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VC Returns by Series: Part II
How sector and vertical breakdowns affect adjusted returns

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Credits & contact

Analysts
CAMERON STANFILL, CFA ANALYST II, VC
cameron.stanfill@pitchbook.com
DARREN KLEES Senior Data Analyst

Contact PitchBook

RESEARCH
reports@pitchbook.com

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Key takeaways

- **Emerging technologies show robust results compared to broader tech startups.** Drilling down to the vertical level, we see impressive VC return metrics from fintech and AI & ML startups, outperforming the overall technology space. Given the nascence of these areas, the natural progression will be for competition to increase and drive down performance, but for now investors have been rewarded.

- **Life sciences investments outperform on an adjusted basis.** The perception around life sciences ventures is that the sector has an exceptionally risky profile; however, our data indicates this group has seen a higher proportion of companies find success in recent years relative to their technology company peers, resulting in a more favorable out-of-business (OOB) adjustment and driving relative outperformance in the space.

- **Evidence mounts for specialization as a differentiator.** All the slices broken down in this note highlight starkly different risk and return characteristics, which we believe illustrates the varied and unique exposure VC investors achieve through sector selection and concentration. This is also key for LPs to consider when making allocation decisions.

Introduction

In the first edition of this series, we provided a framework with which to analyze returns for investors at different stages of venture on an aggregate basis, and we saw the drastic effect that batting averages have on final VC returns. To expand upon those findings, we broke the data down along select sectors and verticals. Investing around theses on industries or business models is one of the most common VC strategies, and a way that GPs differentiate themselves. In this analysis, we work to determine the different risk and return profiles of these industry specializations and how they compare to VC in aggregate.

A recap of Part I

As a refresher, the annualized returns in aggregate are extremely strong for the early-stage investors in companies that achieve a successful exit. However, the trend reverses when we adjust for all the companies that don't exit and the capital investment that went into those deals, which we account for with the OOB adjustment. Here, the risk of investing in VC becomes clearer based on the failure rates implied by our data.

To calculate the OOB adjustment, we started with the output from a VC funnel analysis to get a baseline number for success rates at every round—or more specifically, the number of companies that either raise a subsequent round or exit. We then compounded the success rates at each round and all the subsequent rounds to find the total risk that a company does not exit (e.g. for a Series C investment, the total risk is the Series C success rate multiplied by the Series D success rate, multiplied by the Series E success rate, and so on). Using those compounded success rates, we calculated an estimate of the capital investment for the deals that did not exit. For example, the Series A success rate of 24.4% implies that 75.6% of investments don't exit, which we account for by increasing the capital investment proportionally. If there was $100 million of capital investment in Series A companies that exited, we divide that value by the adjustment (24.4%) to get an adjusted capital investment of $409.8 million.

The key takeaways from the first note in the series, with updated statistics, are as follows:

- The data illustrates a lower percentage of successful exits than the oft-quoted "1/3, 1/3, 1/3" heuristic, with around 25% of all deals returning more than 1x and only one in every eight reaching 5x return.

- For companies that reach an exit, we see significantly superior returns from earlier-stage deals, with Series A financings posting an impressive 33.7% annualized return and Series B coming in next at 23.2%. Returns continue to decrease as investors move later in the VC lifecycle, culminating with the Series F category posting around a 14.8% annualized return.

- The relative outperformance of returns from the early stage reverses completely with the adjustment for failure rates, moving Series D and Series F returns to the most favorable values, with Series A and Series B posting barely positive figures.

Aggregate VC returns by series
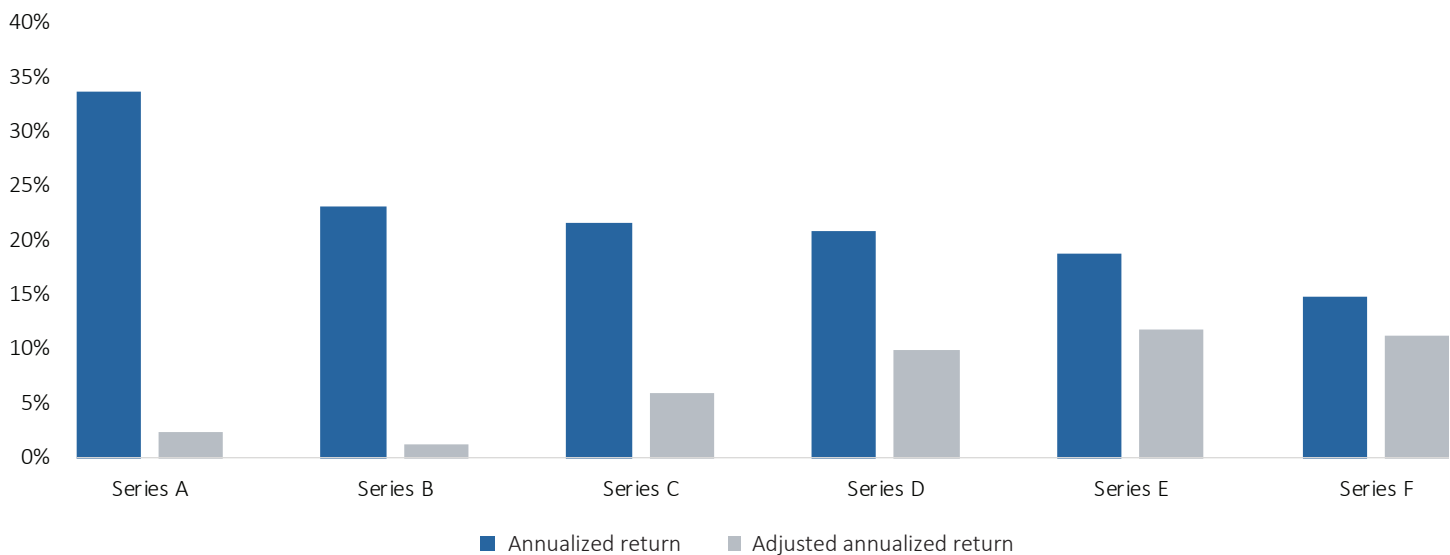
Aggregate VC returns by series

	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	364.1%	13.4%	33.7%	2.4%	24.4%
Series B	172.6%	6.2%	23.2%	1.3%	39.0%
Series C	140.2%	29.9%	21.7%	6.0%	54.1%
Series D	108.5%	44.5%	20.9%	10.0%	69.3%
Series E	78.4%	46.0%	18.7%	11.9%	81.8%
Series F	54.6%	40.2%	14.8%	11.3%	90.7%

For the purposes of this note, we limit the discussion to the technology, life sciences, fintech, AI & ML and cybersecurity industries, the areas where we were most comfortable with the data quantity and quality, but the data can be sliced to match nearly any preference.

2019 VC activity summary by industry

	All US VC	Technology	Life sciences	Fintech	AI & ML	Cybersecurity
Deal value ($B)	$138.5	$111.9	$22.2	$17.4	$18.6	$5.0
Deal count	11,156	8,175	1,586	926	1,382	320
Median deal size ($M)	$3.0	$3.3	$4.1	$4.2	$4.2	$7.0
Median age of companies at series A (years)	4.1	4.2	4.0	3.4	3.8	3.7
% of deals in early stage	33.9%	34.7%	36.2%	39.5%	42.8%	41.3%

Technology

To start, we broke out businesses within the technology sector, which we define as companies in the information technology industry or tagged to a technology-related vertical (e.g. 3D printing, ridesharing, foodtech). The digitization of enterprise processes and the current ubiquity of software has catapulted this group to the dominant position within venture on a capital and count basis. Technology is one of the most common areas of focus for venture investors and a sector from which many of the biggest recent VC exits have originated. The presence of homeruns is a promising sign, but the frequency with which they occur is a similarly important metric for aggregate VC returns.

Technology VC returns by series
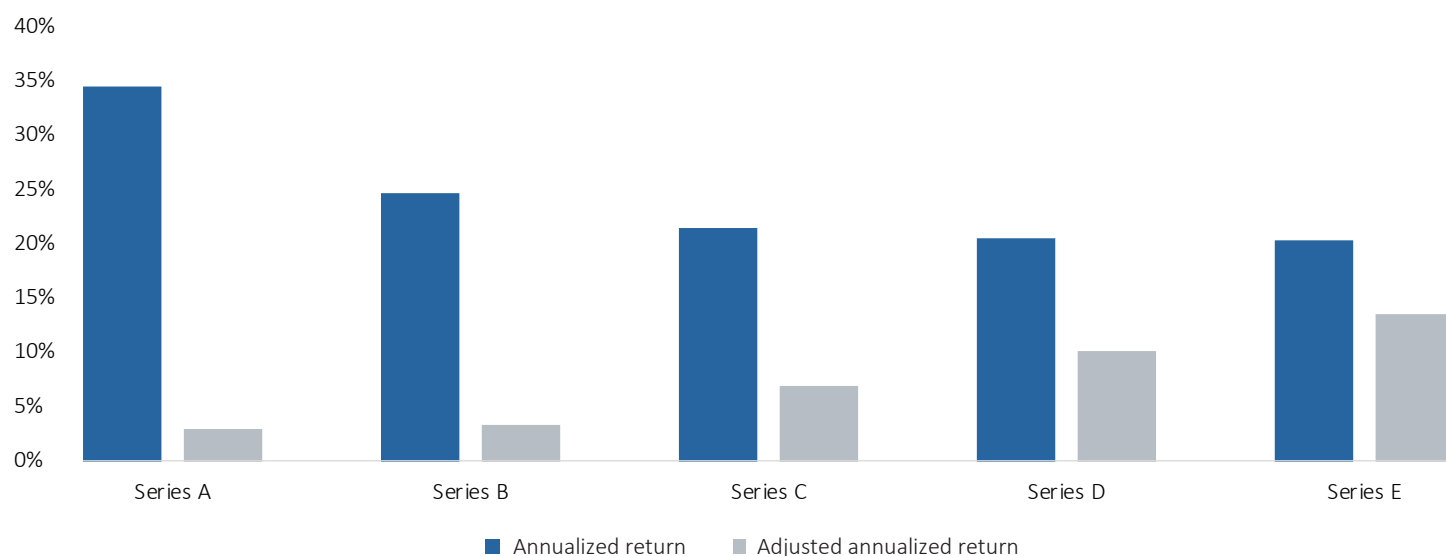
Source: PitchBook | Geography: Global
*As of December 23, 2019

Technology VC returns by series

	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	371.2%	16.9%	34.5%	3.0%	24.8%
Series B	199.2%	17.4%	24.7%	3.3%	39.2%
Series C	151.7%	37.0%	21.5%	6.9%	54.4%
Series D	111.9%	47.1%	20.6%	10.1%	69.4%
Series E	89.0%	54.4%	20.3%	13.5%	81.7%

Source: PitchBook | Geography: Global
*As of December 23, 2019

Looking at the data, we do see higher unadjusted returns across all series for technology businesses when compared to the full dataset, implying that many of the biggest winners came out of this category. Technology makes up a large proportion of total VC data, so it follows that the OOB adjustment is nearly identical to the aggregate VC OOB adjustment, resulting in outperformance by technology on an annualized adjusted basis, as well.

Life sciences

The second-largest sector focus within VC investing is the life sciences space, which includes companies with an emphasis on pharma & biotech, healthcare devices and healthcare services. This group of companies usually offers investors more varied business models and investment risks than a technology business, but the sector has proven to be similarly lucrative for VC investors. The starkest outperformance over the other categories comes in the adjusted returns, since our VC funnel implied higher success rates for the life sciences sector relative to aggregate VC returns.

Investors often perceive healthcare ventures as inherently risky, especially surrounding the biotech space, given explicit and visible binary outcomes from clinical trials and FDA approvals. However, by utilizing a more favorable OOB adjustment, our data indicates that this group has seen a higher proportion of companies find success in recent years relative to their technology company peers.

Life sciences VC returns by series
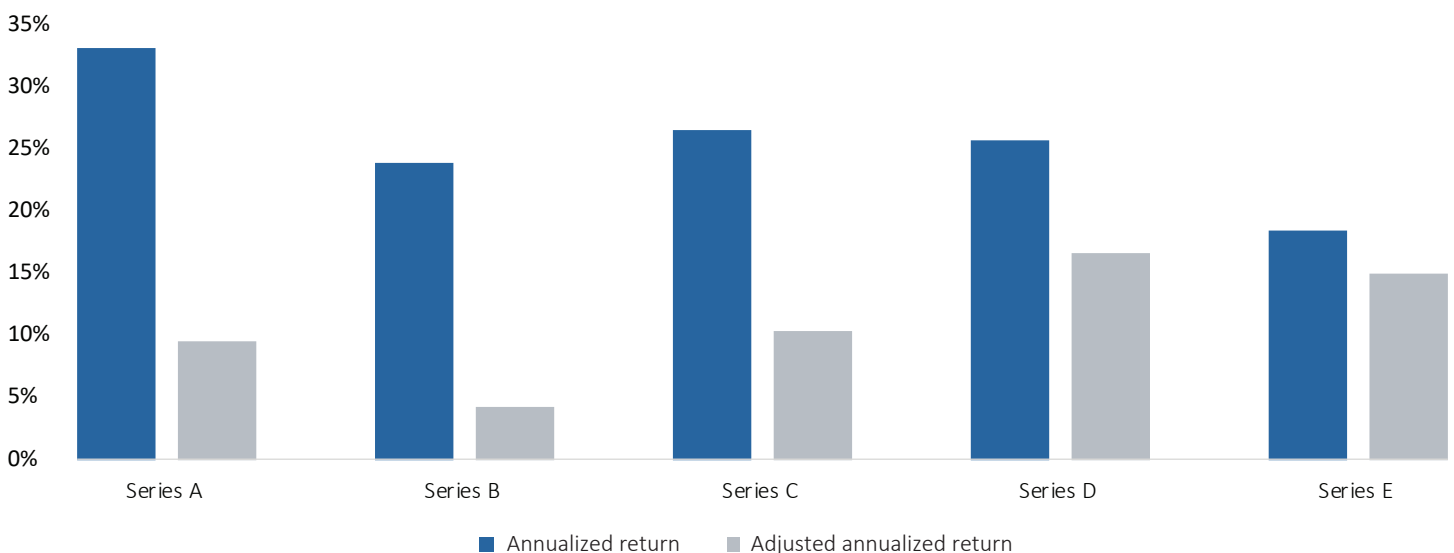
Legend: ■ Annualized return ■ Adjusted annualized return

Source: PitchBook | Geography: Global
*As of December 23, 2019

Life sciences VC returns by series

	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	383.3%	64.7%	33.1%	9.5%	34.1%
Series B	153.0%	19.7%	23.9%	4.3%	47.3%
Series C	136.3%	43.0%	26.6%	10.3%	60.5%
Series D	112.6%	66.3%	25.7%	16.6%	78.2%
Series E	56.1%	44.4%	18.4%	15.0%	92.5%

Source: PitchBook | Geography: Global
*As of December 23, 2019

While it's difficult to fully attribute this difference to any one factor, the importance of scientific knowledge and the specialization of VC investors in the space (i.e. fewer nontraditional investors) has allowed GPs to effectively navigate what should be a riskier area of startup investing. This has been especially clear in early-stage VC, where GPs have focused a growing proportion of investments into startups led by serial entrepreneurs, indicating a preference in an attempt to reduce risk.

When applying these elevated success rates, the adjusted annualized returns for life sciences see the most significant gap over aggregate VC in Series A and Series D, with 7.1% and 6.7% outperformance, respectively. Interestingly, both of these series display a materially more favorable OOB adjustment relative to the aggregate VC OOB statistic, confirming that this variable drove a significant amount of the outperformance in the healthcare sector. This implies that the advantage could go away with some sensitivity analysis around the adjustment figures; however, it also illustrates that gross returns are equal or only marginally lower than the broader VC returns and suggests no real discount in realized returns given the lower risk indicated by our data.

Fintech

To narrow the technology industry further, we sliced the data by verticals within the sector. First, we analyzed the fintech vertical, which includes technology companies that sell into the financial services industry. Companies in this space have advanced and capitalized on the rise of digitization across the banking and investment industries and have significantly transformed how consumers and businesses interact with financial services. These important innovations have created opportunities for outsized investment returns, as can be seen in our returns data.

Fintech investments have achieved some impressive returns over the short term compared to broader technology statistics, ranging from 30.0% to 50.5% annualized returns. On an adjusted annualized basis, we still see the later stages notching better performance, but returns start to plateau between Series C and D as the risk and return tradeoffs seem to even out. It is important to note that sample sizes become smaller as the analysis narrows on specific sectors, which is why we only extend this analysis to Series D and applied the same success rates as the aggregate technology universe. Regardless, realized fintech investments have achieved robust returns, contributing to sustained momentum of capital investment in the space.

Fintech VC returns by series
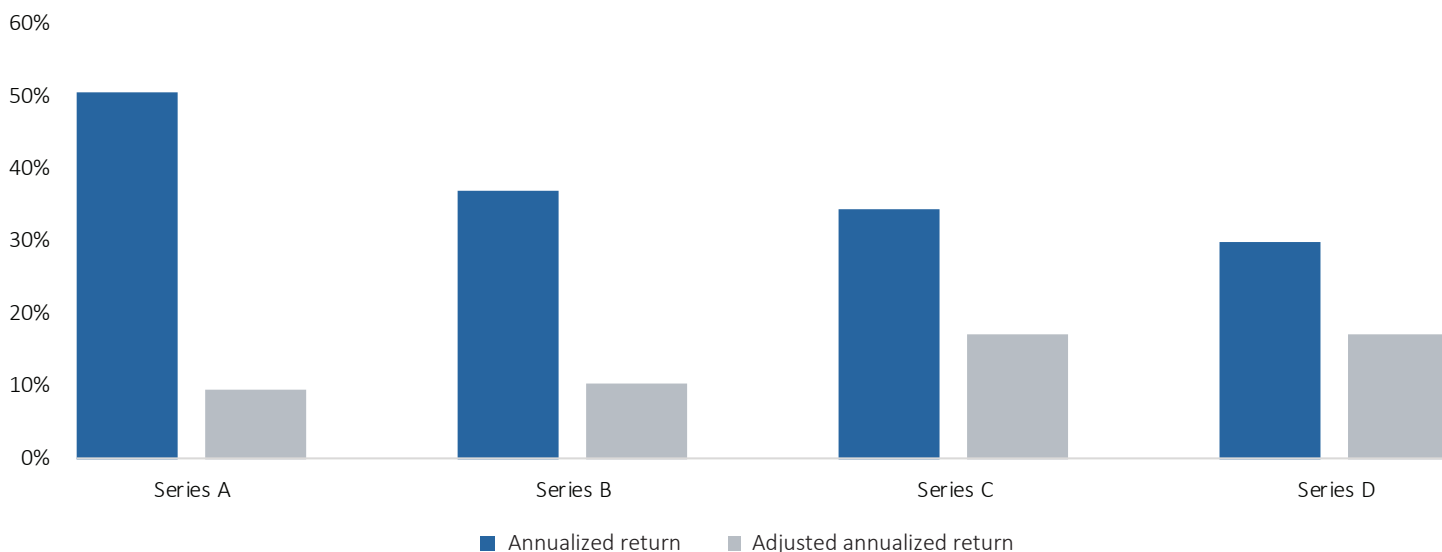
Source: PitchBook | **Geography:** Global
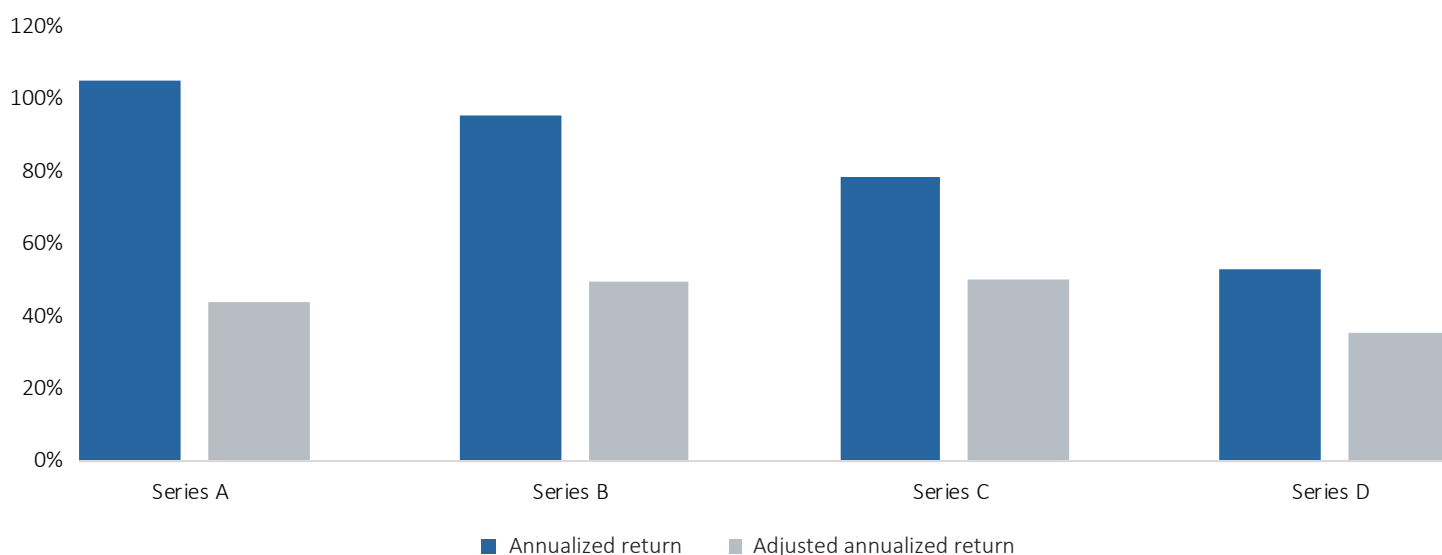*As of December 23, 2019

Fintech VC returns by series

	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	502.6%	49.5%	50.5%	9.6%	24.8%
Series B	287.8%	52.2%	36.9%	10.2%	39.2%
Series C	270.4%	101.6%	34.5%	17.2%	54.4%
Series D	149.7%	73.4%	30.0%	17.1%	69.4%

Source: PitchBook | **Geography:** Global
*As of December 23, 2019

Artificial intelligence & machine learning

Next, we looked at the AI & ML vertical, which has seen a precipitous growth in VC investment of over 1,400% from 2013 to 2018. Of those myriad AI & ML businesses that received funding, many achieved impressive exits. The gross and adjusted returns for this segment are the highest of the slices we analyzed in this research, with adjusted annualized returns coming in at 35.6% for Series D at the lowest and ranging up to 50.2% on Series C investments.

AI & ML VC returns by series

■ Annualized return   ■ Adjusted annualized return

Source: PitchBook | Geography: Global
*As of December 23, 2019

AI & ML VC returns by series

	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	1,567.9%	313.8%	105.4%	43.8%	24.8%
Series B	933.9%	305.7%	95.6%	49.5%	39.2%
Series C	678.4%	323.7%	78.3%	50.2%	54.4%
Series D	266.0%	154.1%	52.8%	35.6%	69.4%

Source: PitchBook | Geography: Global
*As of December 23, 2019

While AI & ML annualized returns follow the classic downward slope from Series A to Series D, the adjusted returns for the segment remain markedly steadier across all series. This suggests that the increased risks of investing at earlier stages are currently more fully compensated by the eventual returns of AI & ML exits. This difference also puts Series B and C at the highest-performing series

on an adjusted basis within the AI & ML space, compared to the aggregate VC data in which these series are difficult entry points. As an emerging industry, all the exits and returns data we gathered include the first wave of VC-backed AI & ML startups to successfully exit, which likely skewed the results higher due to the level of hype surrounding the space in the past decade. The nascence of the vertical also contributes to an element of survivorship bias, as many startups may not have had time to fail yet, which we chose to correct by utilizing the broader technology OOB adjustment to account for an eventual mean reversion.

Cybersecurity

The last vertical breakdown in this edition investigates the performance of investments into cybersecurity companies. Out of all slices covered, these deals resulted in the only negative adjusted return metrics, with Series A and B values dipping just below zero on the back of slightly below-average gross return figures for those earliest stages. However, this relative underperformance flips at the Series C and D levels, with more mature investments generating above-average returns. While cybersecurity remains a sector with an abundance of innovation and change, it is crucial to note that the space is more developed than the other verticals mentioned in this note and includes several strong incumbents. Huge returns at the Series A and B levels may be harder to come by, especially as market leaders acquire earlier in the company lifecycle or effectively compete in new business segments internally to limit startups' competitive advantages. Going forward, cybersecurity will remain a pivotal technology as our world continues to become more digitized, but likely will encounter sustained elevated levels of competition.

Cybersecurity VC returns by series
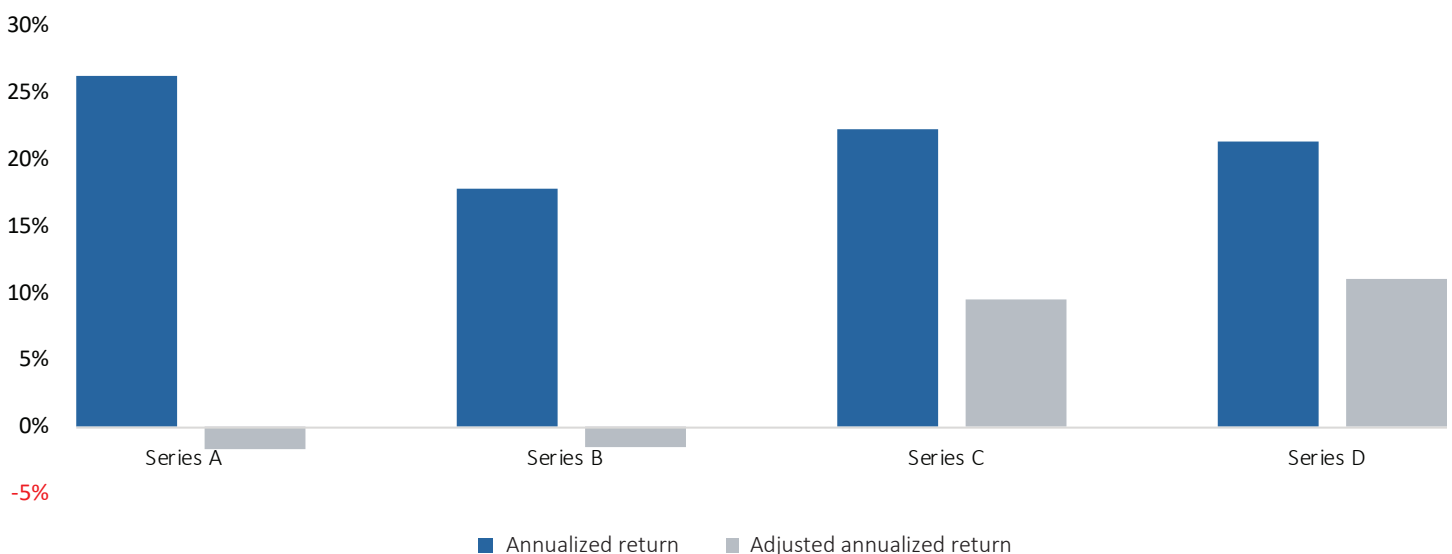
■ Annualized return   ■ Adjusted annualized return

Source: PitchBook | Geography: Global
*As of December 23, 2019

Cybersecurity VC returns by series

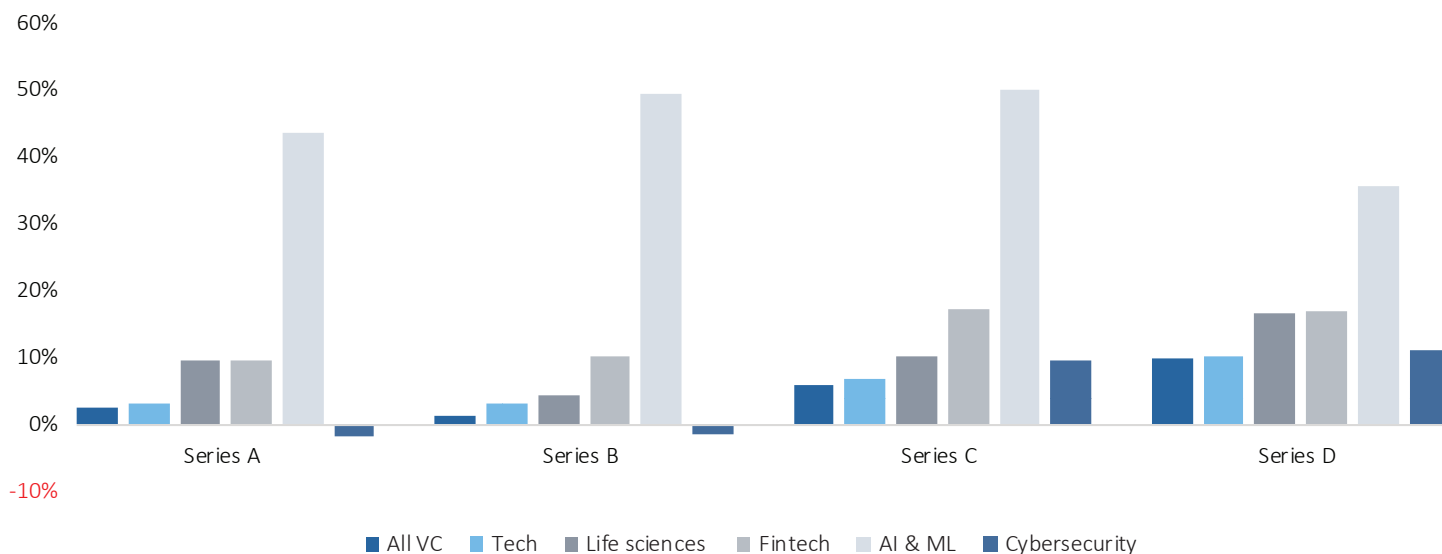|	Total return	Adjusted return	Annualized return	Adjusted annualized return	OOB adjustment
Series A	266.6%	-9.1%	26.2%	-1.7%	24.8%
Series B	135.2%	-7.7%	17.8%	-1.5%	39.2%
Series C	205.4%	66.2%	22.3%	9.6%	54.4%
Series D	122.2%	54.3%	21.4%	11.1%	69.4%

Source: PitchBook | Geography: Global
*As of December 23, 2019

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Conclusion

Explicit sector specialization or investing around a certain industry thesis are some of the most common ways investors differentiate themselves from their peers; and, as the data emphasizes, these focused approaches can achieve diverse outcomes. Technology has become so pervasive in the VC investment landscape that it essentially drives the aggregate and likely no longer suffices as a niche on its own. However, technology verticals have proliferated and provide some intriguing options for specialization. Healthcare also remains an enticing option, posting stronger returns than the aggregate and continuing as an area in which scientific expertise can be a key differentiator. Going forward, we expect GPs to continue carving out sector- and vertical-focused strategies to sell themselves to LPs and seek out above-market returns.

Adjusted annualized returns by series and industry

Source: PitchBook | Geography: Global
*As of December 23, 2019