureSource, PitchBook, and other data sources.

Our final response rates for the first wave were 35%, 13%, 14%, 6%, 5%, and 5% from the Chicago, Harvard, Stanford, Kauffman, PitchBook, and VentureSource samples, respectively. Compared with the survey we administered in 2015 and 2016, the response rate was slightly lower in some samples. One of the reasons is that the time horizon of the surveys was compressed to just 2 weeks, less than half the time allowed in GGKS (2020). At the same time, the response from the VC databases (VentureSource and PitchBook) was higher than that from the VC lists we used previously (VentureSource and the list provided by the National Venture Capital Association (NVCA)), likely because of our improved ability to filter VCs. As in GGKS, we received a much higher overall response rate from the schools with which we are connected.

Our response rate, although strong, was lower for the second wave, with responses from 660 IVCs and CVCs compared with 922 in the first wave. We believe the lower response rate was at least partially driven by the following: i) Kauffman was unable to send the emails in time; ii) Google started classifying the email as a "promotion," which may have affected deliverability for individuals using Google-based email addresses; and iii) email lists were from the previous wave and, therefore, slightly stale.

Our survey had up to 30 questions, and it took the median survey respondent 11 minutes to complete. The time per question was similar to the survey administered in GGKS (2020). The 25th percentile of the time for completion was 8 minutes, suggesting that our respondents took the survey seriously. As in GGKS, we also enjoyed a high completion rate of 75%.

B. Summary Statistics

In this section, we provide summary statistics of the sample and introduce the subsamples that we used in our analyses. We received 1,181 (839) individual responses to the first (second) wave. Table 1 describes how we filtered the responses. We excluded the 148 (101) respondents who did not self-report that they were IVCs or CVCs.[3] These investors were private equity investors, angel investors, or family office investors. The second part of Table 1 reports the composition of the final sample of 1,033 (738) IVCs and CVCs. We used all the answers from these VC respondents, with 78% (71%) of those respondents finishing the survey in its entirety. These are similar to the 885 responses and 64% completion

[3]Institutional venture capital firms are independent partnerships that manage venture capital funds on behalf of investors. VCs who manage funds are traditionally called *general partners* (GPs), and their investors are called *LPs*.

TABLE 1

Number of Respondents

Table 1 provides the count of survey respondents and the firms that they belong to for the June 2020 wave (first set of columns) and the June 2021 wave (last set of columns). Panel A looks at all responses and Panel B looks at our main sample of respondents at institutional or corporate VC funds.

	Panel A. June 2020				*Panel B. June 2021*			
	Individuals		Firms		Individuals		Firms	
	N	%	N	%	N	%	N	%
Total responses	1,181	100	1,049	100	839	100	749	100
Respondents at institutional VC firms	914	77	810	77	644	77	572	76
Respondents in corporate VC	119	10	112	11	94	11	88	12
Respondents at other investors	148	13	147	14	101	12	100	13
Sample: Respondents at institutional and corporate VC firms								
Total responses	1,033	100	915	100	738	100	656	100
Completed surveys	804	78	738	81	526	71	487	74
Surveys completed on behalf of someone else	29	3	29	3	18	2	17	3
Target seed- or early-stage	831	80	753	82	562	76	514	78
Only seed- or early-stage	611	59	561	61	403	55	377	57
Target mid- or late-stage	315	30	298	33	227	31	209	32
Only mid- or late-stage	97	9	91	10	67	9	63	10
Target software, IT, consumer internet	653	63	592	65	453	61	413	63
Only software, IT, consumer internet	226	22	212	23	147	20	143	22
Target healthcare	404	39	375	41	321	43	287	44
Only healthcare	94	9	88	10	90	12	77	12
Target financial	342	33	315	34	227	31	213	32
Target energy	120	12	114	12	106	14	99	15
MOIC helped by COVID	165	16	161	18	251	34	236	36
MOIC unchanged by COVID	226	22	218	24	128	17	124	19
MOIC hurt by COVID	291	28	279	30	69	9	68	10
California	319	31	278	30	206	28	183	28
Other U.S.	253	24	238	26	220	30	203	31
Foreign	381	37	347	38	312	42	284	43

rate in GGKS (2020). Only 3% (3%) of respondents in this sample indicated that they completed the survey on behalf of someone else.

In many cases, we received multiple responses from different individuals at the same venture capital firm, which means we had 915 (749) venture capital firms for our 1,033 (839) respondents. For venture capital firms where we had more than one respondent, we averaged the responses of the individual VCs to get a firm-level response.

We were able to match 97% of the firms to PitchBook. As mentioned earlier, our sample included 35 of the top 50 and 9 of the top 10 venture capital firms (ranked by the number of investments) in PitchBook. This is consistent with the possibility, noted earlier, that our sample was biased toward more successful firms.

Our first questions concerned the venture capital firm's investment focus. We asked respondents whether their firms specialized in a specific stage of company, industry, or geography. For example, we asked participants on which stages they specialized (seed, early, mid, late). Firms can specialize along multiple dimensions at the same time. In our sample of venture capital firms, 61% (57%) specialize in the seed or early stage, and 10% (10%) specialize in the middle or late stage. Geographically, our sample of venture capital firms is evenly distributed among California, the rest of the United States, and foreign locations.

Venture capital firms also often specialize by industry. Of the firms, 22% (22%) specialized in what can be broadly defined as the information technology (IT) industry, including software, IT, and consumer Internet ("IT" subsample). Some 10% (12%) specialized in healthcare ("Health" subsample). These were also the 2 most important subsamples in GGKS (2020).

We also considered separately IVC ("IVC" subsample) firms and CVC ("CVC" subsample) firms because they have different structures and often pursue different strategies. In recent years, CVCs have been playing a more prominent role in the innovation ecosystem. Approximately 11% (12%) of our sample was from CVCs; the rest was from IVCs.

Across many of our categorizations, the two waves reported similar results. A major exception was performance. We asked our respondents whether they anticipated that COVID-19 would ultimately increase or decrease the cash-on-cash multiple that their existing funds returned to LPs. Here, there was a meaningful shift. In our initial survey, 43% (15%) of the VCs reported that COVID-19 would decrease their cash-on-cash multiple (the "Hurt" subsample), whereas 24% (55%) reported that COVID-19 would increase their cash-on-cash multiple (the "Help" subsample). In the second wave, only 15% of the VCs expected a decrease in the cash-on-cash multiple, whereas 55% expected an increase. This marked change in VC optimism was reflected in several other responses we describe later in the article.

III. Investment Activities

Startups need capital both to respond to their own COVID-19 challenges and to fund solutions to the challenges COVID-19 posed to the overall economy. At the same time, COVID-19 lockdowns and infection fears have created significant challenges for VCs' historically face-to-face sourcing and selection processes. VCs typically meet 28 management teams for every closed deal (GGKS (2020)). Face-to-face interaction is sufficiently desirable that airline route changes appear to affect deal volume (Bernstein, Giroud, and Townsend (2016)), perhaps because gut feel (GGKS (2020)) and visual cues (Hu and Ma (2020)) are important drivers of VCs' decisions. Compounding this issue is the importance of networks in establishing connections between VCs and entrepreneurs (Howell and Nanda (2019)), with most venture capital deals coming from professional connections (GGKS (2020)).

We measured this impact by asking VCs how the pandemic had affected and was likely to affect their investment pace. Table 2 reports the VCs' responses on their investment rate at the time of the first survey (midway through 2020) and their expected rate for the remainder of the year relative to their expected rate of investment. This table and all following tables report averages and their standard errors (in parentheses). Most tables report means and test differences between subsamples using a 2-sample, equal variance *t*-test.[4] IVCs are compared with CVCs, Early with Late, IT with Health, Help with Hurt, California ("CA") with other U.S. states ("OthUS"), and foreign ("Fgn") with all U.S. based ("All").

Through the first half of 2020, VCs said they had invested at just over 70% of their normal investment pace. Late-stage and IT investors reported a larger decrease in their investment pace. Two-thirds of our respondents made fewer investments than previously. Late-stage, IT-focused, and California-based investors were more likely to have reduced the pace at which they make deals. Looking forward to the

[4]We use a *t*-test for all variables rather than using a binomial test for categorical variables. In practice, there is no difference between the two for our sample sizes.

TABLE 2

Impact of COVID-19 on Investment Rate

Table 2 provides the reported investment rates of venture capitalists (VCs) from the June 2020 wave (first columns) and the June 2021 wave (last column). The question whose responses are summarized in the latter rows was only asked in the June 2020 wave. Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020												June 2021
		Type		Stage		Industry		COVID-19 Impact		Location			
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
Investments made over past 6 months	5	5	4	5**	3**	4	4	5	6	5	5	6	5
	(0)	(0)	(1)	(0)	(0)	(0)	(1)	(1)	(1)	(0)	(0)	(1)	(0)
% change in investment rate	−29	−29	−34	−29**	−39**	−38***	−25***	−21***	−32***	−31*	−26*	−30	−6***
	(1)	(1)	(4)	(1)	(5)	(2)	(4)	(3)	(2)	(2)	(2)	(2)	(2)
Any reduction in investment rate	68	68	67	68*	78*	79***	57***	64*	73*	75**	66**	66*	41***
	(2)	(2)	(4)	(2)	(4)	(3)	(5)	(4)	(3)	(2)	(3)	(2)	(2)
% change anticipated for next 6 months	−19	−18	−22	−19	−21	−25**	−16**	−11***	−22***	−21	−21	−16**	−1***
	(1)	(1)	(4)	(1)	(4)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Number of responses	916	814	114	567	92	217	94	160	277	296	238	358	247
Reason Given by VCs Who Reduced Their Investment Rate													
Struggling to evaluate deals	42	43	35	37***	58***	46	50	42	46	48	45	38**	
	(2)	(2)	(6)	(3)	(6)	(4)	(8)	(5)	(4)	(4)	(4)	(3)	
Meeting fewer quality entrepreneurs	14	14	9	16	12	16**	3**	13	10	13	14	12	
	(1)	(2)	(4)	(2)	(4)	(3)	(3)	(4)	(2)	(2)	(3)	(2)	
Conserving dry powder/capital calls	25	24**	38**	28*	17*	20*	33*	25	25	20	27	29	
	(2)	(2)	(6)	(2)	(5)	(3)	(8)	(5)	(3)	(3)	(4)	(3)	
Focusing on startups closer to profitability	19	19	18	19	13	19	14	20	20	19	14	21	
	(2)	(2)	(5)	(2)	(4)	(3)	(6)	(4)	(3)	(3)	(3)	(3)	
No. of responses	547	487	65	325	58	145	36	85	193	183	147	200	

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second half of the year, VCs anticipated that their investment pace would be roughly 80% of normal, with IT investors again showing the largest reduction. For investors who made fewer investments, the most common reason was the difficulty of evaluating deals. This reason was particularly important for those most affected by COVID-19, and it certainly made sense, given the results of GGKS (2020) and the amount of time and effort required to perform due diligence for a deal.

In the June 2020 survey, late-stage investors indicated that it was more difficult to evaluate deals. This finding is unexpected because GGKS (2020) found that early-stage investors put more weight on the management team than late-stage investors. Given the difficulty of meeting teams in person, one might have expected early-stage investors to experience more trouble evaluating deals. Investors, particularly CVCs, were also concerned with conserving capital and making sure they had "dry powder" available for follow-on investments. Difficulty in meeting quality entrepreneurs was the least commonly reported reason. This finding is perhaps surprising, given the substantial frictions imposed on in-person meetings and VCs' focus on management team quality and other soft information from in-person meetings. Healthcare investors were especially unconcerned about meeting fewer quality entrepreneurs, likely because they placed relatively less importance on the quality of the management team than other VCs.

Importantly, by June 2021, the negative effect of the pandemic on investment had almost completely abated. The investment rate was up to just 6% below normal, with average VCs expecting their investment rate to return to normal for the latter half of the year. A decline followed by a recovery is consistent with the behavior of venture capital investment in past recessions, as Howell et al. (2020) showed. However, the extent of the present decline was expected to be more modest than in the dot-com bust of 2001 and 2002, when investment declined by more than 50%, and the financial crisis, when investment declined by 30% in 2009. A possible reason for this finding is that VCs did not expect the current crisis to depress earnings in technology-related sectors significantly, or they expected the pandemic to boost certain technology areas.

Geographic measures of COVID-19 impact were not associated with any of our impact measures. VCs in states or countries with relatively high COVID-19 case rates, death rates, lockdown periods, or year-over-year unemployment increases did not report a larger impact on the use of any of the measures in Table 2. This finding is perhaps surprising and is consistent with the largest impact of COVID-19 arising from national and international economic disruption and uncertainty rather than regional channels.

IV. Deal Structure

After VCs decide to invest in a company, they need to decide how to structure that investment. These deal terms directly affect a startup's cost of capital and founder incentives (Kaplan and Strömberg (2003), Ewens, Gorbenko, and Korteweg (2021)).

We first focused on pricing. The COVID-19–induced increase in uncertainty could have changed the amount of risk in deals and the pricing of that risk. Table 3 shows that VCs' required IRRs have, perhaps surprisingly, not increased from the

TABLE 3

Impact of COVID-19 on Required IRR

Table 3 provides information on the required internal rate of return (IRR) of venture capitalists (VCs) from the June 2020 wave (first columns) and the June 2021 wave (last column). The question whose responses are summarized in the latter rows was not asked in the June 2021 wave. Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020												June 2021
		Type		Stage		Industry		COVID Impact		Location			
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
Current required IRR	32	34***	23***	35	29	32	31	34	35	34	32	32	32
	(1)	(1)	(2)	(2)	(2)	(3)	(2)	(3)	(2)	(2)	(1)	(2)	(2)
No. of responses	445	398	49	240	63	111	45	95	163	131	111	189	301
Factors Affecting Required IRR													
Same for all investments	42	42	41	40	43	42	49	44	43	45	45	37*	
	(2)	(2)	(6)	(3)	(6)	(4)	(6)	(4)	(3)	(4)	(4)	(3)	
Investment's riskiness	53	52	52	48	51	51**	69**	57	58	47*	56*	54	
	(2)	(2)	(6)	(3)	(6)	(4)	(6)	(4)	(3)	(4)	(4)	(3)	
Correlation with public market	8	8	11	7	6	7	6	8	8	9	5	9	
	(1)	(1)	(4)	(1)	(3)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	
Financial market conditions	17	16	20	14	18	13	14	18	15	17	16	15	
	(1)	(2)	(5)	(2)	(4)	(3)	(4)	(3)	(2)	(3)	(3)	(2)	
Industry conditions	25	23**	36**	23	23	22	22	30	24	27	22	23	
	(2)	(2)	(6)	(2)	(5)	(3)	(5)	(4)	(3)	(3)	(3)	(3)	
Time to liquidity	42	42	41	40	43	42	49	44	43	45	45	37*	
	(2)	(2)	(6)	(3)	(6)	(4)	(6)	(4)	(3)	(4)	(4)	(3)	
Other	8	8	6	8*	3*	7	6	5	6	8	11	6	
	(1)	(1)	(3)	(1)	(2)	(2)	(3)	(2)	(2)	(2)	(2)	(1)	
No. of responses	631	567	71	367	71	151	65	131	228	194	164	264	

level measured by GGKS (2020) and do not vary across our 2 survey waves. This finding suggests that risk pricing has not dramatically affected the costs of capital supply. CVCs have a significantly lower required IRR hurdle (23%) than IVCs (34%). This result is consistent with the fact that CVCs have to consider strategic (nonmonetary) benefits when making investment decisions. It is also consistent with the fact that IVCs have to provide a greater value-added benefit to their companies.

We asked how VCs adjusted their IRRs for different factors and compared the responses to those in GGKS (2020). Given the significant increase in uncertainty and the changes in the nature of uncertainty, VCs may have changed their pricing of uncertainty.

Table 3 reports that over 40% of the VCs used the same financial metric to evaluate all investment opportunities, which is greater than the 23% reported in GGKS (2020). From a financial economist's perspective, it is a bit surprising that the percentage is so high and has grown over the last 5 years. Among those VCs for whom financial metrics vary, investment riskiness and time to liquidity were the primary considerations; however, the adjustments based on the investment's riskiness and the time to liquidity fell the most since the last survey. Industry and financial market conditions also mattered, but less so. This result almost exactly matches the results in GGKS (2020).

Consistent with our prior results, healthcare investors were more likely to adjust their required financial metric for the investment's riskiness than IT investors. CVCs reacted more to industry conditions. Overall, this finding might indicate that the increase in uncertainty means that VCs have decided to embed general uncertainty equally across all deals.

Beyond pricing, we asked VCs how frequently they used different contractual terms. Specifically, we asked about terms related to cash-flow rights (antidilution protection and cumulative dividends), control rights (other special investor rights), and liquidation rights (liquidation preferences, participation rights, and redemption rights). Antidilution protection gives VCs more shares if their companies raise a future round at a lower price. Full-ratchet antidilution is a particularly onerous form of this term. Cumulative dividends allow the annual dividend to accumulate, whereas noncumulative dividends effectively amount to no dividend. The liquidation preference gives investors a senior position in a sale or liquidation. Participation rights allow VCs to combine upside and downside protection in a sale or liquidation (so that VCs first receive their downside protection and then share in the upside). Redemption rights give investors the right to redeem their securities or demand the repayment of the original investment amount from the company.

Given the increase in uncertainty as a result of the pandemic, one might expect VCs to have predicted that these terms would have become stronger, that is, more VC-friendly. Table 4 confirms that intuition. In June 2020, 53% of VCs reported that they expected terms to become more investor-friendly the following year.

At the same time, the magnitude of those changes was expected to be small. Figure 1 shows that respondents to the June 2020 survey indicated that they expected terms to be more founder-friendly than those reported in our GGKS (2020) survey. This finding perhaps reflects the past 5 years of venture capital activity and competition that led to a general increase in founder-friendly terms. The

TABLE 4

Expected and Realized Financing Contracts for 2020:H2–2021:H1

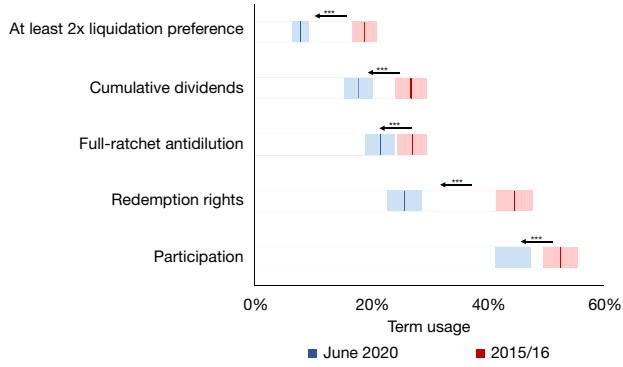
Table 4 compares the expectations of venture capitalists (VCs) for 2020:H2–2021:H1 (from the June 2020 wave, first columns) to VCs' reported realizations for that same period (from the June 2021 wave, last column). Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020 Expectation												June 2021
		Type		Stage		Industry		COVID Impact		Location			Realization
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
% change in follow-on-round valuations	−22	−22	−21	−22*	−17*	−19	−20	−16***	−27***	−21	−22	−21	3***
	(1)	(1)	(3)	(1)	(3)	(1)	(3)	(2)	(1)	(1)	(2)	(1)	(2)
% change in net asset value	10	10		10	12	10	10	18***	3***	10	11	9	28***
	(1)	(1)		(1)	(3)	(2)	(3)	(2)	(1)	(2)	(2)	(1)	(2)
Follow-on rounds more investor friendly	53	52	56	55	48	46	53	64	71	55	52	57	14***
	(2)	(2)	(5)	(2)	(6)	(4)	(5)	(4)	(3)	(3)	(3)	(3)	(1)
No. of responses	848	758	102	523	82	204	87	158	278	279	226	331	423
Frequency of Term Use													
Participation	45	44*	52*	47	41	37***	60***	42	44	41	40	53***	46
	(1)	(2)	(4)	(2)	(4)	(3)	(4)	(3)	(2)	(3)	(3)	(2)	(2)
Redemption rights	26	26	29	25**	35**	23	28	25	27	20***	33***	26	24
	(1)	(1)	(4)	(2)	(5)	(3)	(4)	(3)	(2)	(2)	(3)	(2)	(2)
Cumulative dividends	17	18	14	13***	27***	16***	29***	17	18	15**	23**	14**	16
	(1)	(1)	(3)	(1)	(4)	(2)	(4)	(3)	(2)	(2)	(3)	(2)	(2)
Full-ratchet antidilution	22	22	25	22	22	20	17	23	22	19	16	29***	18*
	(1)	(1)	(4)	(2)	(4)	(3)	(3)	(3)	(2)	(2)	(2)	(2)	(2)
$>1\times$liquidation preference	26	25**	34**	25	30	23*	30*	25	24	24	21	30***	20***
	(1)	(1)	(4)	(2)	(4)	(2)	(4)	(3)	(2)	(2)	(2)	(2)	(2)
$\geq 2\times$ liquidation preference	8	8*	12*	8	8	6	8	9	8	7	7	10*	6*
	(1)	(1)	(2)	(1)	(2)	(1)	(2)	(2)	(1)	(1)	(1)	(1)	(1)
Other special investor rights	21	20**	27**	20	25	16	21	21	19	15	19	26***	17
	(1)	(1)	(4)	(2)	(4)	(2)	(4)	(3)	(2)	(2)	(3)	(2)	(2)
No. of responses	675	596	85	403	71	152	77	143	245	202	182	283	388

FIGURE 1

Contractual Feature Use in 2015/2016 and the COVID-19 Era

Figure 1 reports the average hours per week institutional venture capitalists (IVCs) reported spending on each activity in our June 2020 wave. Those averages are compared with the 2015/2016 survey of IVCs by GGKS (2020). The shaded boxes denote 95% confidence intervals.



current COVID-19 pandemic does not appear to have caused the terms to "revert" to the same investor-friendly level.

More precisely, Table 4 reports the frequency of term use, with higher numbers corresponding to more use of VC-friendly terms. Participation rights were used most frequently in our current survey but in fewer than half of deals. In unreported results in GGKS (2020), participation was utilized 53% of the time. As in our prior survey, healthcare VCs were significantly more likely to include participation. Redemption rights and cumulative dividends were used, respectively, by 27% and 17% of the VCs, with late-stage VCs using both more frequently. Again, the prevalence of these terms was substantially lower than in GGKS (2020), in which 45% of respondents stated that they used redemption rights and 27% said they used cumulative dividends. Finally, VCs made some use of full-ratchet antidilution and senior liquidation preferences; again, these frequencies are lower than the frequencies we found in the earlier survey. In unreported analysis, we find that people who responded to both the 2015/2016 and 2020 surveys show the same significant decreases in the frequency of participation, redemption, full-ratchet antidilution, and high-liquidation preferences.

In terms of valuations, VCs in the June 2020 survey expected the valuations of the typical startup to fall by approximately 20%, reflecting either constraints among venture capital firms or worsening prospects for startups. There are no meaningful differences between subgroups, apart from the COVID-19–impact subgroups, where the "Hurt" sample was more pessimistic. VCs in regions hit harder by COVID-19 (as measured by case rates, death rates, lockdown periods, or year-over-year unemployment increases) did not report a larger impact on their companies. At the same time, consistent with COVID-19 having only a small aggregate impact, the average VC expected to mark up his or her net asset value (NAV) by approximately 10% over the next year.

The last column of Table 4 presents the results of the June 2021 survey. For both terms and valuations, the VCs turned out to be insufficiently optimistic. Only 14% of VCs reported that terms became more investor-friendly. Consistent with this finding, the individual terms in June 2021 were generally slightly more founder-friendly than expected in June 2020. As mentioned earlier, that means that the terms were substantially more founder-friendly than in GGKS (2020). Similarly, the final column of Table 4 indicates that round valuations did not decline but, rather, increased slightly (by 3%). Moreover, NAVs increased by 28% rather than the 10% expected in June 2020.

V. Portfolio Companies and Funds

Stock prices fell dramatically at the start of the U.S. spread of COVID-19, with the Russell 2000 Index of U.S. small-cap stocks falling more than 40% in less than a month. Although the index had recovered to approximately 85% of its prepandemic peak at the time of the June 2020 survey, many areas of the financial system still appeared fragile. Given the importance of venture capital, it is important to understand how these swings affected existing portfolio companies and funds. Past research by Korteweg and Sorensen (2010), Ewens, Jones, and Rhodes-Kropf (2013), and others has shown venture capital to have relatively high systematic risk, which might make it perform especially poorly under such swings. Conversely, Peters (2018) argued that the optionality of venture capital allows it to thrive in disruptive and volatile conditions, which might cause venture capital investments to outperform in the disruptive COVID-19 environment.

We first asked the VCs about the impact of the pandemic on their existing portfolio companies and their existing funds. Table 5 indicates that in the summer of 2020, VCs felt that 52% of their portfolio companies were not affected or were positively affected by the pandemic. VCs felt that 38% of their companies were negatively affected, but okay. Finally, VCs felt that 10% of their companies were very negatively affected. Unsurprisingly, VCs who reported being more hurt by COVID-19 also reported that more of their companies were doing poorly. Healthcare VCs indicated that their companies were less likely to be severely negatively affected (7%) than IT VCs (11%). These percentages are substantially more positive than we expected, particularly the small number of very negatively affected companies.

Although VCs reported that almost half of their portfolio companies were negatively affected by COVID-19, the average expected impact of COVID-19 on returns was surprisingly small. The VCs expected the pandemic to reduce IRRs by 1.6% and cash-on-cash multiples by 0.07. IT VCs expected a –2.1% effect on fund IRR at the median, whereas healthcare VCs expected just –0.5%.

Although average returns show little impact, the aggregation hides large heterogeneity. The median VC who expected COVID-19 to improve their cash-on-cash multiple expected it to increase his or her cash-on-cash multiple by 1.0 and IRR by 5%. The median VC who expected COVID to decrease his or her cash-on-cash multiple expected it to decrease the multiple by 0.50 and IRR by 5%. This dispersion suggests that the turbulence of the pandemic created winners and losers, with the winning companies and funds offsetting the losing companies and funds.

TABLE 5

Impact of COVID-19 on Funds and Portfolio Companies

Table 5 reports the average reported impact of COVID-19 on each measure of portfolio-company and fund health as of the June 2020 first wave (first columns) and the June 2021 second wave (last column). Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020												June 2021
		Type		Stage		Industry		COVID Impact		Location			
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
% of Companies Affected to Each Extent													
Not affected or positively affected	52	52	48	53	50	52	52	64***	42***	52	51	51	70***
	(1)	(1)	(3)	(1)	(3)	(2)	(4)	(2)	(1)	(2)	(2)	(1)	(1)
Negatively affected	38	38	40	37	40	37	42	29***	44***	38	39	38	24***
	(1)	(1)	(3)	(1)	(3)	(1)	(3)	(2)	(1)	(1)	(2)	(1)	(1)
Very negatively affected	10	10	11	11	10	11***	7***	7***	14***	11	10	11	6***
	(0)	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(0)
No. of responses	768	695	83	475	74	189	75	151	245	247	206	301	481
Impact of COVID-19 on internal rate of return	−1.6	−1.6		−1.7	−1.5	−2.1*	−0.5*	5.2***	−5.8***	−1.4	−1.2	−1.9	2.9***
	(0.2)	(0.2)		(0.3)	(0.8)	(0.5)	(0.7)	(0.4)	(0.2)	(0.5)	(0.4)	(0.4)	(0.3)
Impact of COVID-19 on cash-on-cash multiple	−0.07	−0.07		−0.06	−0.04	−0.05	0.04	1.19***	−0.85***	0.02	−0.00	−0.19	0.58***
	(0.04)	(0.04)		(0.05)	(0.09)	(0.08)	(0.10)	(0.07)	(0.04)	(0.08)	(0.07)	(0.07)	(0.06)
% expecting their investments to outperform stock market	91	91		91	95	93**	85**	96***	87***	92	93	90	93
	(1)	(1)		(1)	(3)	(2)	(4)	(2)	(2)	(2)	(2)	(2)	(1)
% expecting venture capital overall to outperform stock market	75	75		78	73	78	74	75	79	72	72	79**	84***
	(2)	(2)		(2)	(5)	(3)	(5)	(3)	(2)	(3)	(3)	(2)	(2)
% reporting limited partners requested fewer capital calls	16	16		17	13	20	13	16	20	17	17	14	5***
	(1)	(1)		(2)	(4)	(3)	(4)	(3)	(2)	(3)	(3)	(2)	(1)
No. of responses	848	758	102	523	82	204	87	158	278	279	226	331	423

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We also asked the VCs to look further into the future about their expectations for their fund performance and venture capital overall. In June 2020, VCs remained extremely optimistic about future performance. Some 91% of IVCs expected their investments to outperform the stock market, and almost 75% expected the venture capital industry overall to outperform the stock market. These expectations are largely unchanged from 5 years earlier, when GGKS (2020) found that 93% of the VCs expected to outperform, and 71% believed venture capital as a whole would outperform. These expectations are consistent with the relatively positive assessment of their portfolio companies. Interestingly, healthcare VCs had slightly lower expectations for their own performance in beating the stock market (85%) than IT VCs (93%). Even the VCs most affected by the pandemic held upbeat views.

Finally, given the volatility in the financial markets, we asked the VCs about the potential concern that their LPs would want to conserve liquidity and would prefer the VCs not to call so much capital. Only 16% of VCs reported that their LPs wanted fewer capital calls.

By June 2021, any overall negative impact of the pandemic on venture capital had effectively disappeared. VCs reported that the pandemic had a positive impact on IRRs and cash-on-cash multiples. Although the overall impact was positive, substantial heterogeneity remained, with approximately one-third of portfolio companies and VCs claiming the pandemic negatively affected them.

In the June 2021 wave, we also asked which factors they saw as most important to startup success during the pandemic. Table 6 shows that VCs felt the team was the most important factor, followed by the industry. Relative to the 2015/2016 survey,

TABLE 6

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

Table 6 reports the percentage of respondents to the June 2021 second wave who reported each factor as being the most important to the success of startups over the past year. This question was not asked in the June 2020 wave. Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Type		Stage		Industry		COVID Impact		Location		
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn
Team	44	43	51	42	36	42	40	39	42	39	46	46
	(2)	(2)	(7)	(3)	(7)	(5)	(7)	(3)	(6)	(4)	(4)	(3)
Business model	10	10	11	8***	24***	13	11	10	10	8	10	11
	(1)	(1)	(4)	(2)	(6)	(3)	(4)	(2)	(4)	(2)	(3)	(2)
Technology	10	10	13	11	7	11**	22**	13	9	13	7	11
	(1)	(1)	(4)	(2)	(4)	(3)	(6)	(2)	(4)	(3)	(2)	(2)
Market	6	6	9	4	9	8	5	7	9	8*	4*	7
	(1)	(1)	(4)	(1)	(4)	(3)	(3)	(2)	(4)	(2)	(2)	(2)
Industry	16	17*	7*	19	14	17	13	16	15	23*	15*	12*
	(2)	(2)	(3)	(2)	(5)	(4)	(5)	(2)	(4)	(4)	(3)	(2)
Timing	6	7	2	8	5	7	6	8	3	2***	10***	6
	(1)	(1)	(2)	(2)	(3)	(3)	(3)	(2)	(2)	(1)	(2)	(2)
Luck	6	6	6	7	6	2	0	5**	13**	7	7	5
	(1)	(1)	(3)	(2)	(3)	(1)	(0)	(1)	(4)	(2)	(2)	(2)
Board of directors	0	0*	2*	0	0	0	1	1	0	0	0	1*
	(0)	(0)	(2)	(0)	(0)	(0)	(1)	(1)	(0)	(0)	(0)	(1)
My contribution	0	0	0	0	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
No. of responses	468	413	56	266	44	95	56	222	67	131	142	203

however, we see decreased importance placed on the team (from 56% to 43%) and increased importance placed on non-team factors, particularly industry (from 7% to 16%). This finding highlights the extent to which COVID-19 helped some industries, such as delivery and communications, while it hurt others, such as travel and hospitality. Perhaps surprisingly, despite the large industry-specific effects of COVID-19, the team remained the most important individual factor behind startup success.

VI. Involvement with Portfolio Companies

A great deal of research, including Lerner (1995), Hellmann and Puri (2002), Kaplan and Strömberg (2004), Amornsiripanitch, Gompers, and Xuan (2019), and GGKS (2020), has shown that VCs are actively involved in managing their portfolio companies, frequently meeting with their portfolio companies' management and playing an important role in critical hiring and strategic decisions. In this section, we consider the effect of the pandemic on the venture capital portfolio companies and the actions that VCs have taken in response.

We asked the VCs how they were interacting with their portfolio companies during the pandemic. Table 7 indicates that in June 2020, half the VCs met with their portfolio companies once a week or more frequently, whereas almost 30% met multiple times per week. There are no significant differences across subgroups, although IVCs met slightly more often. The high level of involvement is consistent with previous work and anecdotal evidence. In our second wave in June 2021, consistent with the uncertainty that the pandemic had subsided, meeting frequencies dropped, with fewer VCs reporting meeting more than once a week and more VCs reporting monthly meetings.

TABLE 7

Involvement in Portfolio Companies During COVID-19

Table 7 reports the percentage of respondents who answered that they interacted with their portfolio companies at each frequency over the past 6 weeks as of the June 2020 first wave (first columns) and the June 2021 second wave (last column). Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020												June 2021
		Type		Stage		Industry		COVID Impact		Location			
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
Less than monthly	2	2	2	2	0	2	0	1	3	2	2	1	4**
	(0)	(0)	(2)	(1)	(0)	(1)	(0)	(1)	(1)	(1)	(1)	(1)	(1)
Once a month	10	10	11	12	7	12	7	11	10	10	11	9	16***
	(1)	(1)	(3)	(1)	(3)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(2)
2–3 times a month	34	33	38	33	36	33	27	33	34	38	33	29*	31
	(2)	(2)	(5)	(2)	(6)	(4)	(5)	(4)	(3)	(3)	(3)	(3)	(2)
Once a week	26	26	26	25	31	27	35	21	25	24	26	28	28
	(2)	(2)	(5)	(2)	(5)	(3)	(5)	(3)	(3)	(3)	(3)	(3)	(2)
Multiple times a week	26	27	22	27	23	24	25	30	26	23	27	28	18***
	(2)	(2)	(4)	(2)	(5)	(3)	(5)	(4)	(3)	(3)	(3)	(3)	(2)
Every day	2	2	0	1	1	3	4	3	3	1	1	3*	3
	(0)	(1)	(0)	(0)	(1)	(1)	(2)	(1)	(1)	(1)	(1)	(1)	(1)
No. of responses	747	665	92	458	74	176	83	162	279	245	203	306	486

TABLE 8

Activities of Portfolio Companies During COVID-19

Table 8 reports the average percentage of portfolio companies that respondents claim to have undertaken each activity with over the past 6 weeks, as of the June 2020 first wave (first columns) and the June 2021 second wave (last column). Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020												June 2021
		Type		Stage		Industry		COVID Impact		Location			
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
Hire board members	10	10	8	10	12	9**	15**	12	9	8***	12***	10	15***
	(1)	(1)	(2)	(1)	(2)	(1)	(3)	(2)	(1)	(1)	(1)	(1)	(1)
Hire managers	23	24***	15***	23	24	26	23	26	23	23	23	23	28***
	(1)	(1)	(2)	(1)	(3)	(2)	(3)	(2)	(1)	(2)	(2)	(1)	(1)
Hire employees	15	15**	10**	16	13	15	12	17	15	16	16	13*	16
	(1)	(1)	(2)	(1)	(2)	(2)	(2)	(2)	(1)	(1)	(2)	(1)	(1)
Fire employees	12	12	10	11**	17**	13	9	14	14	11	14	12	5***
	(1)	(1)	(2)	(1)	(3)	(2)	(2)	(2)	(1)	(1)	(2)	(1)	(1)
Connect customers	43	42*	49*	43	43	42	40	47**	41**	43	41	44	40*
	(1)	(1)	(3)	(1)	(4)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Connect investors	41	41	41	42***	30***	37**	44**	44	40	40	38	43**	43
	(1)	(1)	(3)	(1)	(3)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Connect with liquidity	30	30	31	29	30	26	30	30	29	26	27	35***	22***
	(1)	(1)	(3)	(1)	(3)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Connect with COVID-19 relief	33	33	27	33	36	27	32	33	35	28***	40***	31	11***
	(1)	(1)	(4)	(2)	(4)	(2)	(4)	(3)	(2)	(2)	(3)	(2)	(1)
Connect with equity investors	34	34	31	34	29	30***	40***	37	33	34*	29*	36**	36
	(1)	(1)	(3)	(1)	(3)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Strategic guidance	68	68	63	68	72	68	73	69	68	68	69	67	57***
	(1)	(1)	(3)	(1)	(4)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(1)
Operational guidance	46	46*	39*	45	46	48	47	46	46	48	47	43*	36***
	(1)	(1)	(3)	(2)	(4)	(3)	(4)	(3)	(2)	(2)	(3)	(2)	(1)
Help reduce burn rate	48	48	43	47	51	49	41	44*	50*	48	48	49	19***
	(1)	(1)	(4)	(2)	(4)	(3)	(4)	(3)	(2)	(2)	(3)	(2)	(1)
Other	6	6	3	7	5	6	6	10*	6*	6	6	7	5
	(1)	(1)	(2)	(1)	(3)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(1)
No. of responses	700	627	81	431	68	164	75	154	269	225	184	294	442

Table 8 examines VCs' interaction with their portfolio companies in June 2020 at a more granular level by asking what the VCs were actually doing for the companies. Providing strategic guidance was the most common activity, which VCs reported doing for almost 68% of their companies. VCs provided operational guidance for 46% of their companies, and they connected 43% with customers and 41% with investors. Table 8 also reports on pandemic-specific activities. Consistent with roughly half of their companies being sick or in intensive care, VCs helped almost half of their companies reduce their burn rate. They helped roughly one-third of their companies connect with liquidity, COVID-19 relief, and equity investors. We also paired questions around whether VCs were helping portfolio companies to hire or fire employees. Nearly 25% of VCs were involved in helping portfolio companies hire new employees, higher than the 15% of portfolio companies in which VCs were helping to fire employees. The importance of hiring, even in a pandemic, is consistent both with the need to cope with disruption and evidence on the relative difficulty startups have faced in hiring during COVID-19 (Bernstein,

Townsend, and Xu (2020)). We find that late-stage VCs were more likely helping their companies to fire employees (17%) than early-stage VCs (11%).

There was some variation across subgroups. CVCs were more active in providing connections to customers but less active in connecting new hires and providing operational guidance. Early-stage investors were more active in connecting to new investors. Interestingly, the responses of those most and least affected by the pandemic were very similar.

In the June 2021 wave, there was a large reduction in crisis-management activities and a slight increase in growth-supporting activities. We see significant decreases in VCs helping companies reduce their burn rate, fire employees, connect companies with liquidity or COVID-19 relief, and connect companies with both operational and strategic guidance, offset by minor increases in VC involvement in hiring managers and board members.

Overall, the results in this section are consistent with the VCs taking actions to help their portfolio companies and with those actions having changed somewhat in response to the pandemic.

VII. Time Use

As in GGKS (2020), we asked the survey respondents to describe their normal workweek structure.[5] Table 9 shows that in June 2020, VCs reported

TABLE 9

Time Use During COVID-19

Table 9 reports the average hours per week spent by respondents on each activity, as of the June 2020 first wave (first columns) and the June 2021 second wave (last column). Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	June 2020													June 2021
		Type		Stage		Industry		COVID Impact		Location				
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	All
Sourcing deals	14.4	14.4	14.6	14.0	15.4	13.0*	15.3*	14.7	13.7	15.4	15.2	13.0***	14.3
	(0.4)	(0.4)	(1.4)	(0.4)	(1.4)	(0.6)	(1.4)	(0.7)	(0.6)	(0.7)	(0.7)	(0.5)	(0.5)
Assisting portfolio companies	18.9	19.4***	15.3***	18.8	17.9	19.5	20.9	20.2	19.3	19.1	19.8	18.6	17.1***
	(0.4)	(0.4)	(1.1)	(0.5)	(1.4)	(0.8)	(1.7)	(1.0)	(0.7)	(0.7)	(0.9)	(0.6)	(0.5)
Networking	6.4	6.3*	7.3*	6.7*	5.6*	6.1	5.9	6.2	6.1	6.7	6.2	6.1	6.2
	(0.2)	(0.2)	(0.5)	(0.2)	(0.6)	(0.3)	(0.6)	(0.4)	(0.3)	(0.3)	(0.4)	(0.3)	(0.2)
Managing venture capital firm	10.1	9.9*	11.4*	10.2	10.8	8.9	10.4	9.7	10.2	9.8*	11.2*	9.7	9.7
	(0.3)	(0.3)	(0.9)	(0.4)	(0.9)	(0.5)	(1.0)	(0.5)	(0.4)	(0.5)	(0.7)	(0.4)	(0.4)
Meeting limited partners	5.2	5.2	5.3	5.2*	6.5*	5.3	4.9	6.1**	4.6**	5.6	5.5	4.8	4.2***
	(0.2)	(0.2)	(0.6)	(0.3)	(0.9)	(0.4)	(0.6)	(0.6)	(0.3)	(0.4)	(0.5)	(0.3)	(0.2)
Other	3.2	3.0**	4.6**	3.2	3.5	3.2	3.6	3.0	2.6	3.1	3.2	3.3	3.1
	(0.2)	(0.2)	(0.8)	(0.3)	(0.8)	(0.4)	(0.8)	(0.4)	(0.3)	(0.4)	(0.4)	(0.3)	(0.2)
Total hours	58.2	58.1	58.6	58.0	59.7	56.1*	61.1*	59.8*	56.4*	59.7	61.2	55.6***	54.5***
	(0.7)	(0.8)	(2.1)	(1.0)	(2.4)	(1.5)	(2.4)	(1.5)	(1.2)	(1.3)	(1.5)	(1.1)	(1.1)
No. of responses	722	646	84	443	73	173	79	152	266	232	193	295	457

[5]Hoyt, Gouw, and Strebulaev (2012) and Rust (2003) present some earlier evidence on VCs' time use.

working an average of 58 hours per week, with U.S. VCs reporting more than 60 hours. Healthcare VCs reported spending more time working than IT VCs (61 hours vs. 56 hours). The 59 total hours compared with the 55 total hours reported by the respondents to the 2015/2016 survey and to the second-wave June 2021 survey suggests that VCs worked harder in the pandemic but that their workload has broadly returned to normal.

In June 2020, VCs of all types spent the single largest amount of time working with their portfolio companies, at 19 hours a week. IVCs spent more time helping their companies than CVCs. Overall, the amount of time and involvement in portfolio companies is consistent with their reporting that they added value and helped their companies. Surprisingly, the reported 19.4 hours per week for IVCs is only 1 hour greater than the 18.3 hours reported in GGKS (2020) and 2 hours greater than the 17.5 hours per week reported in June 2021.

In June 2020, VCs still spent an appreciable amount of time sourcing and selecting potential deals despite the difficulties of traveling and in-person meetings caused by the pandemic.

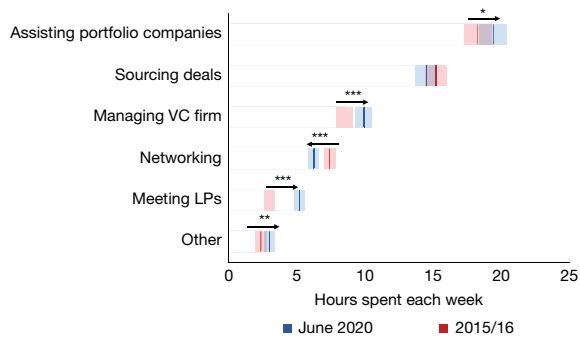
Sourcing and networking were the second- and fourth-most-important activities, at 14.4 and 6.4 hours per week, respectively, for a total of 20.8 hours per week. This finding is consistent with the VCs' expectations to continue investing in new deals in 2020. The combined 20.8 hours per week for IVCs is modestly lower than the 22.6 hours reported in GGKS (2020). Interestingly, those hours remained roughly the same, at 20.4 hours, in the June 2021 survey.

As Figure 2 shows, the additional hours spent by IVCs in the June 2020 survey appear to have gone to managing the venture capital firm and meeting with LPs. These come in at 10.1 and 5.2 hours, respectively, compared with 8.5 and 3.0 hours in GGKS (2020). This finding indicates that partners must manage real noninvestment activities within a venture capital firm and that the COVID-19 pandemic has increased the time devoted to those activities. Most firms have had to spend time adapting to remote work and restrictions imposed by the current pandemic, and venture capital firms are not immune to those challenges. As a robustness check, in

FIGURE 2

IVCs' Time Use in 2015/2016 and the COVID-19 Era

Figure 2 reports the average hours per week institutional venture capitalists (IVCs) reported spending on each activity in our June 2020 wave. Those averages are compared with the 2015/2016 survey of IVCs by GGKS (2020). The shaded boxes denote 95% confidence intervals.



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unreported analysis, we confirm that these results hold for the subset of respondents who completed both surveys.

The second-wave results of June 2021 show that VCs reduced their hours from what was possibly a peak in mid-2020 to more normal hours, as in GGKS (2020). At the same time, however, they still devoted more time to managing the venture capital firm than in GGKS.

VIII. Geographic Adaptation

In the second wave of the survey in June 2021, we took the opportunity to ask VCs whether the COVID-19 pandemic had affected their geographic focus and whether it had led them to move. The first rows in Table 10 show that approximately 1 in 20 VCs reported permanently moving to another state or province, approximately 1 in 20 reported temporarily moving, and approximately 1 in 10 considered moving.

We asked the VCs who had moved or were considering moving what their primary reason for moving was. They most commonly indicated taxes (at 33%) and family reasons (at 27%). Although taxes and family reasons were important reasons across all groups, there was substantial variation among subgroups. Taxes were relatively more important for VCs whose returns had benefited from COVID-19, for VCs who had not moved and were just considering moving, and for VCs who were in the United States. CVCs and foreign VCs reported that investment opportunities largely drove their desire to move, potentially reflecting their distance from U.S. innovation hubs. This finding paints a nuanced picture of the feasibility of states raising revenue through changes to tax rates. On the one hand, tax reasons were not yet the main driver of actual movers. On the other hand, it was the main reason given by about half of the VCs who considered moving.

Finally, approximately 39% of VCs reported that COVID-19 made them more willing to invest outside their home region. This trend was particularly prevalent among VCs focusing on IT and VCs who reported COVID-19 helping their financial returns. These figures are consistent with Han, Liu, and Tian's (2021) finding that Chinese VCs shifted to more remote investment during the pandemic, which has potentially significant implications for regional inequality.

IX. Discussion and Conclusions

Examining how the venture capital industry managed its response to the COVID-19 shock allows us to speak to the broader question of how economic agents behave in the presence of extreme uncertainty. The fact that we conducted a similarly styled survey under "normal" conditions and a second pandemic survey helps us by providing readily available benchmarks.

Our findings suggest that the impact of COVID-19 on the venture capital industry was expected to be, and has actually been, much smaller than that on many other sectors of the economy. These findings might seem counterintuitive because startups funded by VCs are small, young companies with a high propensity to fail in the best of circumstances. Beyond that, many sources of COVID relief excluded

TABLE 10

COVID-19 and Geographic Flexibility

Table 10 reports whether respondents moved or changed their investment behavior for respondents to the June 2021 wave. The final 3 columns report separate statistics for respondents who report permanently moving ("Perm"), temporarily moving ("Temp"), and considering moving ("Consd"). The relevant questions were only asked in the June 2021 wave. Averages and their standard errors (in parentheses) are reported. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

		Type		Stage		Industry		COVID Impact		Location			Type of Move		
	All	IVC	CVC	Early	Late	IT	Health	Help	Hurt	CA	OthUS	Fgn	Perm	Temp	Consd
Moved permanently	6	6	3	5	11	4	0	6	6	7	7	5	42***	0***	0***
	(1)	(1)	(2)	(1)	(5)	(2)	(0)	(2)	(3)	(2)	(2)	(2)	(0)	(0)	(0)
Moved temporarily	4	4	3	4	4	6	2	5	3	3	5	3	0***	24***	0***
	(1)	(1)	(2)	(1)	(3)	(2)	(2)	(1)	(2)	(1)	(2)	(1)	(0)	(0)	(0)
Considering moving	10	10	12	9	13	19*	7*	9	12	14	10	8	0***	0***	65***
	(1)	(1)	(4)	(2)	(5)	(4)	(3)	(2)	(4)	(3)	(2)	(2)	(0)	(0)	(0)
Have not moved	80	80	81	82	72	71***	91***	80	79	76	78	83*	0	0	0
	(2)	(2)	(5)	(2)	(7)	(5)	(4)	(3)	(5)	(4)	(3)	(3)	(0)	(0)	(0)
No. of responses	480	423	58	275	46	97	56	232	68	132	149	207	42	24	65
Reason Given by Venture Capitalists Who Moved or Are Considering Moving															
Taxes	33	34	21	23	33	32	57	47*	21*	41	36	20**	18**	22	47***
	(4)	(4)	(11)	(5)	(11)	(8)	(20)	(7)	(11)	(7)	(8)	(6)	(6)	(9)	(6)
Cost of living	7	8	0	8	0	6	14	9	21	11	5	5	3	13	8
	(2)	(3)	(0)	(4)	(0)	(4)	(14)	(4)	(11)	(5)	(4)	(3)	(2)	(7)	(3)
COVID-19 risk	5	4	7	3	11	3	14	2	7	4	8	2	3	22**	0**
	(2)	(2)	(7)	(2)	(8)	(3)	(14)	(2)	(7)	(3)	(4)	(2)	(2)	(9)	(0)
Family reasons	27	29*	7*	32	44	29	14	28	29	21	23	37*	40**	26	19*
	(4)	(4)	(7)	(6)	(12)	(8)	(14)	(7)	(13)	(6)	(7)	(7)	(8)	(9)	(5)
Investment opportunities	14	11***	43***	17	6	12	0	9	7	9	5	32***	20	9	13
	(3)	(3)	(14)	(5)	(6)	(6)	(0)	(4)	(7)	(4)	(4)	(7)	(6)	(6)	(4)
Other	14	13	21	17	6	18	0	6	14	14	23	5**	18	9	14
	(3)	(3)	(11)	(5)	(6)	(7)	(0)	(4)	(10)	(5)	(7)	(3)	(6)	(6)	(4)
No. of responses	130	116	14	63	18	34	7	48	14	47	40	44	42	24	65
More willing to invest outside home region	39	40	32	39	33	45***	24***	50***	31***	47*	39*	34**	43	58	47
	(2)	(2)	(5)	(3)	(6)	(4)	(5)	(3)	(6)	(4)	(4)	(3)	(6)	(6)	(6)
No. of responses	597	522	77	346	58	129	70	235	68	168	181	258	40	24	70

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VC-backed companies (see https://www.barrons.com/articles/what-the-cares-act-for-coronavirus-will-bring-to-small-businesses-51585255311 or https://nvca.org/wp-content/uploads/2020/03/VC-SBA-Lending-and-Affiliation-Guidance-for-SBA-Loan-Programs.pdf).

One explanation is that startups have been spared the impact of COVID-19 because of the nature of their business, for example, because they are able to pivot to remote work (Ding, Levine, Lin, and Xie (2021)), or because they have large cash reserves and little debt (Papanikolaou and Schmidt (2020)). However, they also might have been more affected because of added difficulties in hiring during uncertainty (Bernstein et al. (2020)) and because of the increased costs of independent innovation (Babina, Bernstein, and Mezzanotti (2020)).

Our results support the idea that venture capital was spared from the worst effects of COVID-19 because the industry thrives on volatility and disruption. VC-backed startups are known to have fluid business models that can pivot. This flexibility may allow early-stage startups to take advantage of the opportunities created by the COVID-19–induced disruption. Supporting this idea, we see larger negative effects for late-stage VCs, who invested in companies that were closer to exit and more mature and, arguably, thus have less fluid business models.

Our other survey results are consistent with COVID-19 affecting VCs primarily through an increase in volatility and uncertainty. First, our findings on reduction in venture capital investment are consistent with this increase in uncertainty because uncertainty increases the value of the option to wait (Abel, Dixit, Eberly, and Pindyck (1996), Bloom, Bond, and Van Reenen (2007)). More broadly, because VCs normally expect many of their portfolio companies to fail, the entire decision-making process of the venture capital industry is built around layers of uncertainty, from contractual flexibility to multiround fundraising to longer-horizon expectations. Therefore, these results show that the flexibility inherent in the system provides a buffer against extreme shocks as well.

Second, volatility and disruption may increase VCs' returns as a result of the option-like nature of VCs' contractual payouts (Peters (2018)), consistent with the mild long-term impact on returns that VCs predict. Third, the increased use of VC-friendly terms that VCs expected (but that did not materialize) is consistent with more uncertainty or asymmetric information (Kaplan and Strömberg (2004)). Again, the fact that the legal system allows for contractual flexibility as a function of shocks and movements in supply and demand protects the system against severe shocks.

Recent research has also emphasized the importance of networks and interpersonal contact (Bernstein et al. (2016), Hu and Ma (2020), GGKS (2020), and Howell and Nanda (2019)). We might therefore have expected that COVID-19 would lead to a breakdown of VC–entrepreneur matching. However, our evidence suggests these frictions have not played a major role. First, the deal flow reduction we see is smaller among early-stage firms. Second, difficulty in finding entrepreneurs is not the main reported reason for a decrease in venture capital deal flow. Third, the fact that responses are not associated with regional variations in COVID-19 intensity or lockdowns suggests that the barriers to in-person contact are not the main driver. Finally, the VCs in our survey's second wave in June 2021 indicated that they would be more likely to invest outside of their geography,

suggesting that COVID-19 has allowed VCs to expand their network using Zoom and other technologies.

There is more evidence for a rise in fund-level frictions, ranging from VC–LP relationships to fund-level preferences. For example, VCs reported spending dramatically more time meeting with LPs. This finding further supports the idea that LPs who invest across a wide spectrum of asset classes are more concerned about venture capital performance than VCs themselves. Historically, the entire venture capital asset class has shown both mediocre returns (Harris, Jenkinson, and Kaplan (2014)) and relatively high systematic risk (Korteweg and Sorensen (2010), Ewens et al. (2013)). The secular rise in LPs' commitments to venture capital funds may seem puzzling in light of the apparent unattractiveness of the asset class. VCs' relatively strong performance during COVID-19 points to a potential solution to this puzzle. If rare but severe disasters drive required returns (Barro (2009)) and the impact of COVID-19 is closer to such a disaster than the dot-com bust or the 2008 financial crisis was, then venture capital may be serving as a hedge against major economic disruption (Peters (2018)).

Given the importance of VCs in the global innovation ecosystem and economy, it will be interesting to see whether these impacts persist, and it will be important to follow subsequent industry developments. As several VCs stated in their comments at the end of our survey, it may be too early for them to appreciate the full extent of the pandemic.

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