



# Tech Ecosystem Review

The Key Market Trends Defining  
Emerging Technology Segments

Data provided by  PitchBook.





# Foreword

2020, 2008, 2001, 1991, 1987. Investors remember these years. Markets were volatile, economies shaken, and each changed the world in a lasting way.

During periods of stress and crisis, the global economy looks to innovation and responds with accelerated adoption of new technological trends. Each crisis preceded a new wave of global technology: the 1987 stock market crash drove enterprise networking technologies; 1991 and the Persian Gulf War spurred the software revolution; the dot-com collapse and 9/11 characterized 2001 and foreran the internet age; the 2008 global financial crisis directly preceded social media and smartphone adoption.

Now, 2020 has further accelerated e-commerce. Remote working is a “thing.” Zoom is a verb. Once again, a time of global stress pulls forward a decade of change. We used to say remote work would happen “in the future,” bandwidth will make distance irrelevant “in the future,” e-commerce would remake retail “in the future.” Well, the future is now.

The post-COVID-19 world will not revert to “normal.” We have found that online connectivity and communications work, and in many cases, they dramatically improve efficiencies while reducing expenses. This and related sustained disruptions are causing a material acceleration in what the famous economist Joseph Schumpeter called “creative destruction,” or the “process of industrial mutation that incessantly revolutionizes from within, increasingly destroying the old one, increasingly creating a new one.” The post-COVID-19 era will likely prove similar to the one that followed WWII, when a vast set of new technologies developed in response to crisis were unleashed into commercial

applications. Therefore, we are likely in a period of rapid non-inflationary growth that could persist for years, driven by recent technological innovations (and those to come) with massive global applications. Much of the recent appreciation of equity valuations could confirm this mega-trend.

How these innovations reach the market is known. As technology investors, we understand how new markets form—a new technology passes from passionate enthusiasts to early adapters to mainstream adoption, with each stage reliant on the degree of product-market fit. Mainstream adoption can take a decade or a year, the former in normal times and the latter during periods of extreme economic distress.

Why? Because periods of distress force change upon us, necessitating the creation and utilization of new tools to cope with a unique circumstance. Once we acclimate to and master new tools, they are here to stay. 2020 marks such a turning point.

The foundations for this round of exponential acceleration were laid before the pandemic. Our ever-expanding base of computing capacity delivered globally through powerful, ubiquitous, and inexpensive communications networks created the opportunity for rapid advancement across the technology industry(as you will see through this report). While applications were being adopted and proving significant pre-COVID-19, this crisis catalyzed and accelerated this next era. The innovations from this crisis will have lasting positive impacts for the entire world.

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# Market Map of Sector Deep-Dives

## Online grocery delivery & logistics



## Car-generated data



## B2B payments



## Cybersecurity



## Automated contract analytics



## Remote healthcare testing

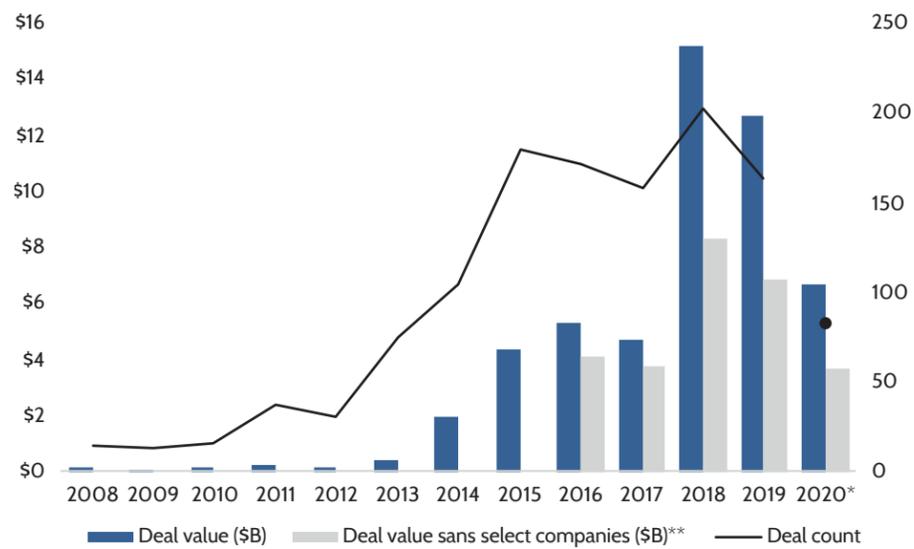


## Biotechnology



# Online grocery delivery & logistics

## VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

\*\*Excluded companies: Grab, Gojek, Manbang Group, Ele.me, Rappi, and Keking

Kicked off in earnest by Amazon's acquisition of Whole Foods Market and bolstered by the success of online providers such as Instacart and Doordash, the e-commerce revolution has begun to penetrate the grocery industry. Although brick-and-mortar sales still account for the majority of grocery sales, the entry of these strong e-commerce players has forced traditional retailers to evolve in order to maintain market share in the competitive grocery space. While online sales still accounted for only 3%-4% of the US market in 2019, McKinsey estimates that share will exceed 10% by 2025.<sup>1</sup> The unprecedented impact of the COVID-19 pandemic has possibly provided a glimpse into the future, with online sales penetration expected to surpass the previous estimates for 2020. A survey

published by Deutsche Bank Research's US Retail team revealed that 45% of people purchased groceries online from April 2019-April 2020, compared to 28% from September 2018-September 2019.<sup>2</sup> While many shoppers may return to their pre-pandemic habits, the secular tailwinds and long-term shifts to the industry will likely remain.

**Growing e-commerce penetration has online sales of food & beverage poised to top \$40.0 billion in the US by 2022.<sup>3</sup>**

## Key takeaways

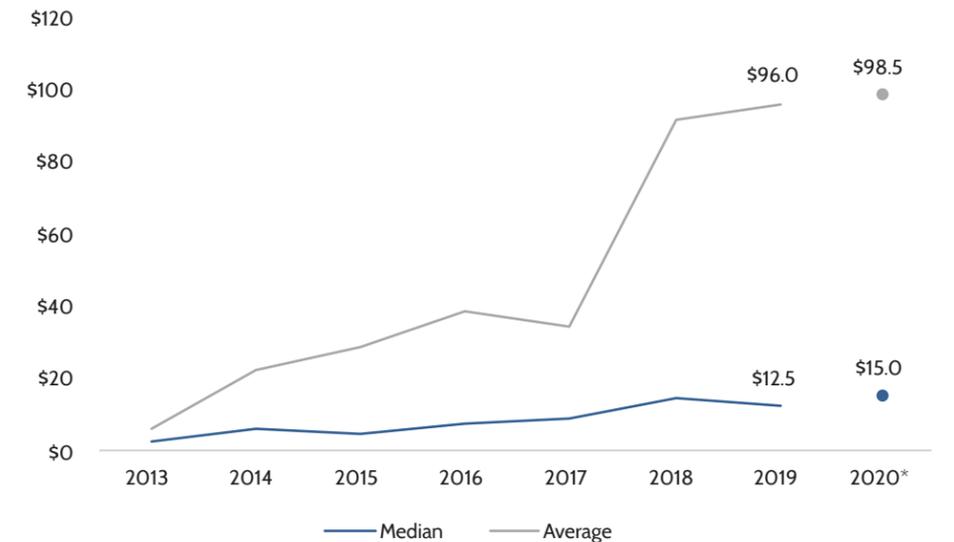
- COVID-19 has generated an unprecedented increase in demand for online grocery shopping.
- While brick-and-mortar grocery shopping will remain the norm for the foreseeable future, omnichannel offerings will become requisites for grocery providers, who will need more efficient fulfillment solutions due to margin pressure.
- Micro-fulfillment centers, a new type of urban tech-enabled distribution center, have emerged as the preferred solution, stemming principally from implementation costs, savings on labor and last-mile delivery.
- Full-stack solutions (for example, providing logistics as a service and/or fully operational micro-fulfillment centers) will appeal to the broadest range of potential retailers, grocers, and medium-large enterprise customers.

## ONLINE GROCERY DELIVERY & LOGISTICS

However, the pivot to online grocery presents challenges for retailers, primarily in the form of increased supply chain complexity, shipping volume, and higher costs in an extremely margin-sensitive industry. Online delivery often results in losses, with sales oriented toward customer retention over profits. To tackle these challenges, retailers will need to modernize their supply chains by utilizing robotics, automation, and improved software to manage higher volumes of online orders. To date, retailers have typically built costly, automated, large-scale centralized fulfillment centers outside urban areas that then transport goods to points of sale. However, advances in underlying technologies, such as robotics and AI, have empowered innovation in supply chains. The micro-fulfillment center (MFC) is rapidly emerging as the modern fulfillment method of choice. An MFC is a highly automated distribution center placed in the heart of a city that can be as small as 10,000 square feet (versus 600,000 square feet for traditional centralized distribution).<sup>4</sup>

MFCs are the preferred fulfillment model due to their faster deployment, lower initial and ongoing costs (for example, capital expenditure, reduced delivery cost, and ongoing manual labor), ability to leverage and enhance existing supply chains, and limited impact on in-store experience (versus high traffic caused by products being manually picked). As a result, MFCs have the potential to compare favorably against all fulfillment models from a profitability perspective for retailers (10%-15% EBITDA per order versus 5% for in-store purchases and negative margins for other delivery models).<sup>5</sup> In an industry with consistently slim margins, the potential for margin accretion has attracted attention, with essentially all major players interested in deployment of supply chain tech and efficiency-generating fulfillment models.

## Median and average VC deal sizes (\$M)



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

**Tailwinds from the rapid adoption of online grocery delivery in the wake of COVID-19 should lift the segment far past the \$100 billion estimated for the industry's growth over the next five years.<sup>6</sup>**

Drivers of innovation in this space include more sophisticated inventory management software to meet changes to demand from e-commerce, next-gen robotics capable of picking 1,000 items in an hour, and ridesharing models' penetration into last-mile delivery. Although many regional networks already have extant fulfillment centers, the appealing margins of MFCs may lead to a greater proliferation, particularly in competitive geographies and across different scales and product offerings. Higher-end grocery and retail chains may be able to strike a balance between the upfront costs of MFCs and aggressive expansion into less-served regions.

**\$15.0M**

Record median VC round size through the first eight months of 2020

1: "Digital Disruption at the Grocery Store," McKinsey, February 14, 2020.  
2: "Life After Covid-19," Deutsche Bank Research, September 29, 2020.  
3: "US Food & Beverage Ecommerce Sales 2019-2023," eMarketer, March 1, 2019.

4: "Grocery Delivery Goes Small With Micro-Fulfillment Centers," The Wall Street Journal, January 27, 2020.  
5: "Fulfillment Deep Dive: MFCs = Best Path to Profitability; WMT Top Grocery Play," Jefferies Equity Research, Food Retail & Distribution, October 10, 2019.  
6: "The Food Industry Association," Nielsen, September 17, 2020.

Specialty goods stores could do the same. In the meantime, large regional chains could diversify their fulfillment networks and start improving margins across the board. Ultimately, this could lead to a broader base of customers for MFC product and service providers.

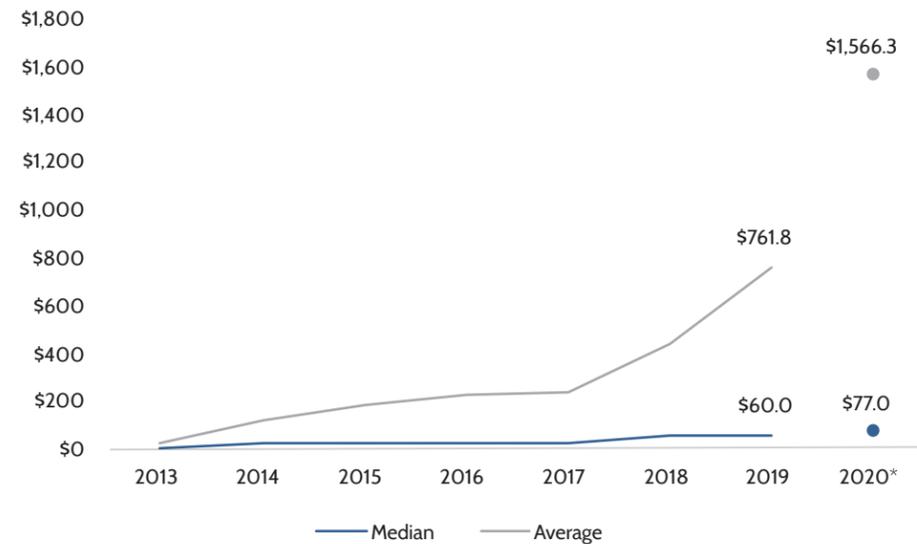
### Financing trends

Through mid-August 2020, capital invested into the online grocery space has already outstripped every year before 2018, when deal value peaked at \$15.2 billion. This lofty funding figure signals that market leaders in last-mile delivery—which are primarily ridesharing platforms expanding into grocery delivery rather than companies focused on last-mile delivery—are using multiple rounds of funding to outspend their competitors.

To more clearly analyze the broader online grocery delivery & logistics ecosystem, this report compares total deal value with and without the 10 largest deals closed by major ridesharing companies. Even without those outsized rounds, the industry still closed on \$6.9 billion in 2019 and \$3.7 billion thus far in 2020. That maturation and saturation of the last-mile delivery market will help lower the cost of grocery delivery and likely open new areas of opportunity, which helps explain the more robust funding trends in the ridesharing datasets. Companies offering supporting technologies, such as MFCs, will continue luring more capital and may even find attractive exit opportunities, even as mature markets garner less interest.

As certain segments mature and leaders emerge in new markets, investors are concentrating larger infusions of capital across a smaller number of deals. This is evident in late-stage financing sizes, which have risen for years. The average has spiked, while the median peaked at \$35.3 million in 2019, subsiding slightly to \$26.2 million through mid-

### Median and average pre-money VC valuations (\$M)



Source: PitchBook | Geography: Global  
\*As of August 17, 2020  
Note: Low sample size, n = 26.

**52% of US consumers have shopped for groceries online recently due to the pandemic, according to an April 2020 survey conducted by Fabric. 20% of these customers are doing so for the first time.<sup>7</sup>**

August 2020. Pre-money valuations have also risen, especially the average, emphasizing the same trend.

Online grocery delivery is still an emerging segment, as illustrated by limited portfolio company exits despite large capital inflows. However, exit volume indicates strong momentum in the space, and as winners begin to gain share in the newly developed areas of the market, companies in the arena will continue to seek access to public markets or be attractive acquisition targets for major retailers (such as Walmart, Amazon, and so on). As a result, the supporting ecosystem of MFCs will become even more critical to enabling their expansion.

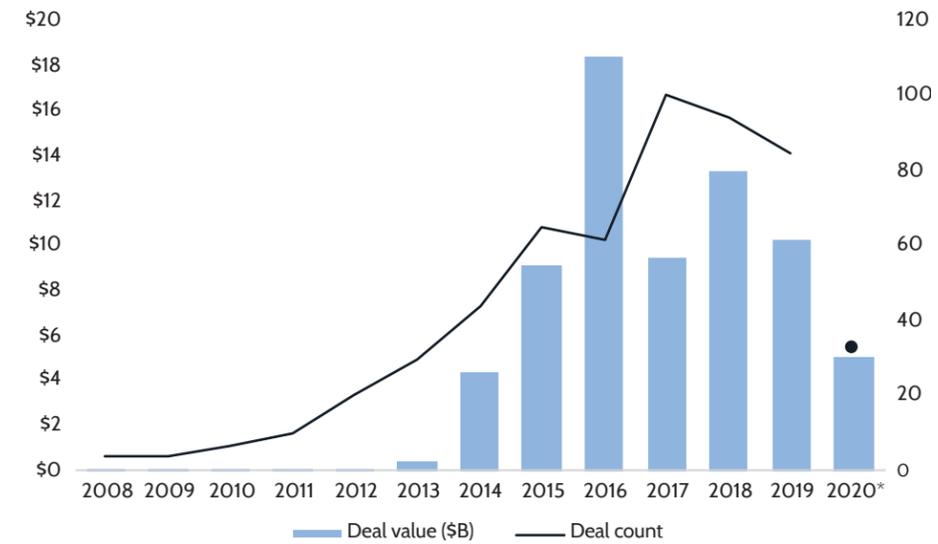


# 58.2%

**CAGR of aggregate VC deal value from 2010 to 2019 on a 26.2% CAGR in the number of funding rounds**

# Car-generated data

### VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

The rise of the connected and digitally enhanced vehicle has created an entirely unique computing environment that generates tremendous amounts of data. The increased application of data to traditional industries and the maturation of new technology companies have generated numerous current applications. Early use cases were primarily focused on supporting existing applications or other emerging technologies such as autonomous vehicle development, mapping products, and insurance.

It is difficult to overstate the growth in data generated by the connected vehicle. A single vehicle could generate terabytes of raw data per hour, with this figure only growing as vehicles become more connected. Due to the sheer amounts of data being generated and growing capabilities in analytics suites, new end use cases have become apparent.

**The market for automotive software and for electrical and electronic components is projected to grow from \$238 billion to \$469 billion between 2020 and 2030, an anticipated 7% CAGR.<sup>8</sup>**

However, there are gaps between the generation, collection, storage, analysis, and subsequent transformation of this data into actionable insights. As access to processed data grows, startups will increasingly find opportunities for innovation, supporting extant technology players (such as automotive OEMs, ridesharing, and mapping

### Key takeaways

- Dashcams, sensors, and other hardware have transformed vehicles into a novel computing environment, generating new and valuable data.
- The increases in data generation and the surge in automotive software capabilities are creating a massive market for car-generated data which innovative startups are beginning to harness to create new services and actionable insights for mature players.
- Segments across the entire chain of data generation to analysis will provide niche services, end-to-end solutions, or a variety in between.
- Incumbency challenges from major automotive OEMs and established technology leaders create an elevated competitive landscape but also a deep pool of potential customers, partners, and acquirers.

7: "The Impact of COVID-19 on Online Grocery" Fabric, April 2020.

8: "Monetizing Car Data: New Service Business Opportunities to Create New Customer Benefits." McKinsey & Company, Advanced Industries, September 2016.

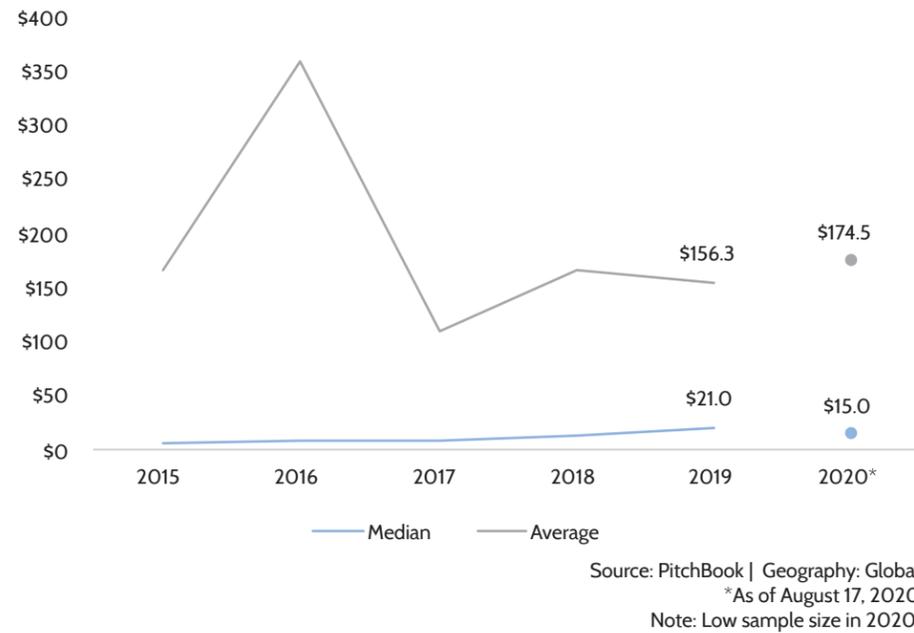
companies) or developing entirely novel opportunities. In the same way that processing and analyzing raw data from the internet has spawned entire new categories, the growth and refinement of real-world vehicle-generated data present the potential to create myriad novel high-value end applications in the near, medium and long term. Incumbents will pose challenges to startups in this new ecosystem but could also become potential partners or acquirers.

### Financing trends

The regulatory and technical challenges implied by these developments, along with incumbent automakers rapidly trying to develop or scale such capabilities, have contributed to the trends observed in venture financing across the past several years. Global deal volume in the car-generated data space peaked at 100 rounds in 2017 and has since slid slowly, with a drop in 2020 exacerbated by the COVID-19 pandemic. However, cyclical factors were also likely at play in the first half of 2020, with incumbent carmakers scaling capabilities across their own vehicles and current ridesharing leaders reaching maturity. While these factors have reduced funding in existing technologies, they also create the foundation for new categories. Venture-backed startups may feed into the mature customer base of incumbents by focusing on distinct segments and then licensing or selling technical services, data, analytics or plug-in solutions to companies willing to pay up.

Deal sizes across the industry have steadily trended larger over recent years. The median financing size crested at \$21.0 million in 2019, falling to \$15.0 million in 2020 through mid-August. Averages for both financing sizes and pre-money valuations are substantially skewed, given the presence of category leaders such as Waymo and Grab.

### Median and average VC deal sizes (\$M)



### The market for car-generated data, by McKinsey's estimate, might reach \$450 billion to \$750 billion by 2030.<sup>9</sup>

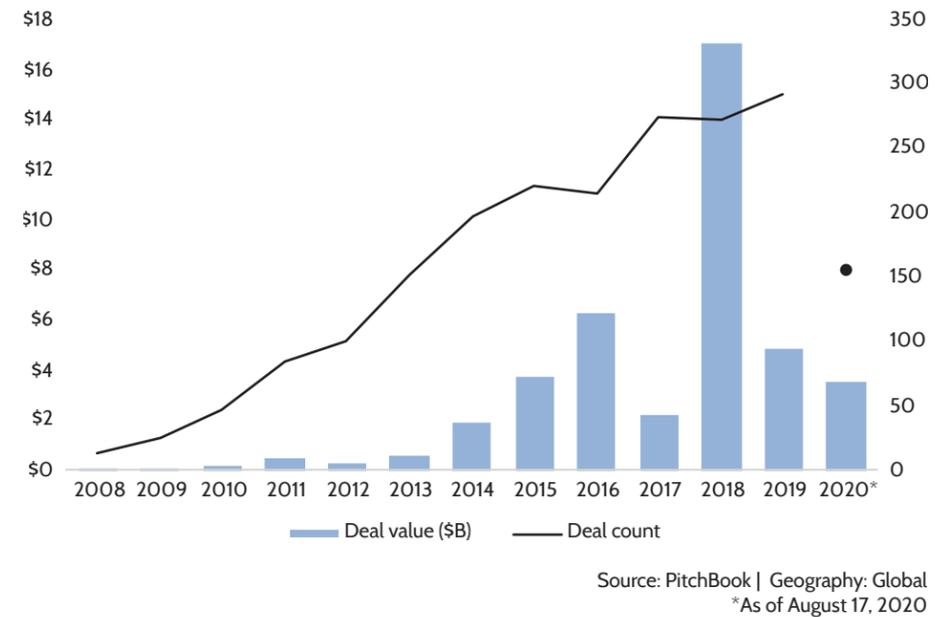
The market maturity in certain segments creates significant acquisition potential for car-generated data startups at the start of the funnel. For example, in the US, Uber and Lyft have the potential to utilize sizable amounts of data to license to carmakers and contribute valuable information flows to operators within the space of car-generated data. Of the 10 largest exits for this segment globally, eight were mergers or acquisitions, with Lyft's and Uber's IPOs representing the other two. Consolidation appears to have had a significant impact so far, but it remains to be seen if it will further drive unification of offerings across regional jurisdictions.

## 80.8%

CAGR of aggregate VC deal value in the car-generated data industry over the past decade across a 28.4% CAGR in financing volume

# B2B payments

### VC deal activity



To date, innovation in the payments sector has primarily targeted the consumer, with technologies such as cashless payments or contactless points-of-sale (POS) systems through PayPal, Venmo and Square. With that said, the opportunity in business-to-business (B2B) payments is actually considerably larger, with an annual total payments volume (TPV) of \$25 trillion in the US, as opposed to only \$400 billion in peer-to-peer (P2P) TPV. The B2B category can be broken into key segments, including enterprise, cross-border and small- to medium-sized business (SMB) payments. While the enterprise payments space has seen varying degrees of innovation and investor focus, cross-border and SMB payments have received less attention due to the perceived fragmentation of the market and the complex nature of these customers and transactions. Given

the limited penetration and adoption of technology in the B2B payments sector, paper checks, automated clearing house (ACH) payments, and bank wires currently account for 95% of TPV (47%, 34%, and 15%, respectively).<sup>11</sup> In the last 50 years, payments have, for the most part, not changed, particularly for SMBs. But as these businesses represent the fastest-growing areas of the B2B payments market, SMBs have quite recently begun to see increased focus and innovation driven by new go-to-market strategies and business model innovations.

Global B2B payments volume is expected to reach \$218 trillion by 2022.<sup>10</sup>

### Key takeaways

- The number of B2B payments providers has exploded in response to buyer and seller pain points with specialized products and services aimed at reducing transaction costs, processing time, transparency, and more.
- While the economic impacts of the COVID-19 pandemic have resulted in a reduction in business activity, market trends toward digital payments in the underpenetrated B2B space are irreversible.
- Secular drivers of innovation in this space include advances in AI & ML that have automated many back-office processes and increased demand for greater transaction speed and transparency.
- Key differentiators in the space include ease of use, adaptability of solutions, and ability to handle security and regulatory challenges.

9: "Mapping the Automotive Software-and-Electronics Landscape Through 2030", McKinsey & Company, Automotive & Assembly, July 9, 2019.

10: "Global B2B Transactions Approach \$218T Value, Research Finds", PYMNTS, March 27, 2018.

11: "Paper Checks Still Dominate B2B Payments", Payments Journal, June 7, 2019.

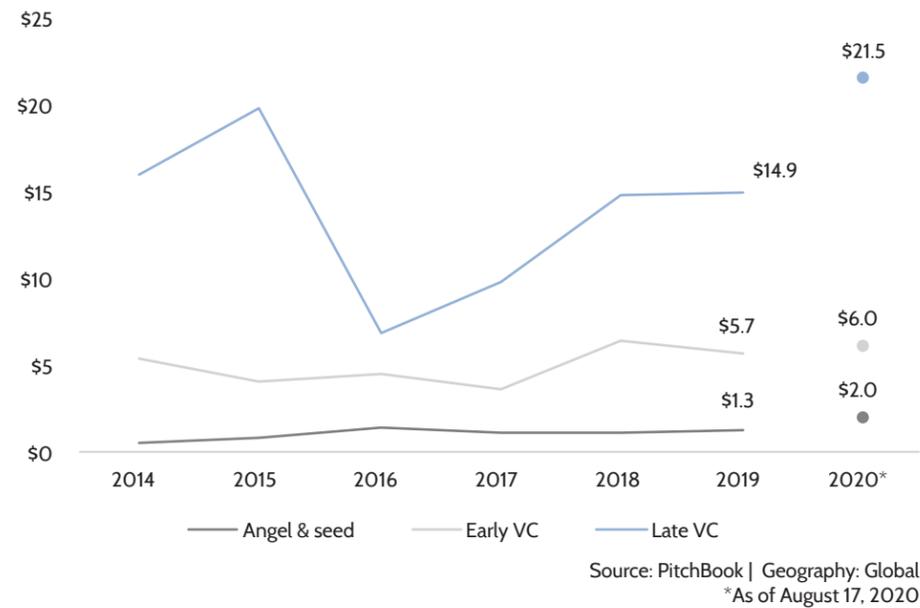
As business owners begin to realize the potential for faster digital payments to benefit their cash flow, the lifeblood of an SMB's daily operations, they will increasingly adopt new technology for payments innovation.

In order to see widespread adoption, B2B payments need to fit seamlessly into existing workflows. Key areas to accelerate solution adoption, particularly for SMBs, revolve around their ease of use. Business owners generally lack the time to focus on complicated new systems. Some are creatures of habit that reluctantly deviate from legacy methods. Thus, for adoption to scale, solutions need to have extremely simple user experiences that are able to work with all the business' counterparties via unilateral payments, even if the recipient is not using the same platform or network. They need to operate as simply as consumer payments applications such as Venmo. Given the prevalence of legacy payment methods, hybrid models that incorporate checks, ACH, and wire payments may provide a natural bridge to assist with broader adoption. In addition, payment platforms will have a requirement to integrate with other SMB back-office systems for bookkeeping such QuickBooks and Excel, because users often cite the lack of connectivity to incumbent record systems as the primary pain point with new tools.

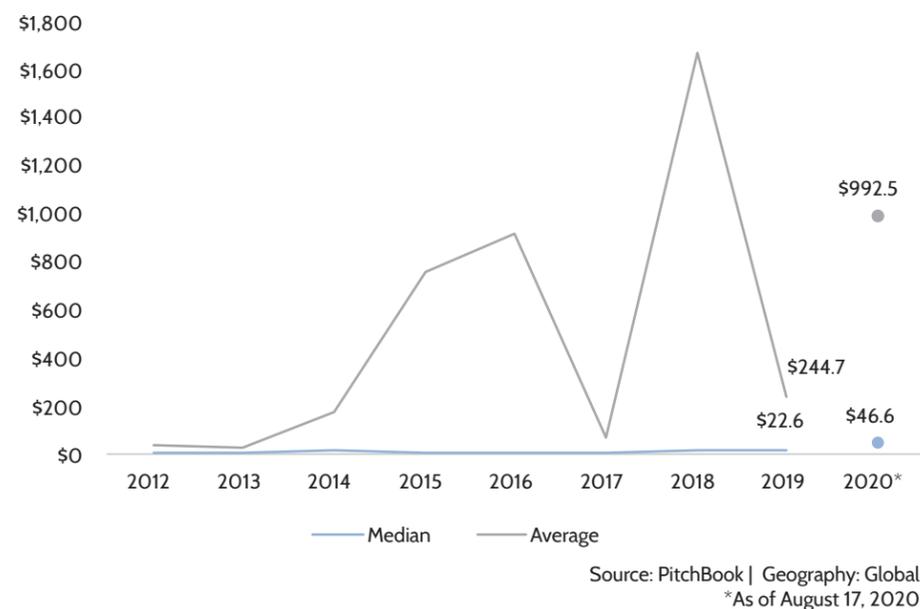
Transaction processing costs, Deloitte has found, can cost up to \$8 per single supplier.<sup>12</sup>



### Median VC deal size (\$M) by stage



### Average & median pre-money VC valuation (\$M)



SMBs have varying billings cycles, payment frequencies and other more industry-driven payment specifications and intricacies. However, the common denominator for all SMBs is a hyper-focus on cash flows and price sensitivity, given their margins and competitive moats do not necessarily afford significant flexibility across balance sheets. Accordingly, SMBs prize greater transparency, visibility, and speed as primary value-adds when it comes to payment solutions. As payments platforms typically generate revenue through charges on very small percentages of TPV, achieving category leadership and scale are particularly important in the space due to the ability to drive material revenue while maintaining a lighter transaction cost burden on end customers. As such, industry pressures will result in category leaders with massive scale and valuations.

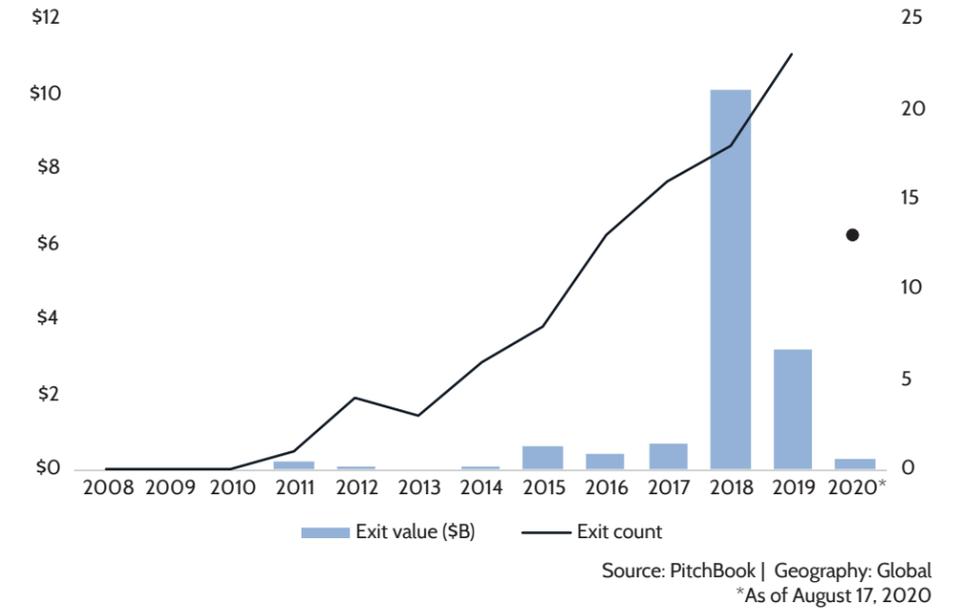
### Financing trends

Venture activity in the B2B payments space has grown substantially if not exponentially over the past decade. A record 292 transactions closed in 2019 for a total of \$17.1 billion, propelled by multibillion-dollar financings in the Asia-Pacific region.

A gradual, if choppy, rise in the median late-stage venture financing size over the past five years illustrates steady concentration of capital and consolidation between emerging category leaders. Emerging category leaders will likely grow even more, with



### VC exit activity



potential exits on the horizon. The rise in exits across the space has been steep, but massive deals are fewer and farther between, with Adyen, Bill.com, and iZettle standing out as multibillion-dollar liquidity events. These transactions highlight the potential for massive exits within the space, which, coupled with the technical advances that enable even greater tools to be offered for B2B solutions, should continue to encourage heavy inflows of funding.



3.8x

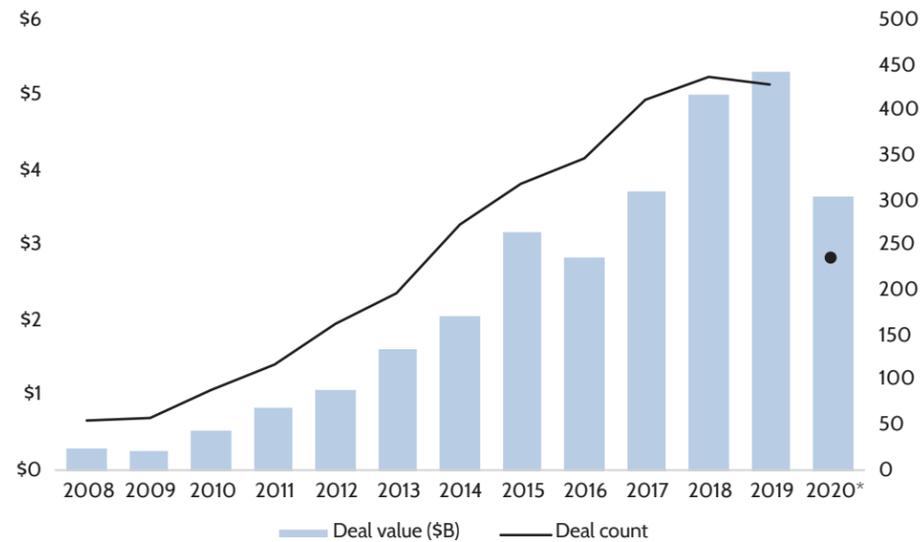
Follow-on rounds exceeded first financings by a factor of nearly 4x in 2019, signifying concentrated capital

12: "B2B Payments for the Middle Market," Deloitte | Financial Services, September 18, 2020.

# Cybersecurity



## VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

The world is entering a new era of pervasive cybersecurity threats, with the FBI reporting that 2019 recorded the highest number of internet-related complaints and dollar losses from cyberattacks in history.<sup>13</sup> Additionally, an increase in phishing scams and videoconferencing hacks have forced enterprises to confront the challenges of securing a distributed workforce. Beyond classic network security, the blend of personal and professional devices, which necessitates clearer education for users around security best practices, poses a novel twist on traditional cybersecurity challenges.

Although the bulk of breaches still occur via more routine means of phishing or password leaks, innovation within the space occurs at unparalleled speed on both the criminal and the white-hat

**The information security and risk management market spend for 2020 is estimated to be \$123.8 billion, a more than 35x increase from \$3.5 billion in spend in 2004.<sup>14</sup>**

sides, prompting significant spend. This leads to many opportunities for new products and services to come to market. For example, the incidence of attacks at the provider level, particularly in cloud storage and managed service providers, presents a broadening trend that could catalyze some intriguing innovation prospects.

### Key takeaways

- Threat sophistication has increased in line with the considerable expansion of attack surfaces over the past decade, a trend correlated with the advent of mobile technology, cloud computing, and the IoT.
- COVID-19 has forced many employees into distributed working environments, presenting novel challenges to email, data security, and access management.
- Secular drivers of innovation in this space include the role of AI & ML in automating threat detection as enterprises stay on top of the alerts generated by the uptick in the utilization of security tools.
- Exits have been strong, highlighting the evergreen appeal of lucrative sales to giant enterprise companies and robust welcomes to IPOs by public markets.

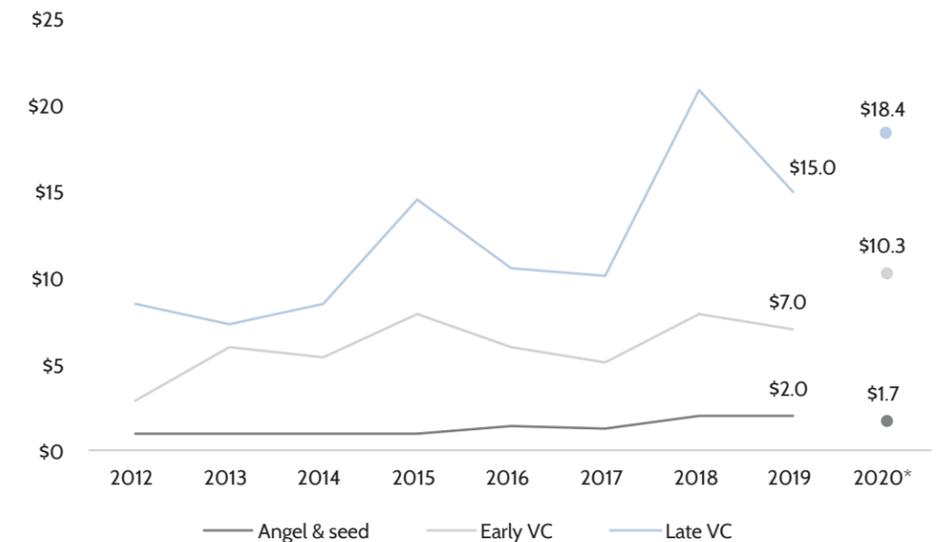
## CYBERSECURITY

Sector growth is accelerating, with estimated enterprise security spend expected to double by 2023 to nearly \$250 billion.<sup>15</sup>

The enterprise security landscape has rapidly evolved from a few protectable points (such as HQ, office, and server) to a massive network of access points (such as remote workers, mobile devices, cloud deployments and partner applications), a trend that has only been accelerated by the COVID-19 pandemic. Previously, enterprise networks and devices were primarily secured with antivirus programs and firewalls, but now that model is obsolete. The proliferation of access points (estimated at 31 billion connected devices in 2020<sup>16</sup>) has made data security and monitoring exponentially more difficult and caused enterprises to be increasingly vulnerable to data breaches due to the limitless number of vulnerable endpoints.

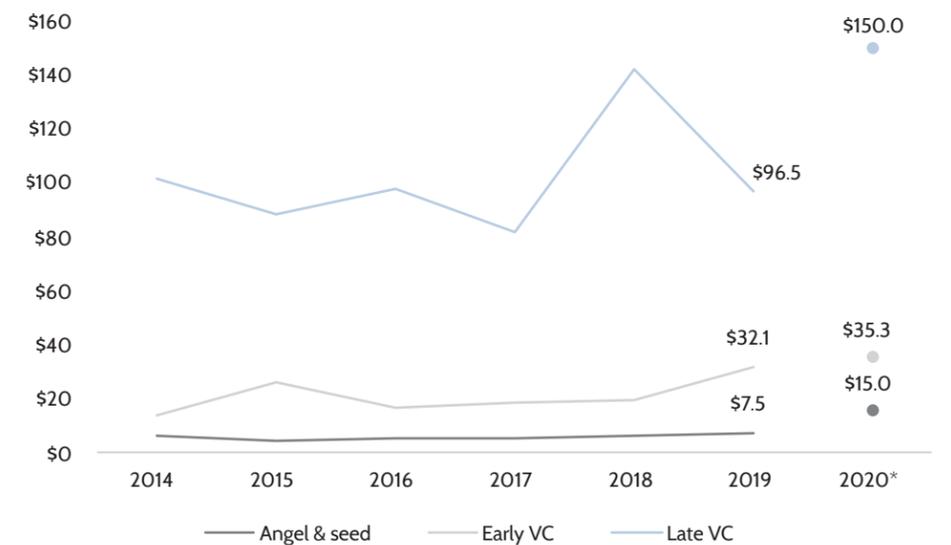
Currently, traditional enterprise data security relies on numerous silos of expensive point-solutions. While a mix of point solutions such as firewalls and antivirus software could previously provide adequate security, the expansion of the space has necessitated the next generation of cybersecurity platforms. Vendors that can provide full-stack enterprise security with proactive rather than reactive features, such as access management for data privacy, AI-based threat monitoring, and endpoint protection, will have broader market appeal. In particular, access and identity management is likeliest to be a key

## Median VC deal size (\$M) by stage



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

## Median VC pre-money valuation (\$M) by stage



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

Note: 2020 angel & seed value has a low sample size, n = 13.

13: "2019 Internet Crime Report Released: Data Reflects an Evolving Threat and the Importance of Reporting," Federal Bureau of Investigations, February 11, 2020.

14: "Gartner Forecasts Worldwide Security and Risk Management Spending Growth to Slow but Remain Positive in 2020", Gartner, June 17, 2020.

15: "Cybersecurity Market by Solution (IAM, Encryption, UTM, Antivirus/Antimalware, Firewall, IDS/IPS, Disaster Recovery, and DDOS Mitigation), Service, Security Type, Deployment Mode, Organization Size, Industry Vertical, and Region - Global Forecast to 2023," MarketsandMarkets, September 18, 2020.

16: "The IoT Rundown For 2020: Stats, Risks, and Solutions", Security Today, January 13, 2020

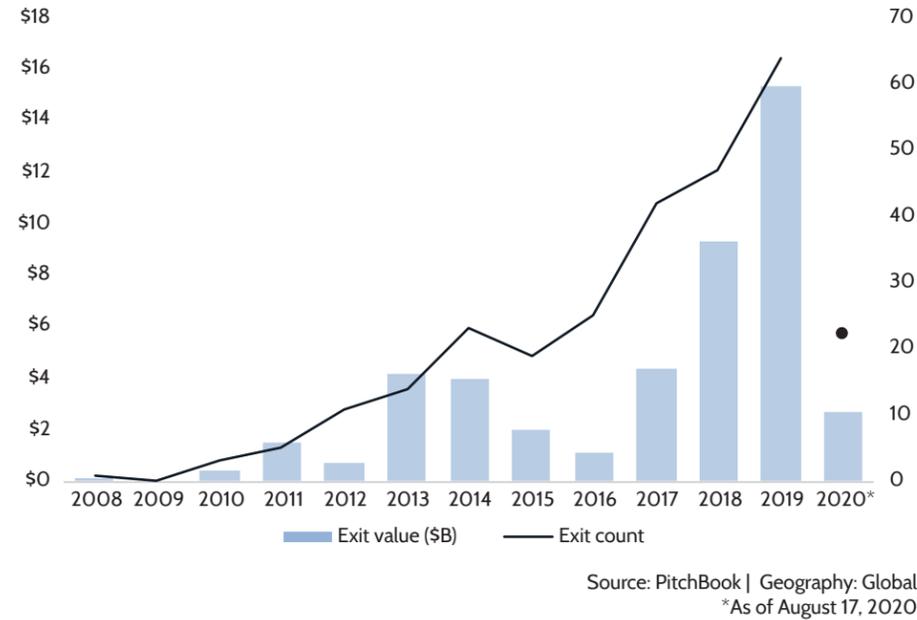
area because focusing on managing the originating identity is logistically and technically more feasible than securing every single device or access point. Grand View Research expects the global identity and access management market size to reach \$24.1 billion in size by 2025, according to a 2019 report.<sup>17</sup>

With 80% of data breaches having a connection to compromised privileged credentials,<sup>18</sup> next-generation privileged access management has become the top priority for chief information security officers at large enterprises.<sup>19</sup>

### Financing trends

In recent years, funding across the cybersecurity space has shifted up the startup lifecycle from the early stage to expansion, fueled by follow-on rounds from some of the top firms in VC. For example, the largest deal for the past decade came in 2020: a \$340 million Series G at a \$2.5 billion pre-money valuation for cloud security platform Netskope that included Dell Technologies Capital, Lightspeed Venture Partners, Sequoia Capital, and Accel—the most active investor in the cybersecurity space. The top five investors in the space, including Kleiner Perkins and Andreessen Horowitz, have completed a combined 239 funding rounds since the start of 2010.

### VC exit activity



Increasing median financing sizes over recent years have come alongside elevated quarterly deal activity throughout 2020 after both the overall volume and aggregate value of VC investments picked up in mid-2018. That activity has translated into a combined \$14.0 billion committed across 1,102 rounds in just 2.5 years—or nearly half of all VC invested into cybersecurity since the start of 2006 on roughly a third of all deals closed.

This lofty deal activity in 2020 year-to-date, comfortably surpassing the annual average of \$2.1 billion across some 215 rounds, has minted its fair share of unicorns along the way, as valuations have also soared. Global median pre-money valuations climbed by 17.6% from \$18.7 million in 2018 to \$22.0 million in 2019. The median size of early-stage VC deals registered the strongest pickup in that time, jumping by \$12.1 million to \$32.1 million in 2019, even as mature companies win greater market share. Indeed, Series A rounds represented a combined \$1.6 billion from 2018 to 2019; this pace has

hardly faltered in 2020, as Series A rounds have already generated \$582.3 million in aggregate funding across just 45 deals.

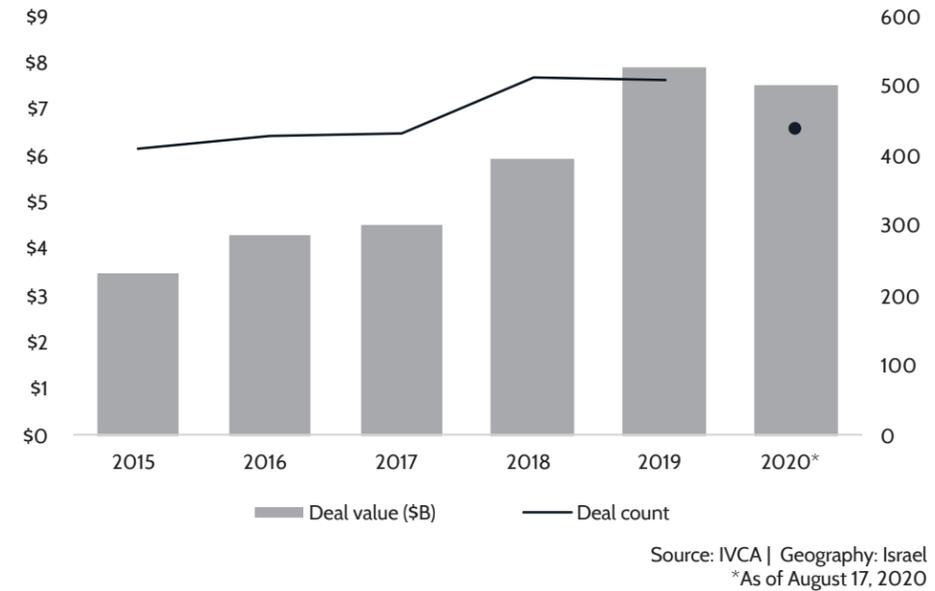
Despite the recent record-setting volumes, IPO and M&A markets for more mature vendors remain as favorable as ever. In 2019, a record 64 exits generated \$15.4 billion in aggregate value as the median VC-backed IPO more than doubled in three years to \$2.2 billion in 2019. A pair of standouts to debut in recent years, CrowdStrike and Cloudflare, illustrate the public market's collective appetite for vendors boasting comprehensive cloud-based security solutions, with both companies outperforming broader market indices so far in 2020. In general, cybersecurity stocks are trading at highs; Okta, CrowdStrike, Cloudflare, Palo Alto Networks, and Zscaler are all notching either new all-time highs or matching prior peaks. With strong secular tailwinds, exit volume and velocity in the space is expected to continue for the foreseeable future.



# Spotlight: Israel



### VC deal activity



The Israeli startup and VC ecosystem has expanded rapidly over the past decade, benefiting from an array of key drivers. Chief among these has been the hallmark of any rapidly developing tech ecosystem: the recycling of capital, both human and financial, by those that succeed first within the space. In addition, the backdrop of favorable fiscal and political support by government agencies about fostering innovation and entrepreneurship, particularly in technology potentially valuable from a military standpoint, aids in both developing talent and supporting nascent enterprises. PitchBook has published rankings that indicate that, after the US, Israeli universities produce a significantly larger number of founders that then go on to attract considerable sums of capital than any other country. The most recent rankings have Tel Aviv University as having produced 807 founders that went on to raise over \$16 billion, for example, while Technion – Israel Institute of Technology had just over 600 founders start more than 500 companies that have since raised \$12.4 billion.

A lesser-known yet hardly less crucial contributing factor in the growth of the Israeli ecosystem has been the ongoing expansion of major multinational companies into Israel, with the likes of Microsoft, Intel, and Salesforce acquiring domestic businesses and establishing R&D centers. For example, the US-Israel Binational Research & Development Foundation is currently aiming for an additional \$50 million funding boost over the next five years.<sup>20</sup>

Last, but not least, and even of historic import has been the recent closing of the Abraham Accords. This agreement, finalized in September 2020, saw the United Arab Emirates, Bahrain, and Israel meet to normalize diplomatic relations and establish closer affiliation across economic and political spheres. Although nothing is certain, this agreement could set the stage for significant flows of capital and talent across the entire Middle East, gradually widening markets and the venture ecosystem.

### Key takeaways

- Israel's venture ecosystem has developed significantly over the past decade, with considerable developments across key technology arenas.
- Key contributing drivers of this expansion include significant reinvestment and recycling of capital and talent, sustained government backing of entrepreneurship and technology critical to national security, and strengthening bonds with international hubs of capital and talent (for example, Silicon Valley and London).
- 514 financings in 2018 retains the high-water mark for funding volume of the decade, although the resilience in 2020 to date in terms of volume stands out, with 438 transactions closed by the end of the third quarter.
- In 2019 and 2020 to date, over \$2 billion has been invested across the segments in this report. The vast bulk of capital has flowed to B2B payments and car-generated data.

17: "Identity And Access Management Market Worth \$24.12 Billion By 2025", Grand View Research, June 2019.

18: "The Forrester Wave™: Privileged Identity Management, Q4 2018", Forrester, November 14, 2018

19: "CISOs Should Focus on These 10 Security Projects to Reduce Risk and Make a Large Impact on the Business.", Gartner, June 6, 2018

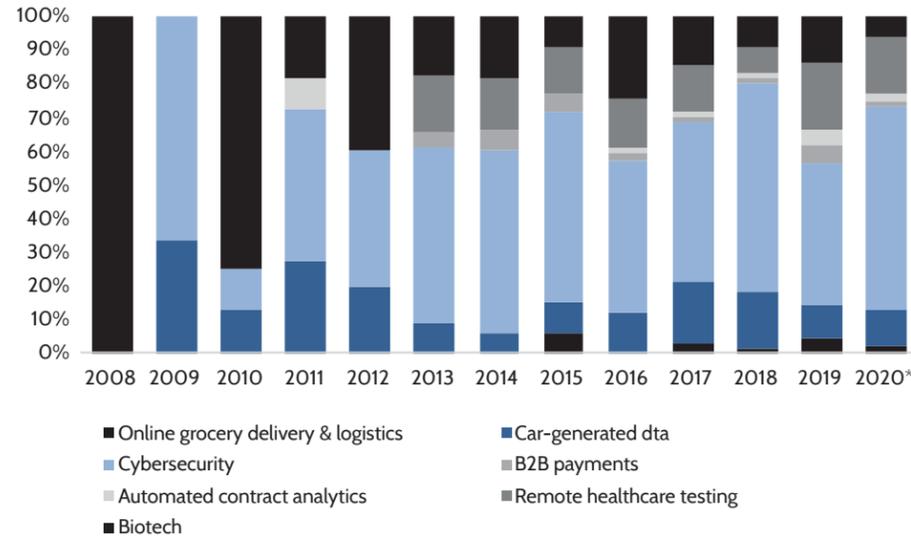
20: "US-Israel binational R&D fund seeks to increase funding for strategic edge", The Times of Israel, October 4, 2020.

## Financing trends

Israel's ecosystem experienced a massive boom throughout the 2010s. 2019 saw a peak of \$7.9 billion in VC invested across 508 transactions, the former figure a record and the latter on par with the 514 financings closed in 2018. Although the COVID-19 pandemic likely contributed to a slowdown in the pace of dealmaking, 2020 through Q3 had already seen \$7.5 billion invested across 438 deals.<sup>21</sup> Robust exits fuel continued liquidity that often cycles back into the domestic ecosystem; select examples include the \$7.1 billion acquisition of semiconductor-based connectivity products maker Mellanox by Nvidia in April 2020 and the \$900 million purchase of transit application developer Moovit in May 2020.

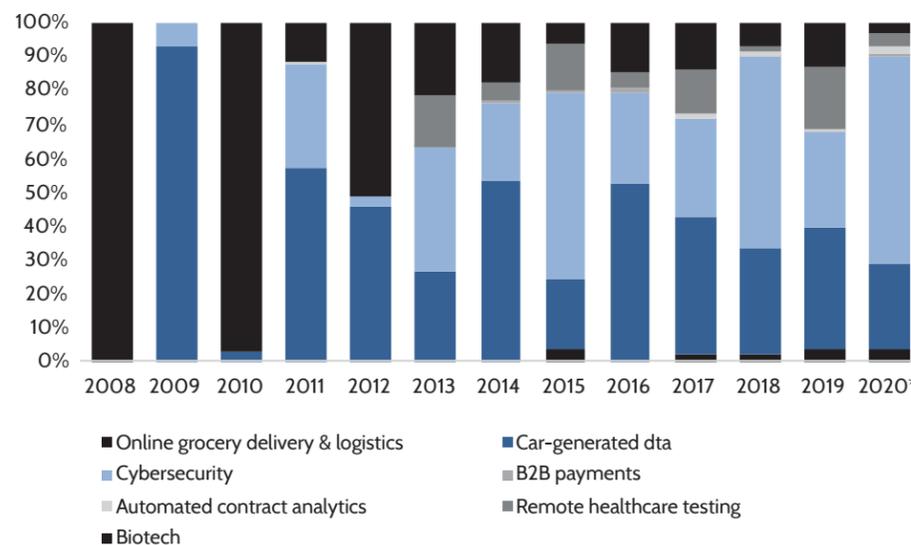
Focusing on the key segments covered within the scope of this report, similarly strong figures occurred. 76 deals closed in 2018, 71 in 2019, and 48 through mid-August 2020, with a total of \$2.7 billion invested during that timeframe. Key sectors of strength for the Israeli venture ecosystem serve as the bedrock for segments such as cybersecurity, car-generated data, and B2B payments, given Israel's robust track record in developing mobility and cybersecurity technology. Those segments have seen category leaders swiftly emerge, and even achieve significant exits such as Argus Cyber Security's \$420 million purchase by Continental in late 2017 and numerous fintech unicorns such as Tipalti, FundBox, Payoneer, Riskified, and Rapyd. As these spaces also see more liquidity, further development by serial founders will likely continue or expand into other, related spaces. Car-generated data and B2B payments will likely experience burgeoning growth thanks to the global dynamics identified earlier in this report.

## VC deals (#) by segment



Source: PitchBook | Geography: Israel  
\*As of August 17, 2020

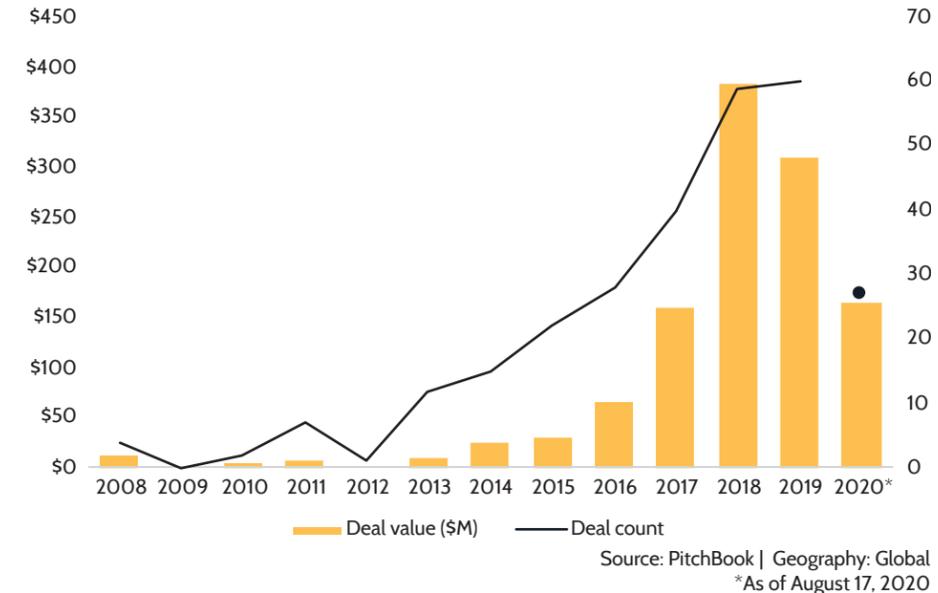
## VC deals (\$) by segment



Source: PitchBook | Geography: Israel  
\*As of August 17, 2020

# Automated contract analytics

## VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

The global legal services market is anticipated to exceed a trillion dollars in size by 2025.<sup>22</sup> Given its complexity and the high cost of inaccuracy, the legal services market remains almost entirely people driven, devoid of major innovations. Legaltech has the potential to be a major disruptor in this massive market by allowing corporations to reduce their legal spend on low-value manual tasks previously performed by high-cost legal professionals. As evidenced by developments in the DevOps market and other value-adds by increasingly proficient AI-driven solutions, professionals can be empowered significantly by automating more routine service functions. The rate of penetration is low; a Mitrtech survey indicated that although US law departments spend almost \$1.5 billion annually on legal software, no single type was used by more than 40% of potential buyers.<sup>23</sup>

**Legal services in the US comprise a \$437 billion market,<sup>24</sup> with US commercial enterprises spending ~\$220 billion per year on commercial legal services.<sup>25</sup>**

The primary focus in the space has been to complement humans, rather than fully replace lawyers. For the time being, this hybrid model of software with human quality assurance is required, and solutions primarily free up legal resources to some degree, reducing costs and accelerating legal processes. All the while, software leaders in the space are rapidly improving

## Key takeaways

- Legaltech platforms deploying AI & ML have become pervasive not only in discovery, but also in research, contract review & management, and litigation.
- Primary differentiators relate to levels of proficiency, namely in the realm of meaning inference and efficient bulk documentation analysis that allows for optimal prioritization of human time.
- Next-level analysis could disrupt the entire legal services market as technology solutions complement or replace legal professionals for basic legal services.
- The equilibrium between the need for human oversight and the deployment of increasingly sophisticated legal analytics software is still being established, with current offerings primarily aiming to free extant legal resources for higher-priority tasks.
- Venture firms are increasingly looking to fund legaltech businesses as their business models and solutions more closely resemble classic B2B verticalized enterprise software market.

21: All these figures are sourced from the PitchBook 2020 Israel Private Capital Breakdown.

22: "Global \$1+ Trillion Legal Services Market Outlook, 2019 to 2025 - Corporate Segment Expected to Emerge as the Fastest-Growing Segment Over the Forecast Period", Research And Markets, December 11, 2019.

23: "Catching the Wave: Legal Technology Spend at Least \$3 Billion and Growing", Mitrtech, September 30, 2020.

24: "The Size of the US Legal Market: Shrinking Piece of a Bigger pie - an LEI Graphic", Legal Executive Institute, January 11, 2016.

25: "How Big is the US Legal Services Market?", Thomson Reuters, 2016

their capabilities and expect to provide fully automated processing for basic contracts in the near future. In 2019, the legal analytics market was valued at \$740.1 million.<sup>26</sup> Legal research presents a somewhat different set of challenges than contract review as the potential of relevant information can be wider. Advances in natural language processing in contract review can also be applied to legal discovery to help resources find relevant information more quickly. The language complexity presents challenges for AI/ML solutions, thus the standardization across certain legal documents parameters that can be useful in helping define instructions for sets of AI tools. Granted, technical challenges remain, as linguistic nuances can be difficult to capture until more regimented and rigorous data is available for models to train on, but such development is only a matter of time.<sup>27</sup>

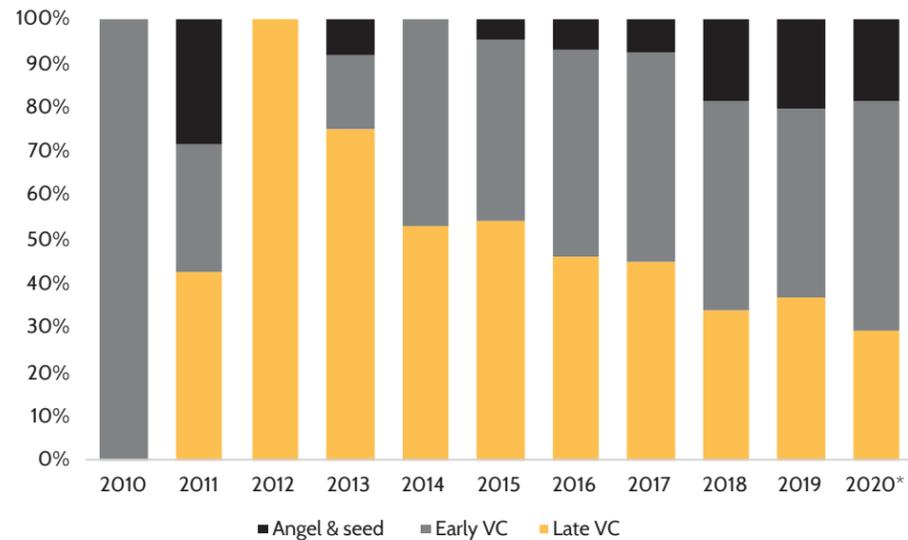
**With an estimated 98 million contracts executed in the US every year, the contract automation market represents an estimated \$10 billion market.**<sup>28</sup>

With regard to areas of focus, challenges differ. Legal research presents a somewhat different set of challenges than contract review as the potential of relevant information can be wider. Advances in natural language processing in contract review are increasingly applied to legal discovery to help resources find relevant information more quickly.

### Financing trends

Given its ripe opportunity but complex challenges, the legaltech space has not seen as much founder or investor

### VC deals (#) by stage



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

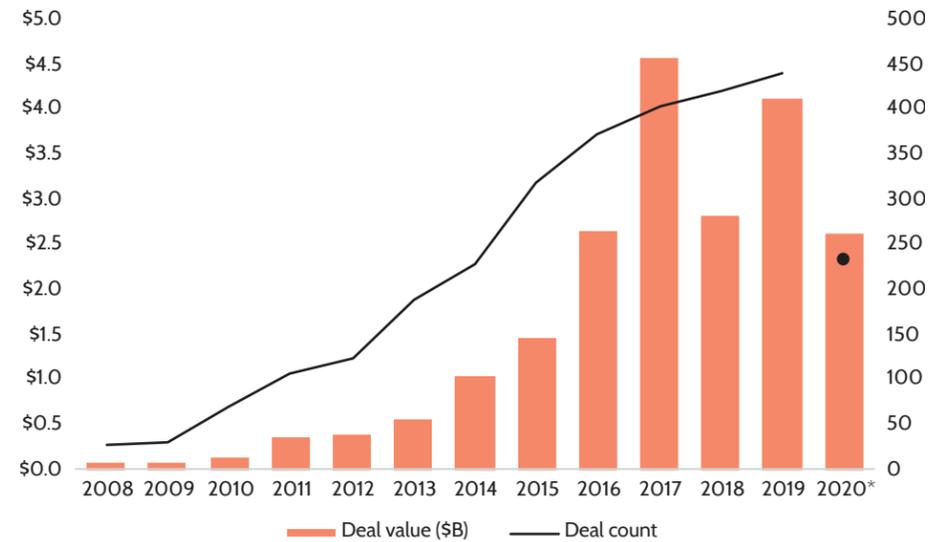
interest as other emerging tech industries examined in this report; however, activity has ramped up substantially over the past few years. 2018 and 2019 each saw a combined 119 financings for close to \$700 million in aggregate global VC invested.

Moreover, 2020 has seen 27 transactions for \$164.5 million by mid-August. Interestingly, financing has not been concentrated in a small number of large rounds, but rather a profusion of more modestly sized financings. This suggests that the category is ripe for an emerging company to capture category leadership for the space or within specific legaltech verticals. The ultimate winner will likely be determined by differentiated technical capabilities, integrability with existing back-office software, and marketing. It is likely that such a category leader will utilize a model similar to extant SaaS best practices given the recurring nature of demand and variety of end use cases needed. Due to the relatively young age of the automated contract analytics space, there have been limited exits within this segment. Some consolidation has

occurred, as is evident from reviewing the top exits within the space, such as LexisNexis purchasing Intelligize or ServiceNow buying FriendlyData. However, the maturation of this industry and increasing adoption along with the escalation in VC funding suggest that the space is emerging as an attractive enterprise software vertical. As has been seen in adjacent back office software verticals, the highly recurring revenue and attractive margin potential will likely make private equity investors active acquirers. Similarly, given the large market opportunity, as providers improve their offerings to tackle increasingly complex technical challenges and category leaders emerge, companies in the space will increasingly become attractive acquisition targets for established players. Such extant incumbents will likely continue expanding their product and talent pools via acquisitions and to achieve non-organic growth.

# Remote healthcare testing

### VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

The ability to provide quality healthcare and improved outcomes at an affordable cost is one of the keys to economic growth and vitality of economies worldwide. Digital health solutions that combine the power advances in medical devices and diagnostics, with advanced computing from software, AI, and ML developments, will be key drivers of opportunity in this space. Early-detection and preventative care are of particular interest to governments, insurers, and healthcare providers as they dramatically reduce long-term cost of care for preventable disease. Healthcare costs incurred by families covered by large employers have increased 67% over the last decade; average health costs paid on behalf of workers in the form of premium contributions for family coverage alone increased 51%.<sup>29</sup> Given the large costs to such providers, cost-reduction via early detection is of the highest priority to these providers, and startups that can establish first-mover advantages

and customer relationships with these entities will have the edge in achieving scale.

COVID-19's impact underscored the need for advances in and the proliferation of remote healthcare testing tools, and it has also prompted significant increases in demand and investment into the sector. The remote healthcare testing industry has traditionally been dominated by large medical device and pharmaceutical companies, but tech giants such as Google, Apple and Amazon have all shown increased interest in staking their claims in the industry, signaling the potential for both heightened competition and increased exit opportunities.

The proliferation of smartphones, with approximately 3.5 billion devices in usage as of 2020 and penetration rates increasing from 35% in 2011 to 81% and climbing in 2019 in the US alone,<sup>30</sup> have enabled tools that use the smartphone

### Key takeaways

- The COVID-19 pandemic has proved a significant accelerant of demand for, and focus on, remote healthcare testing.
- Empowering individual consumers to utilize widely available smartphone-based tools for healthcare assessment and testing can unlock unprecedented scale and accessibility.
- Given technical advances and reduction in costs of delivery of supplemental kits, the home care diagnostics market is growing rapidly.
- Venture investment continues to rise within the space given favorable macro trends and an increasingly promising exit environment.

**Healthcare costs within the US now represent 17.7% of GDP.<sup>31</sup> The global digital health market is set to reach \$509.2 billion by 2025, expanding at a CAGR of 27.7%.<sup>32</sup>**

26: "Legal Analytics Market is Thriving Worldwide 2020 | Trends, Growth and Profit Analysis, Forecast by 2027", Verified Market Research, September 8, 2020.  
27: "Global LegalTech Artificial Intelligence Market is Expected to Grow at a CAGR of More Than 37.7% Over the Forecast period Owing to Digitalization Trend in Traditional Law Practices and Practitioners, Says Absolute Markets Insights", Absolute Markets Insights, February 4, 2020.  
28: 98 million contracts at \$100 per contract.

29: "Healthcare Costs Increased Twice as Fast as Worker Wages Over Last Decade", AJMC, August 26, 2019.  
30: "Mobile Fact Sheet", Pew Research Center, June 12, 2019.  
31: "Health Care Costs Accounted for 17.7 Percent of GDP in 2018", California Health Care Foundation, June 2, 2020.  
32: "Digital Health Market Size Worth \$509.2 Billion By 2025", View Research, May 2019.

REMOTE HEALTHCARE TESTING

to become valuable as clinical devices. Steady advances of smartphone technology and supporting software capabilities have laid the foundation for major advances in potential healthcare use cases, especially healthcare testing.

The global home diagnostics space is anticipated to hit a market size of \$6.5 billion by 2025.<sup>33</sup>

Although high-quality imagery and sensors are not a panacea for obtaining useful data for clinicians, the smartphone's capabilities can be paired with AI to create highly accurate diagnostic tools. This coupling allows individuals to generate valuable information to pass onto their primary care providers from the comfort of their own homes. Significant growth is anticipated in the areas wherein frequent monitoring is required (for example, kidney disease, diabetes). Eliminating or reducing the need for high volumes of primary care visits is highly appealing for both healthcare providers and patients. Given the wealth of healthcare needs and data types, potential applications for both platforms and niche solutions are nearly boundless.

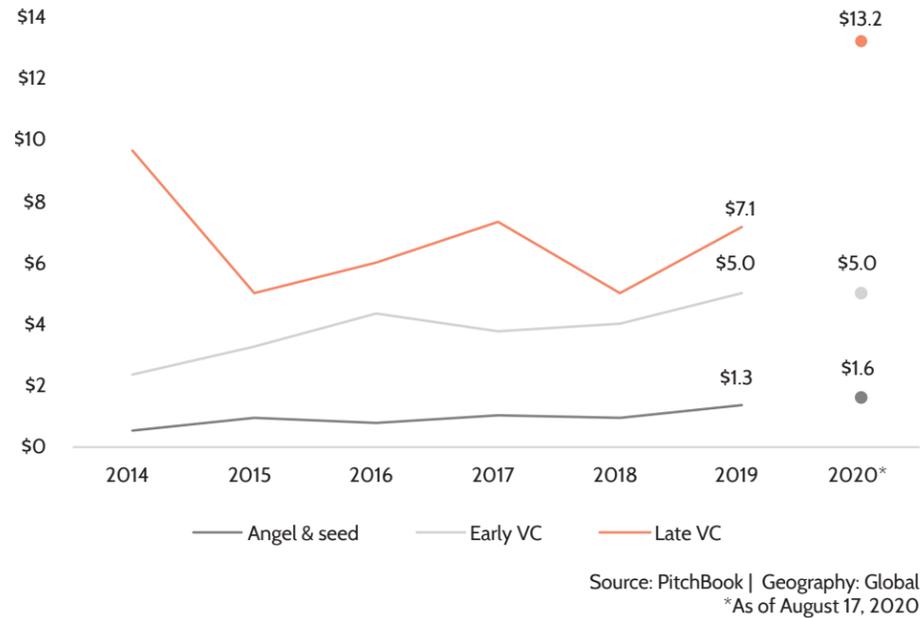


**30.5%**

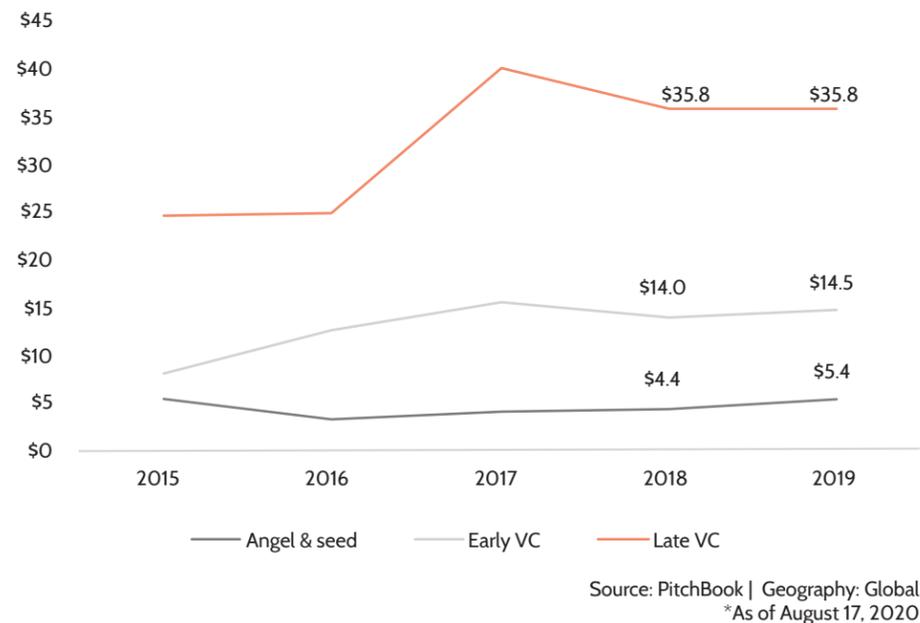
Venture invested has grown at a massive CAGR since 2010 through mid-August 2020



Median VC deal size (\$M) by stage



Median VC pre-money valuation (\$M) by stage



REMOTE HEALTHCARE TESTING



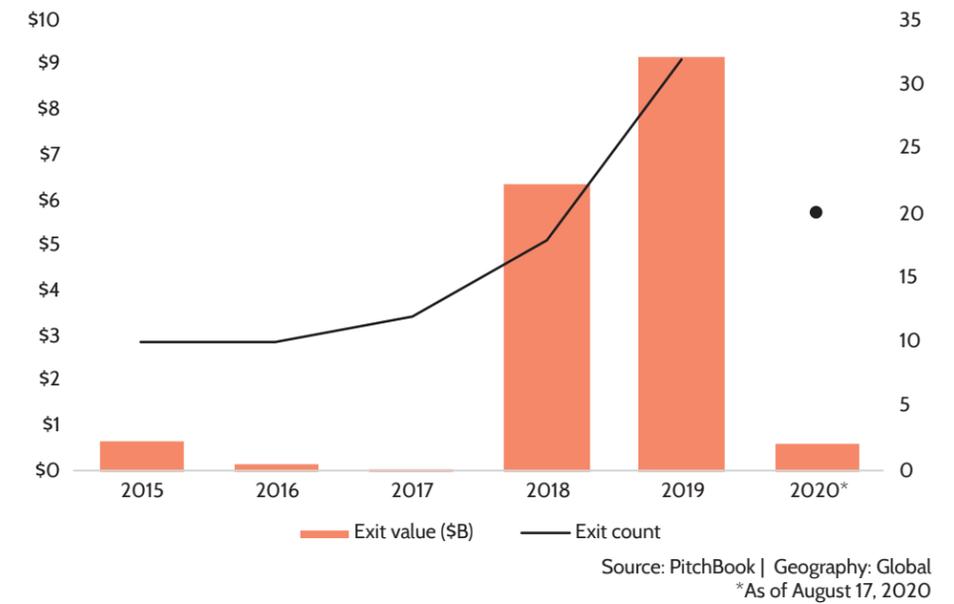
Financing trends

Since 2016, \$16.8 billion has been invested in the healthcare testing space. Moreover, shock events such the current pandemic have only accelerated these secular trends. At 232 completed funding rounds for an aggregate of \$2.6 billion through mid-August, 2020 has maintained the segment's high financing momentum. 2020 transactional volume has tilted toward larger rounds, which suggests that investors are still willing to fund more mature companies in this space, despite, or potentially, due to potential ramifications of the COVID-19 pandemic.

In recent years, remote healthcare testing has drawn significant amounts of funding and interest on the part of venture investors. Volume peaked at 440 transactions in 2019 across an accumulation of \$4.1 billion in VC invested. Although large financings helped propel earlier years to a higher tally—2017's \$4.6 billion currently retains the status as the lucrative year for the space—the overall trend has been toward significant growth in both volume and capital flowing into remote healthcare testing tools, mirroring the larger market tailwinds.

Company maturation over the years not only helps explain ongoing robust funding levels—for example, in 2020 already over 60% of VC invested has been in rounds of \$25 million or more in size, while more volume has occurred amid larger funding rounds at well over 10% of all 2020 volume—but also has contributed to an increasing number of liquidity events. 2019 saw a peak of 32 exits by venture-backed companies within the space, for a cumulative \$9.2

VC exit activity



billion in value. Moreover, 2020 has registered an additional 20 exits through late summer.

PitchBook estimates show exits in digital health already in the billions, at close to \$5 billion so far in 2020, so the broader space definitely bears out the potential for much larger exits going forward. Top exits within the remote healthcare testing space include Livongo's IPO in summer 2019 and Digital Pharmacist's acquisition in early 2019. Given the favorable macro trends defining this space and anticipated growth, a transition to more mature companies in the remote healthcare testing industry opting to go public or further consolidation and acquisition by larger incumbents is likely.



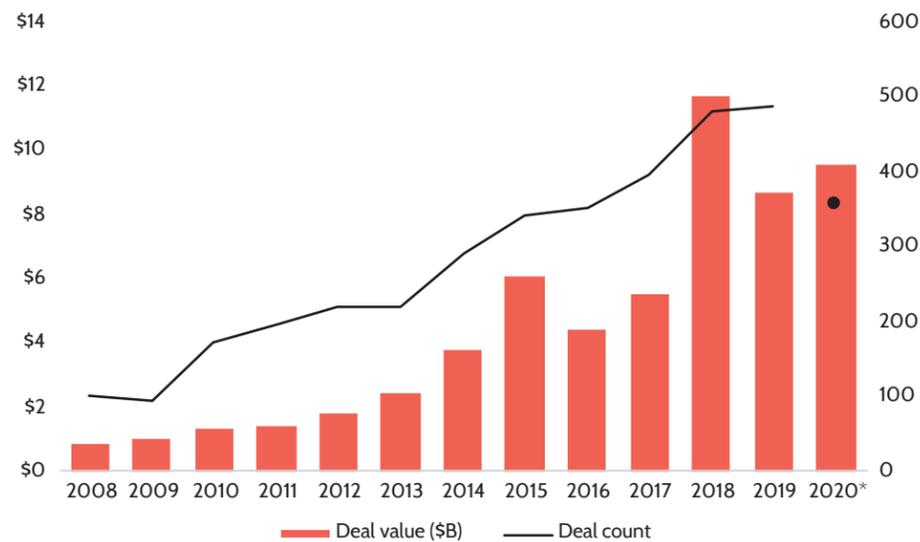
**\$87.6M**

At an all-time high, the surge in average pre-money valuations signals maturation amid a cohort of companies in the remote healthcare testing space.

33: "Global Home Diagnostics Market is Expected To Reach USD 6.53 Billion by 2025: Fior Markets", Fior Markets, August 28, 2019.

# Biotechnology

## VC deal activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

Biotech occupies a highly specialized space within the broader venture universe. However, the steady advances made in key non-healthcare technologies (such as computing) and scientific breakthroughs have laid the foundation for a potential surge of innovation and subsequent value creation. While the initial breakthroughs paved the way for the lesser-known but just as critical follow-on advances, building on these breakthroughs often generates the widest impact. For example, the human genome was first successfully sequenced in 2003 at a cost of \$2.7 billion, a monumental breakthrough that made worldwide news; incremental improvements in sequencing, while widely unheralded, brought the cost of sequencing to under \$1,000. When paired with improvements in supporting technologies, these slow but steady advances have made commercially viable drug discovery based on human genetics (rather than mice or other animals) a reality.

Vaccines have not traditionally been a focus area for venture firms or startups relative to other segments due to the unit economics, development cycles, and levels of secular and regulatory competition. However, adjacent areas or relevant treatments that could be exacerbated by COVID-19 have been explored by both entrepreneurs and VCs in the past, particularly in the realm of immunotherapies. It is unlikely that due to the COVID-19 pandemic alone there will be a concerted, longer-lasting advance into vaccine development by startups, but increased attention and funding of related areas, such as platforms for treatment of neglected diseases with known cures but lack of efficient application or distribution, is probable. More interesting is the possibility for regulatory innovation, meaning if the acceleration of COVID-19 vaccine timelines do not impede the development of a successful treatment, regulatory bodies may reassess current schema, as they already began hesitantly doing in the 2010s.

## Key takeaways

- Driven by aging populations and higher incidences of chronic diseases, overall innovation in biotechnology remains a pressing need.
- Technological progress (for example, computing power, information storage, and so on) have dramatically reduced the cost of innovation while accelerating follow-on advances.
- The need for biotechnical innovation in agriculture and the broader environment will become imperative as climates change.
- Venture investment focus in biotech will likely diversify beyond current key areas into broader biotech applications.

According to a market report from Grand View Research, the global biotech market is expected to reach close to \$730 billion in size by 2025.<sup>35</sup>

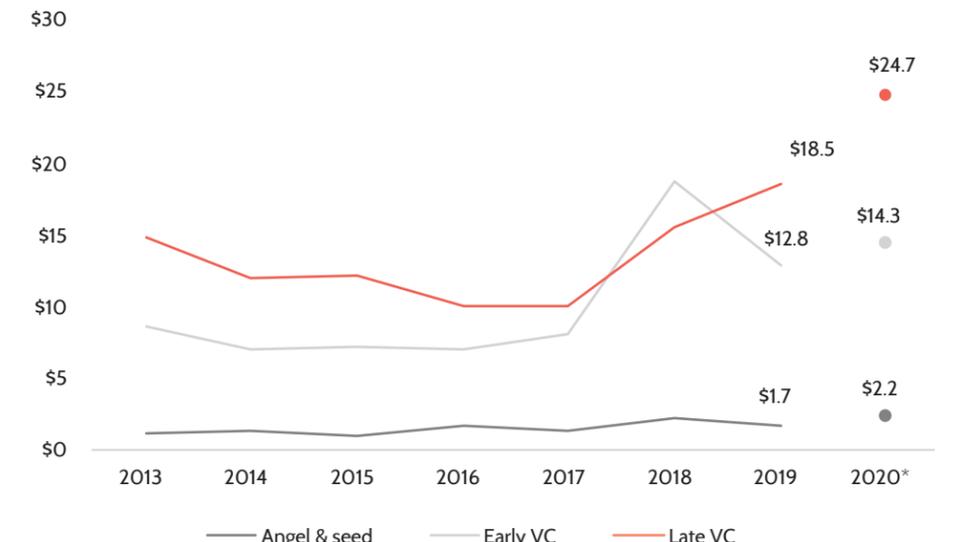
**BDO analysis released in September 2020 estimates that R&D spending in the life sciences industry surged 22% from 2018 to 2019, even as revenues increased just slightly.<sup>34</sup>**

In addition to the scientific and technological advances that propel this industry, global macro-tailwinds are driving increased focus on the space from governments, healthcare providers, and investors. As developed nations face the demands of aging populations and higher incidence of chronic and novel diseases, the biotech startup ecosystem has flourished to meet the challenge. While drug discovery will remain a measured process, novel drug therapies are being developed at record paces for both blockbuster drugs for and rare/orphan diseases. As these drugs progress through the approval process, promising drugs will undoubtedly attract acquirers or allow companies to target IPOs.

## Financing trends

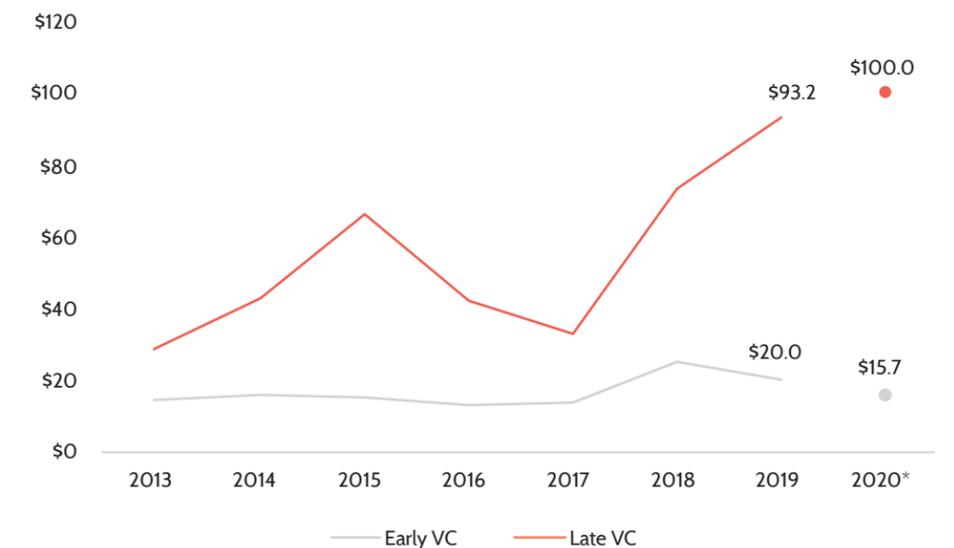
Significant investment has flowed to both drug development companies and platforms that seek to enable the delivery of medicines with more precision; this capital has come through the traditional venture channels or even the public listing of pre-clinical drug companies. Given the staggering variety of clinical needs across healthcare, even greater investment into the sector is likely. Chronic diseases, cancers, and pain treatments have drawn some of the largest funding and will likely remain the top draws given their large markets and massive potential.

## Median VC deal size (\$M) by stage



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

## Median VC pre-money valuation (\$M) by stage



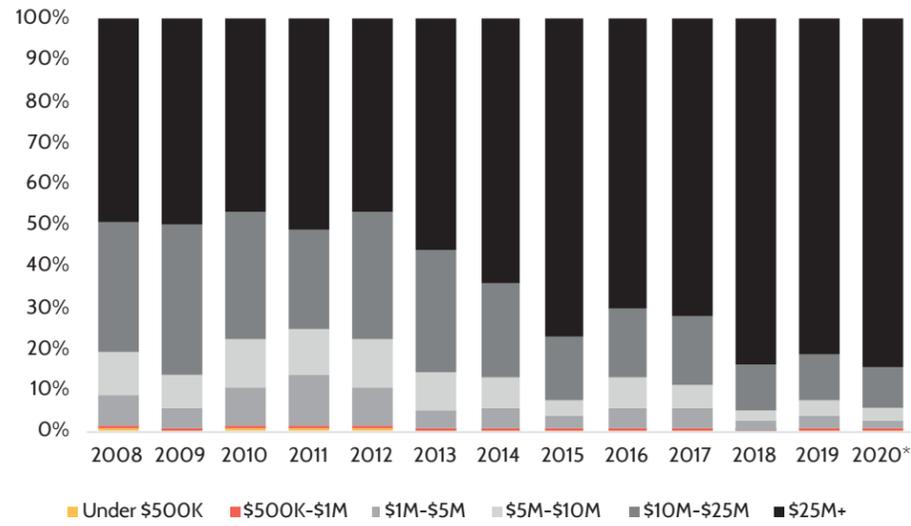
Source: PitchBook | Geography: Global  
\*As of August 17, 2020  
Note: 2020 late-stage value has a low sample size, n = 13.

34: "R&D Spend Surges 22% in Biotech Industry - BDO Study", BDO USA, LLP, September 2, 2020.

35: "Biotechnology Market Size Worth \$727.1 Billion By 2025", Grand View Research, August 2017.

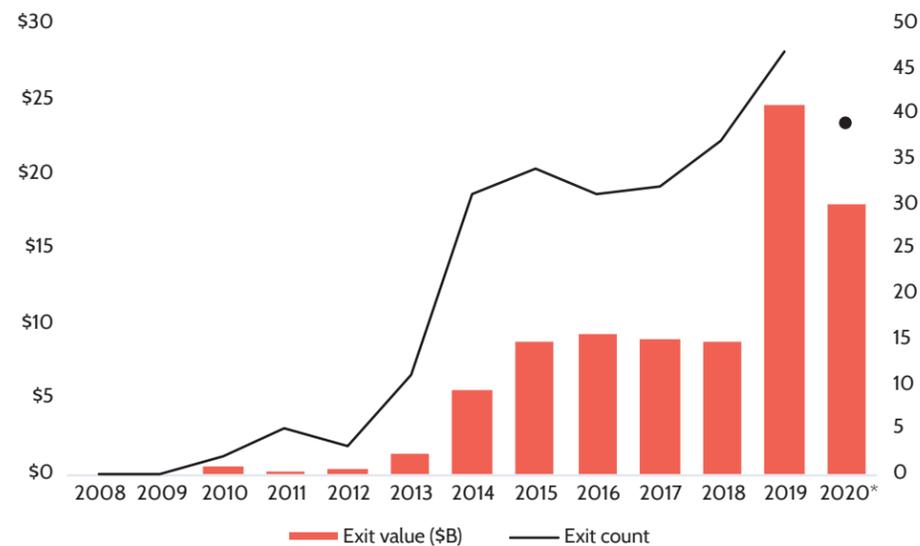
2019 saw no less than \$24.7 billion in exit value achieved across a record 47 liquidity events, and 2020 has already recorded close to \$18 billion through mid-August. IPOs propel a good portion of exits in the space, but the numerous multibillion-dollar transactions over the past few years illustrate the lucrative nature of biotech M&A as an exit route for investors and founders. The high volume of M&A is only expected to continue going forward, as Big Pharma players typically acquire drugs rather than developing them in-house.

### VC deals (#) by size



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

### VC exit activity



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

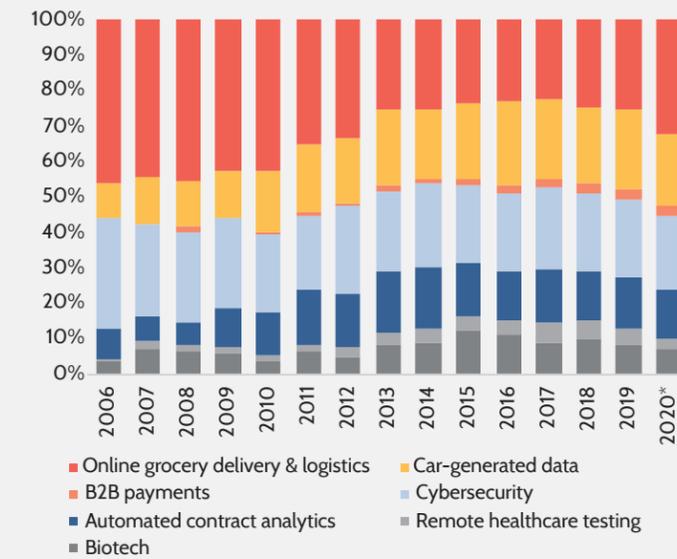


19.5%

CAGR for VC invested across the biotech segment has surged significantly since 2010 through mid-August 2020

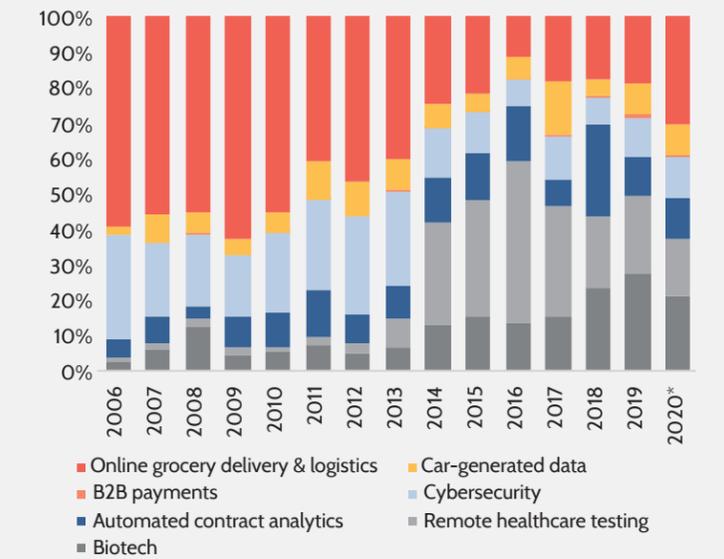
# Conclusion

### VC deals (#) by segment



Source: PitchBook | Geography: Global  
\*As of August 17, 2020

### VC deals (\$) by segment



Source: PitchBook | Geography: Global  
\*As of August 17, 2020



\$31.4B

An aggregate of VC invested across the seven primary segments through mid-August 2020



9.6%

CAGR in funding volume across all segments combined over the last decade



31.8%

Biotech's relative financing volume surges in 2020 amid mild slowdown

# Portfolio spotlights



**About:** Full-service robotics-based solution for urban microfulfillment centers

**Sector:** Online grocery & logistics

[getfabric.com](http://getfabric.com), [info@getfabric.com](mailto:info@getfabric.com)



**About:** AI cloud-connected cameras indexing the visual world

**Sector:** Car-generated data

[getnexar.com](http://getnexar.com),  
[contact@getnexar.com](mailto:contact@getnexar.com)



**About:** B2B payments platform for small businesses

**Sector:** B2B payments

[meliopayments.com](http://meliopayments.com)  
[info@meliopayments.com](mailto:info@meliopayments.com)



**About:** Cybersecurity for today's borderless enterprise

**Sector:** Cybersecurity

[prismosystems.com](http://prismosystems.com)  
[info@prismosystems.com](mailto:info@prismosystems.com)



**About:** Data analytics and machine learning engine designed to analyze legal documents

**Sector:** Automated contract analytics

[lawgeex.com](http://lawgeex.com), [hello@lawgeex.com](mailto:hello@lawgeex.com)



**About:** Medical selfies for home medical testing to solve provider and patient inefficiencies

**Sector:** Remote healthcare testing

[healthy.io](http://healthy.io), [support@healthy.io](mailto:support@healthy.io)



**About:** Precision health platform powered by AI and IoT technologies

**Sector:** Remote healthcare testing

[twinhealth.com](http://twinhealth.com)  
[ask@twinhealth.com](mailto:ask@twinhealth.com)



**About:** Small-molecule oncology therapeutic platform

**Sector:** Biotechnology



**About:** New nanoparticle for drug delivery including crossing the blood-brain barrier

**Sector:** Biotechnology

[dantari.com](http://dantari.com), [info@dantari.com](mailto:info@dantari.com)



**About:** Developing novel therapies to address the global pain epidemic

**Sector:** Biotechnology

## About Corner Ventures

Corner Ventures' goal is to invest in the next generation of iconic technology companies. Since our founding in 2004 as DAG Ventures, we've partnered with top-tier early-stage venture firms and the leading entrepreneurs to create exceptional outcomes. In 2018, DAG Ventures was rebranded Corner Ventures by its founders as the firm's next chapter.

Today, Corner Ventures continues to build upon its legacy as a trusted partner and resource to founders, investors, and world-class innovators by providing unique insights and strategic growth capital, as well as access to global investors and commercial networks. The fund is headquartered in Palo Alto, California, with investment and business development offices in Tel Aviv, New York and Tokyo.