Technology Landscape Macrotrends

Industry Response to Market Turmoil

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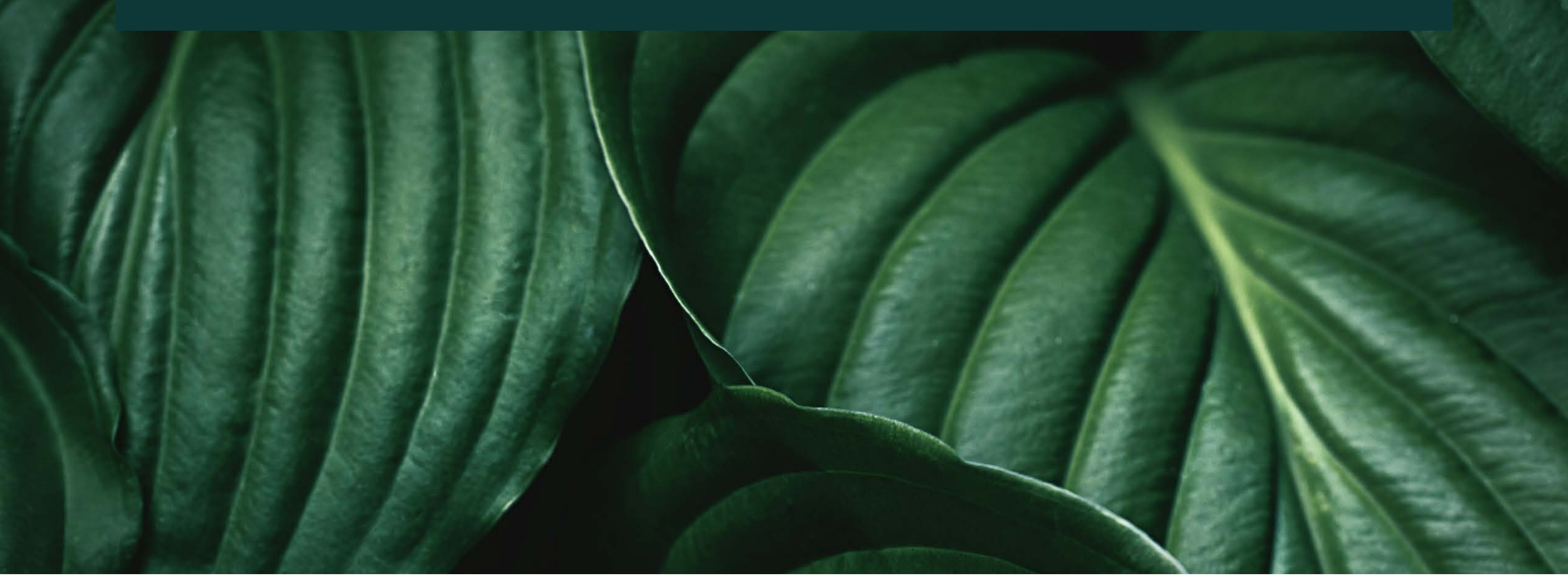

SECTION ONE

Introduction

Markets are in turmoil due in part to broader economic and geopolitical pressures, with some of the hottest technology stocks from 2021 seeing significant declines. Stock indices overall continue to experience significant volatility.

Dealmaking reached record highs in the 2010s; the volume hasn't abated by midyear 2022, but faces some headwinds. The technology dealmaking landscape is adapting to effects across venture capital (VC), private equity (PE), and strategic M&A, and in the field of technology innovation. Despite the various potential barriers, there continues to be strong interest in the long-term value proposition of the technology sector.

Artificial intelligence (AI) and machine learning (ML) show signs of affecting multiple industries as technology continues to transform industries and nations. In the United States, geopolitical tensions are leading to governmental support for expanded technology production.

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SECTION TWO

Executive Summary

Throughout the 2010s and into the early 2020s, dealmaking across both private and public markets in technology rose to a crescendo, reaching record levels of both deal value and volume in 2021.

Underpinned by unprecedented growth rates in adoption and market penetration by multiple enterprise software categories, some of those record levels even persist into mid-2022, although significant macroeconomic and geopolitical challenges take their toll.

The metrics for 2021's heights are staggering: US technology venture capital activity surged to nearly $300 billion across just under 14,500 completed transactions; private equity fund managers closed 2,592 deals for an aggregate of $453.2 billion; and M&A in the space eclipsed 5,000 completed deals for an immense $940 billion.

The rate of decline varied across markets, but at minimum, the volume of M&A, PE, and VC deals closed slowed, although outlier transactions and dry powder levels, in some cases, helped elevate aggregate deal values and financing metrics.

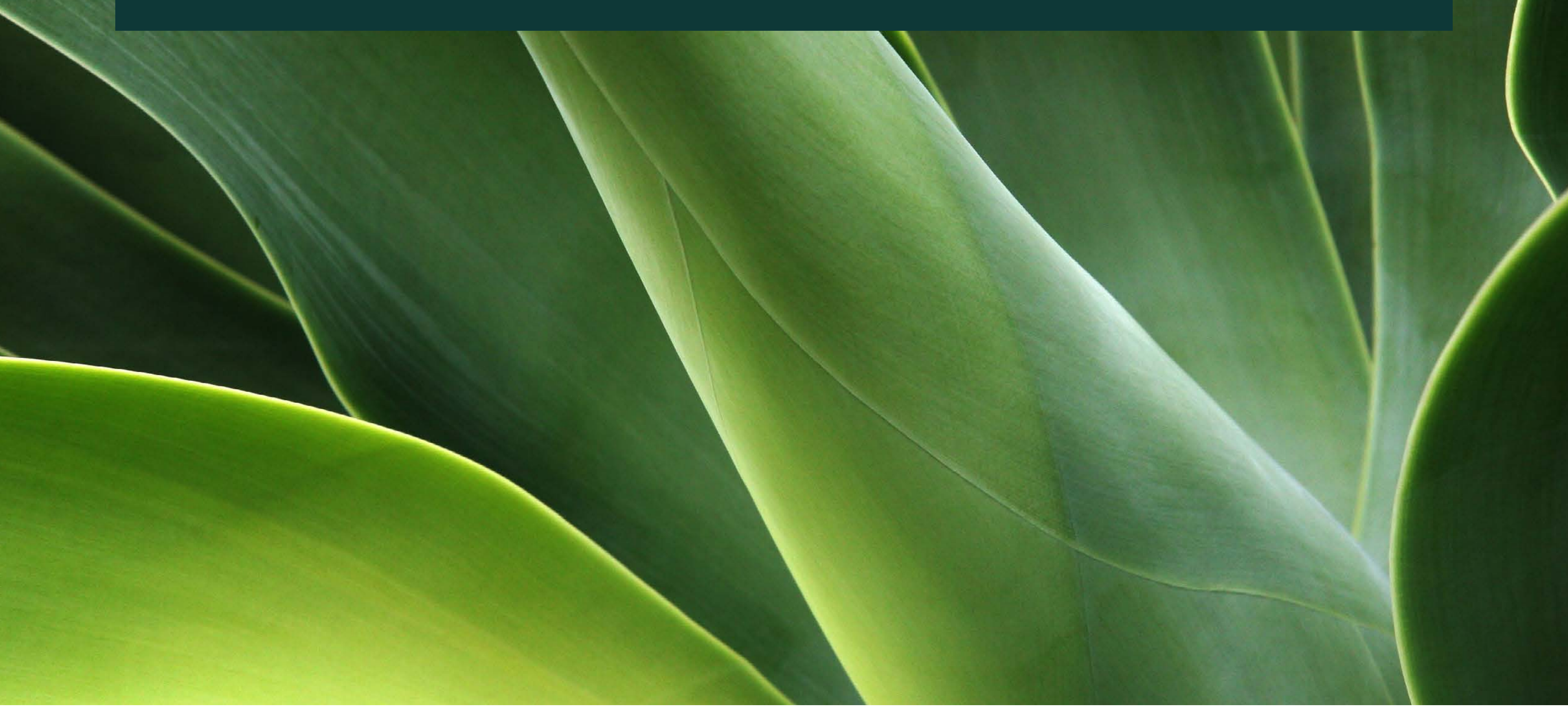
Technical innovations continue to move forward, as geopolitical tensions in particular heighten governmental support for policies and investment favoring domestic hardware development, cybersecurity infrastructure, clean technology (cleantech), efficient energy production, semiconductor manufacturing, and more.

In response, firms invest more heavily in due diligence and portfolio monitoring, looking to assess key risks across every business line, and identify opportunities for reducing costs, expanding bandwidth, and back-up resources.

Despite fears of economic slowdowns and other ongoing market challenges stemming from the COVID-19 pandemic and supply chain dislocations, the inexorable advance of technology spending and investment will likely sustain dealmaking at a moderate pace—barring outright calamities.

> "Given the current environment and looking ahead to the next few quarters, businesses with cash will look to invest in growth or actively acquire to consolidate; those without will wait until volatility subsides."

– Stan Luker, Partner, Transaction Advisory Services



SECTION THREE

Industry Trends

Technology continues to dramatically reshape economies, markets, and nations.

Smartphones transformed daily living for billions, enabling greater connectivity and new market niches for millions of applications, creating massive business opportunities. The ongoing shift to the cloud accelerated the evolution of computing and potential capacity. Traditional workplaces have all been revolutionized—and continue to change. The pace of change continues to accelerate into the increasingly volatile 2020s.

Gartner forecasts that worldwide IT spending should hit $4.4 trillion in 2022, a 4% increase from 2021 levels despite the volatility executives face.

Software spending is estimated to reach almost $675 billion in 2022, a growth rate of 9.8% from 2021 levels; 2023 is forecast to surge past $750 billion, **according to Gartner**. Devices saw the highest rate of growth in 2021, but Gartner estimates they may see the most dramatic contraction.

However, multiple factors could complicate these projections. Energy and food commodity prices climbed, contributing to global inflationary pressures. An increasing number of economic forecasts are turning grim.

For example, the European Commission's latest **European Economic Forecast** noted that slowing growth in the United States affects conditions for China, while real GDP looks set to only grow by 2.7% in the European Union this year.

Concurrently, technical innovation marches relentlessly ahead. Cresting the wave of innovation are proliferating AI applications, increased use of ML techniques to advance biotech platforms, innovation in cleantech development, expanded use of 3-D printing in manufacturing combined with next-generation nanomaterials, and more.

Technology M&A in the United States steadily grew throughout the 2010s and into the early 2020s, with 2021 seeing no less than $940 billion in aggregate deal value across more than 5,000 completed transactions. 2022 has seen a slowdown, however, with $443.1 billion across close to 2,000 completed deals as of mid-July.

Private players contributed significantly to those record tallies. PE firms cut close to 2,600 deals last year to exceed $450 billion in deal value. Thus far this year, that pace somewhat slows—just over 1,000 deals accounted for $208.3 billion.

The intersection of advances in foundational technologies will continue to create new niches for start-ups or encourage significant corporate investment, whether financial or strategic.

New concepts such as cybersecurity mesh—a more flexible approach to knitting together back-end architectures to enhance security tools—grow in popularity. Automation of many traditional IT processes speeds up business adaptability. Distributed capabilities and decentralization are increasingly in vogue as businesses look to reduce overall risks as cybercrime becomes more sophisticated.

This new wave of conceptualization will encourage executives to evolve their strategic thinking and investment decisions.

Heightened geopolitical tensions underscore the importance of national security, which is likely to encourage significant investment in domestic capacity for technical innovation, particularly on the hardware side.

"While collaboration tools like Slack, Zoom, Teams, and Jira allow a team to be fully distributed, many companies find that they need co-location and physical engagement of their team to create the culture, spirit, and productivity to drive success.

Companies simultaneously find that it's increasingly challenging to find, attract, develop, and retain talent. And many of them correctly recognize the importance of personal face-to-face interaction for the development of their people, products, and culture."

– Steven Schechter, Partner, Tax Services

"Some key areas of technical innovation include quantum SaaS-based solutions, AI deployment, and development and applications within the automotive industry."

– Stan Luker

"While challenges abound, such as staffing shortages and inflation, the demand for technology solutions remains high. Companies still look towards the future while their strategies evolve, such as looking to capital raises to bridge any gaps instead of seeking an IPO."

– Megan Hodgins, Senior Manager, Assurance Services

Deal metrics remain stubbornly resilient, however, given the extent of corporate cash and PE dry powder on hand. However, increased borrowing costs driven by rising interest rates are likely to shift the composition of debt packages.

Roiling public markets increasingly dammed up liquidity, discouraging many companies that planned to list publicly. On the venture side, for example, 556 exits occurred as of mid-July, relative to 1,527 total last year. However, it should be noted that although quarterly momentum lags, that tally compares well to pre-2021 annual tallies, with both 2019 and 2020 recording just over 1,000 completed exits.

From 2010 to midyear 2022, the AI and ML segment of technology may have seen some of the most explosive growth rates in VC dealmaking, jumping from just 136 completed deals in 2010 to close to 2,500 completed in 2021 for an aggregate of $58.8 billion.

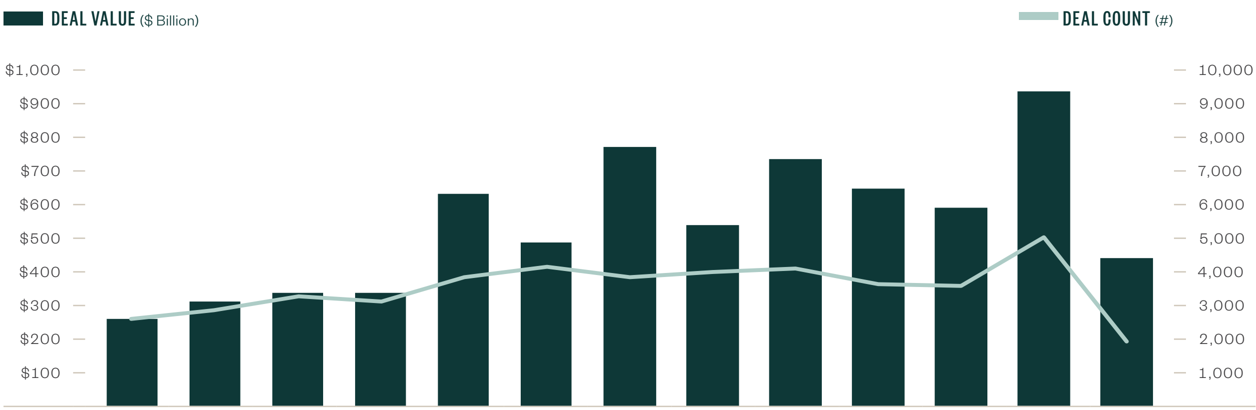
More generally, software consistently held a plurality of both deal value and volume across all asset classes.

SECTION FOUR

Market Landscape

M&A: BLOCKBUSTER DEALMAKING CYCLE STARTS TO SLOW

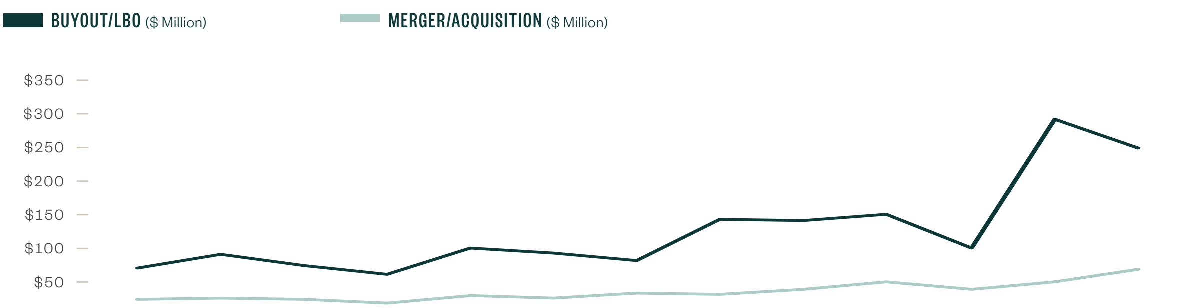
FIGURE 1: M&A Deal Activity



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$261.4	$311.9	$336.5	$340.5	$632.7	$490.3	$772.4	$542.8	$740.7	$648.5	$593.2	$940.0	$443.1
COUNT	2,601	2,869	3,263	3,144	3,856	4,165	3,833	3,991	4,119	3,646	3,577	5,041	1,949

*As of July 12, 2022

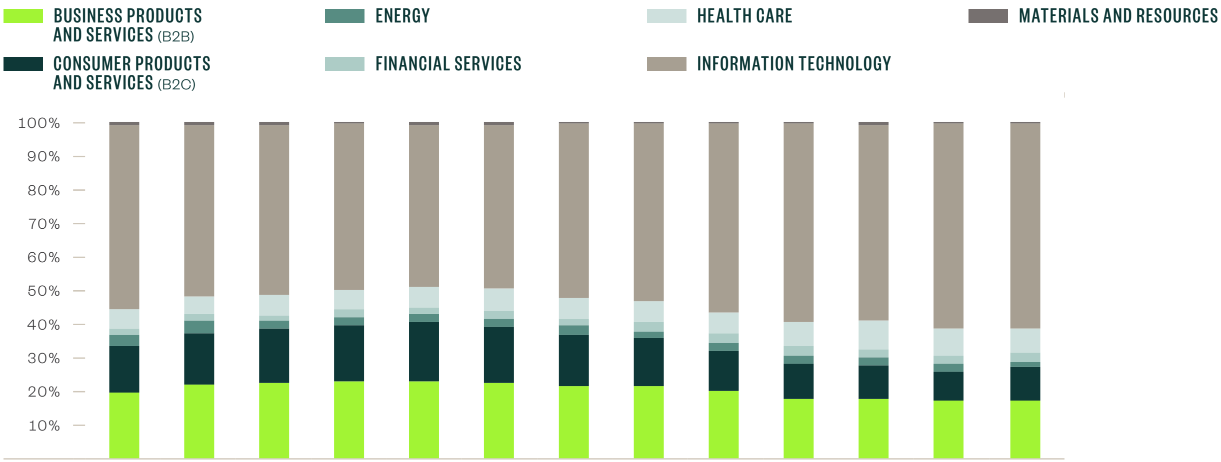
FIGURE 2: Median M&A Deal Size ($M) by Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
LEVERAGED BUYOUT (LBO)	$70.0	$90.0	$73.5	$60.0	$100.0	$92.3	$81.0	$142.5	$140.0	$149.0	$100.0	$290.0	$248.3
MERGER/ ACQUISITION	$23.0	$25.2	$23.5	$18.3	$28.8	$24.9	$33.4	$31.8	$39.1	$49.4	$38.0	$49.5	$69.0

*As of July 12, 2022

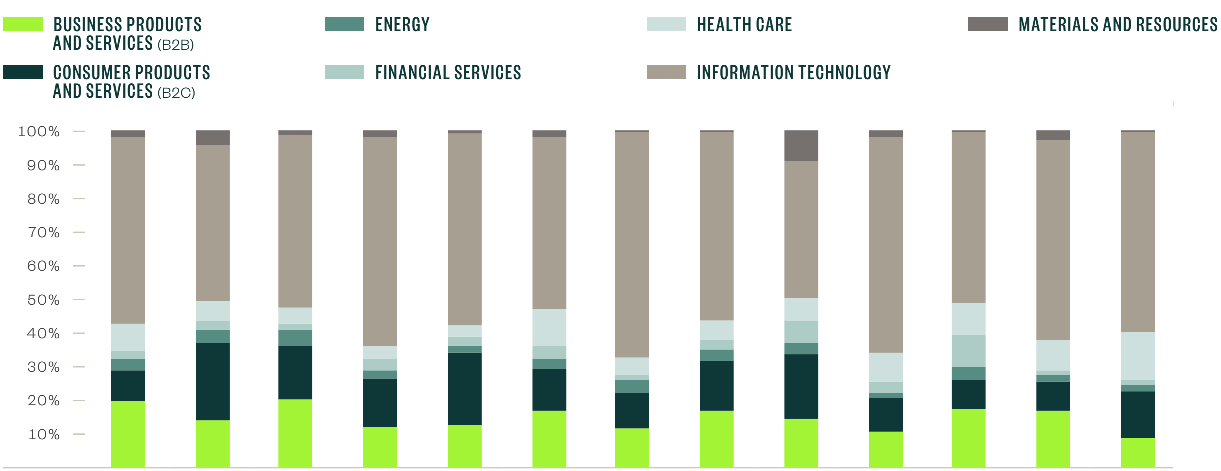
FIGURE 3: M&A Deal Activity (#) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	507	625	728	722	882	932	813	844	820	639	618	865	334
	360	442	521	511	667	681	588	575	480	383	357	434	193
	88	103	82	83	103	109	104	83	98	77	91	105	31
	44	52	52	73	76	106	79	111	121	105	91	132	49
	148	159	192	180	233	265	236	253	263	261	305	400	145
	1,432	1,458	1,657	1,551	1,847	2,036	1,990	2,100	2,313	2,156	2,078	3,065	1,188
	22	30	31	24	48	36	23	25	24	25	37	40	9

*As of July 12, 2022

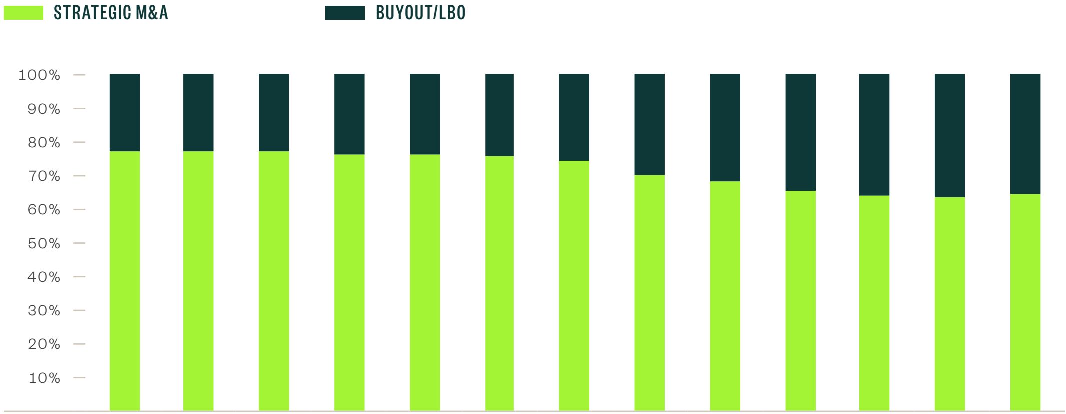
FIGURE 4: M&A Deal Activity ($B) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$50.8	$42.5	$66.5	$39.5	$77.5	$80.2	$86.6	$90.1	$103.7	$68.2	$100.3	$157.7	$36.5
	$23.5	$72.3	$53.3	$48.9	$137.5	$62.9	$82.9	$80.1	$144.5	$63.6	$51.9	$80.2	$63.2
	$9.7	$11.1	$16.1	$8.6	$11.6	$12.3	$28.1	$18.0	$23.0	$11.1	$22.2	$18.8	$7.1
	$6.2	$9.1	$6.2	$11.0	$16.7	$19.4	$10.4	$16.6	$50.4	$21.8	$56.3	$13.5	$6.5
	$21.3	$18.0	$17.1	$13.8	$22.4	$55.4	$41.9	$31.9	$49.6	$55.5	$59.0	$84.3	$64.9
	$144.9	$145.7	$172.1	$212.4	$360.5	$251.6	$520.3	$302.8	$301.4	$415.6	$300.8	$561.0	$264.0
	$5.2	$13.2	$5.1	$6.2	$6.4	$8.6	$2.3	$3.4	$68.1	$12.7	$2.6	$24.6	$1.0

*As of July 12, 2022

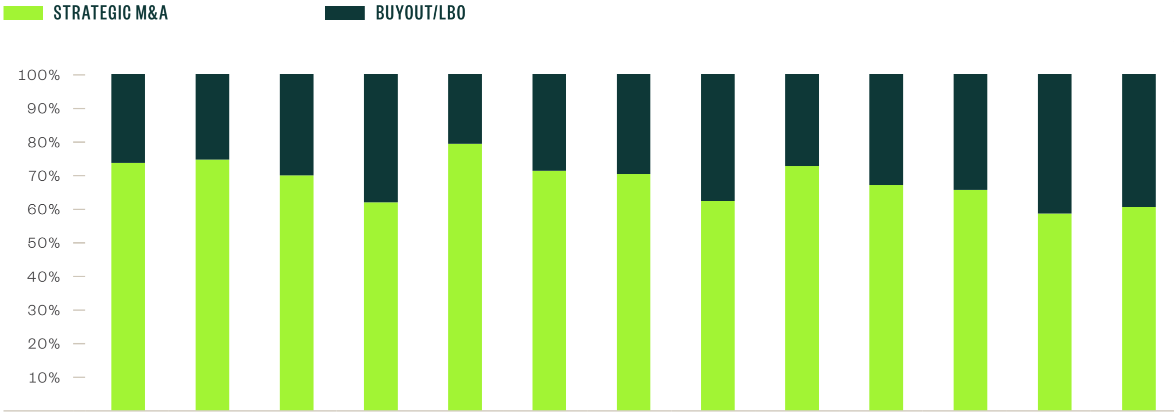
FIGURE 5: M&A Deal Activity (#) by Deal Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	2,004	2,204	2,508	2,387	2,921	3,151	2,834	2,791	2,796	2,373	2,275	3,195	1,255
	597	665	755	757	935	1,014	999	1,200	1,323	1,273	1,302	1,846	694

*As of July 12, 2022

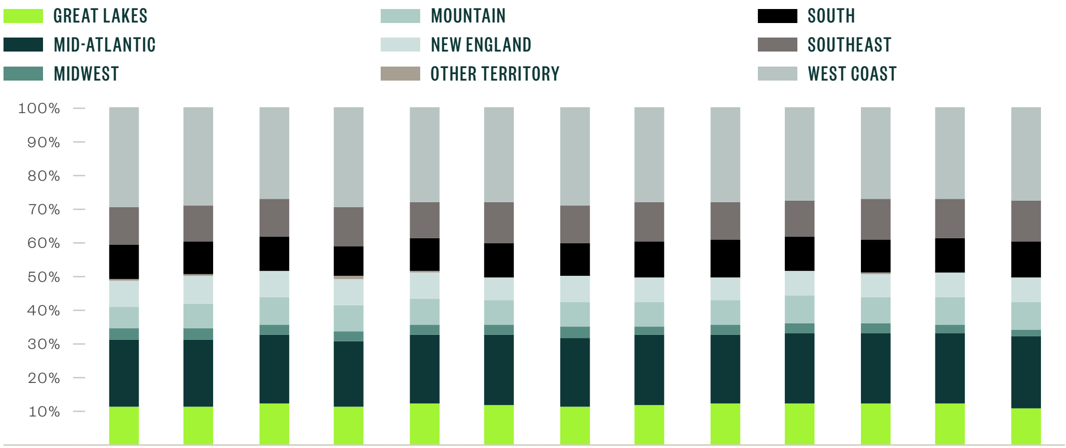
FIGURE 6: M&A Deal Activity ($B) by Deal Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$192.9	$232.6	$236.1	$211.1	$501.1	$351.0	$545.1	$339.2	$538.8	$435.3	$389.4	$552.2	$267.2
	$68.5	$79.3	$100.4	$129.4	$131.5	$139.3	$227.4	$203.6	$201.9	$213.2	$203.8	$387.8	$175.9

*As of July 12, 2022

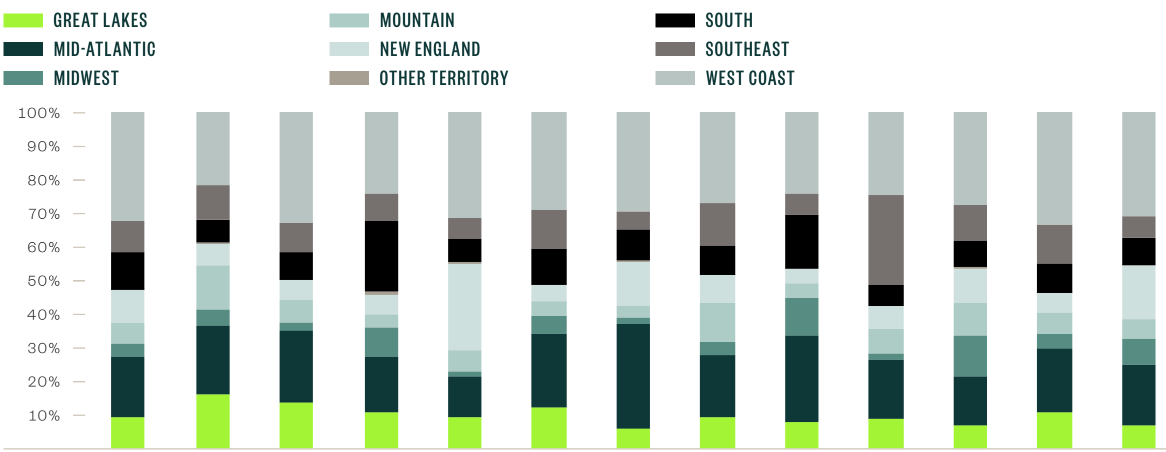
FIGURE 7: M&A Deal Activity (#) by US Region



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Great Lakes	284	312	386	345	469	476	427	457	501	436	435	616	210
Mid-Atlantic	514	576	664	607	766	865	778	836	822	767	732	1,040	410
Midwest	78	89	91	86	121	128	125	95	112	101	103	133	44
Mountain	172	203	263	253	298	292	285	290	303	293	283	406	154
New England	197	244	250	235	297	278	291	286	279	266	250	364	140
Other Territory	4	7	9	29	15	12	5	4	3	0	3	3	3
South	262	284	324	282	376	424	363	410	448	365	354	510	210
Southeast	297	301	366	354	417	501	432	474	454	396	435	590	239
West Coast	750	824	873	928	1,065	1,152	1,108	1,104	1,150	999	963	1,353	531

*As of July 12, 2022

FIGURE 8: M&A Deal Activity ($B) by US Region



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$23.2	$49.7	$44.7	$35.6	$55.8	$59.2	$43.4	$47.5	$54.4	$54.0	$40.3	$97.9	$29.8
	$47.1	$63.0	$72.7	$56.1	$78.2	$106.9	$241.6	$100.9	$193.6	$115.1	$85.4	$177.7	$79.4
	$10.6	$14.8	$7.6	$29.6	$9.3	$26.1	$12.3	$20.2	$80.9	$13.6	$70.7	$42.6	$35.0
	$15.6	$41.9	$22.6	$14.1	$38.7	$20.4	$29.1	$64.2	$30.9	$46.6	$57.7	$57.6	$25.7
	$25.2	$19.6	$19.7	$20.0	$163.5	$24.8	$102.0	$44.3	$33.0	$44.0	$61.8	$54.6	$70.8
	$0.6	$0.3	$0.5	$2.5	$2.5	$0.7	$0.3	$0.3	$0.2	$0.0	$2.1	$0.2	$0.3
	$29.0	$21.9	$26.8	$70.5	$41.6	$51.3	$74.1	$45.2	$118.7	$41.1	$45.9	$84.9	$36.9
	$23.5	$31.7	$29.6	$28.0	$41.8	$56.8	$39.8	$69.4	$47.5	$173.2	$62.9	$107.0	$26.1
	$84.7	$67.7	$110.3	$83.0	$197.5	$142.4	$229.1	$145.8	$178.4	$159.6	$164.8	$316.2	$138.4

*As of July 12, 2022

After more than half a decade of blockbuster technology M&A, 2021 set new highs in a frenzy of dealmaking with more than 5,000 completed transactions. It's difficult to say when that level of volume will be seen again. Moreover, sky-high deal multiples produced the largest annual tally of deal value yet, at $940 billion.

Midway through 2022, aggregate deal value remained healthy even as volume slumped, with just shy of 2,000 transactions closed by mid-July. The market landscape became more complex and nuanced in 2022, however. Interest rate hikes have made financing pricier, while volatility in public markets complicated stock portions of transactions. Major tech giants paused or at least slowed their hiring efforts.

Although deal sizes remain stubbornly high in 2022 so far, the decline in the median buyout size from 2021's peak of $290 million to 2022's year-to-date tally of $248.3 million could presage further reductions.

> "Strategic investors are looking for deals still, but conserving cash by trying to lower valuations being pitched."
>
> – Stan Luker

Breaking down dealmaking by sectors, the proliferation of enterprise software-as-a-service (SaaS) models across multiple sectors drove the bulk of consolidation via M&A across technology. However, outlier deals in other key software sectors, such as finance, also skewed annual tallies of deal value.

The growing proportion of aggregate deal value driven by PE players is a major contributor to that skew, for reasons examined in the PE section below.

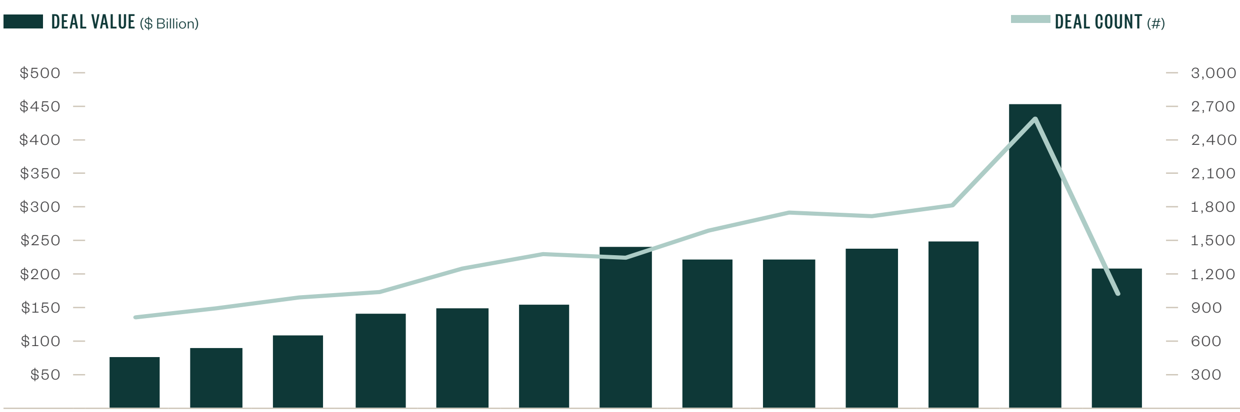
Such outlier deals likely occurred most frequently on the US West Coast, given that region's growing dominance of aggregate M&A deal value in the past two and a half years.

Interestingly, the consistency of M&A volume across major US regions suggests that middle-market consolidation helped ensure a steady flow of volume for much of the past decade.

> "With the pandemic and the intervening passage of time, we have seen the once-normal approach to work move to a much more distributed hub and spoke network—no longer offices, but living rooms, coffee shops, homes offices, and desks in the corners of bedrooms."
>
> – Steven Schechter

PE BUYERS PULL BACK, BUT FOR HOW LONG?

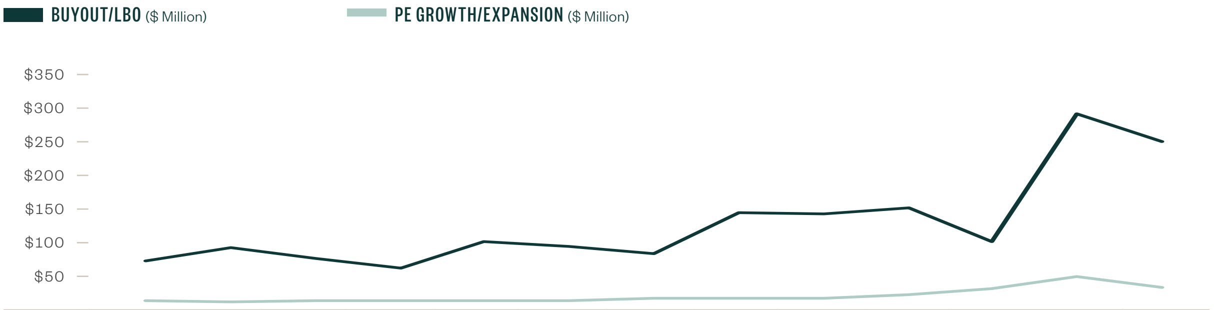
FIGURE 9: PE Deal Activity



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$75.6	$86.9	$107.7	$140.7	$147.9	$152.4	$238.9	$221.2	$221.1	$238.4	$249.1	$453.2	$208.3
COUNT	808	889	991	1,027	1,246	1,376	1,345	1,588	1,741	1,719	1,808	2,592	1,022

*As of July 29, 2022

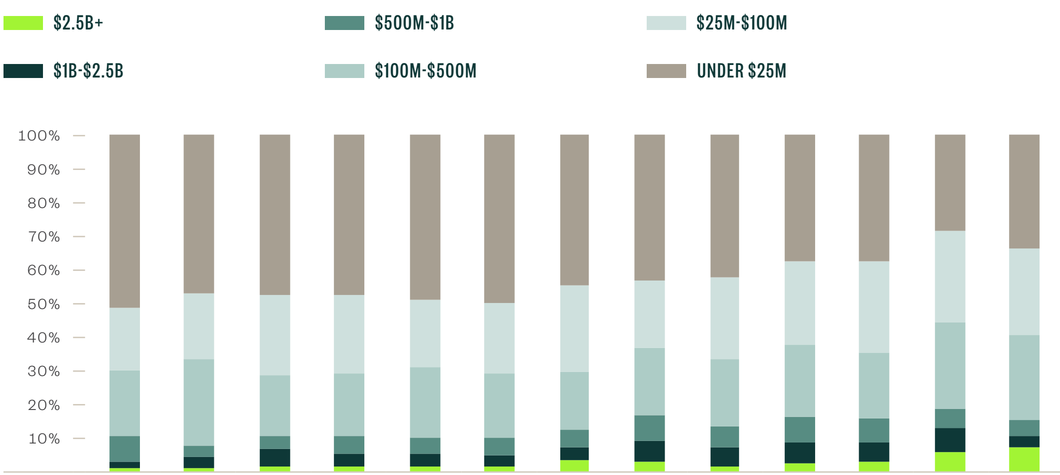
FIGURE 10: Median PE Deal Size ($M) by Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
BUYOUT/ LBO	$70.0	$90.0	$73.5	$60.0	$100.0	$92.3	$81.0	$142.5	$140.0	$149.0	$100.0	$290.0	$248.3
PE GROWTH/ EXPANSION	$10.0	$7.8	$10.0	$10.0	$10.0	$10.0	$15.0	$14.1	$15.0	$20.0	$29.2	$46.8	$31.0

*As of July 29, 2022

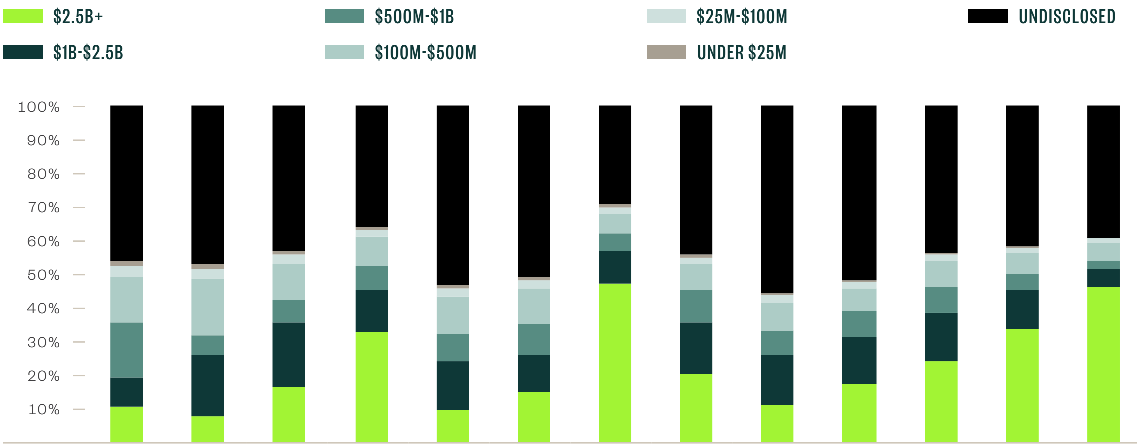
FIGURE 11: PE Deal Activity (#) by Size



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	2	2	4	4	4	5	12	11	5	8	11	28	13
	5	9	14	12	13	11	15	24	23	22	23	37	7
	19	8	10	16	16	20	19	30	23	27	29	30	9
	50	65	49	57	72	69	65	79	78	77	79	136	48
	48	50	65	71	69	76	99	80	96	89	111	142	48
	132	120	129	147	169	183	171	173	166	135	154	149	65

*As of July 29, 2022

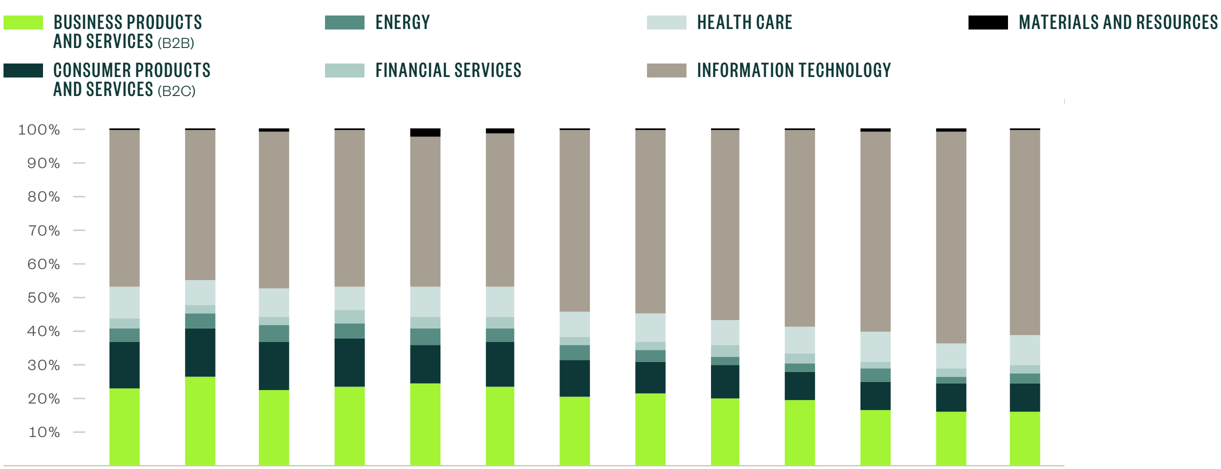
FIGURE 12: PE Deal Activity ($B) by Size



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$8.2	$6.6	$17.7	$46.0	$14.7	$22.9	$112.8	$45.1	$24.7	$42.0	$59.6	$152.4	$96.6
	$6.3	$16.1	$20.9	$17.5	$21.4	$16.8	$22.6	$34.2	$33.2	$33.0	$36.1	$53.4	$10.4
	$12.6	$5.0	$7.2	$10.4	$11.4	$14.3	$12.8	$21.0	$16.0	$18.1	$19.5	$20.8	$5.7
	$10.2	$14.5	$11.0	$11.7	$16.5	$15.9	$13.8	$17.3	$17.8	$16.1	$18.5	$28.0	$10.9
	$2.5	$2.7	$3.4	$3.1	$3.5	$3.5	$4.9	$3.9	$4.8	$4.5	$5.4	$7.5	$2.4
	$1.2	$1.0	$1.1	$1.3	$1.4	$1.5	$1.4	$1.4	$1.5	$1.3	$1.4	$1.6	$0.4
	$34.7	$41.0	$46.5	$50.7	$79.0	$77.5	$70.6	$98.2	$123.2	$123.4	$108.5	$189.5	$81.8

*As of July 29, 2022

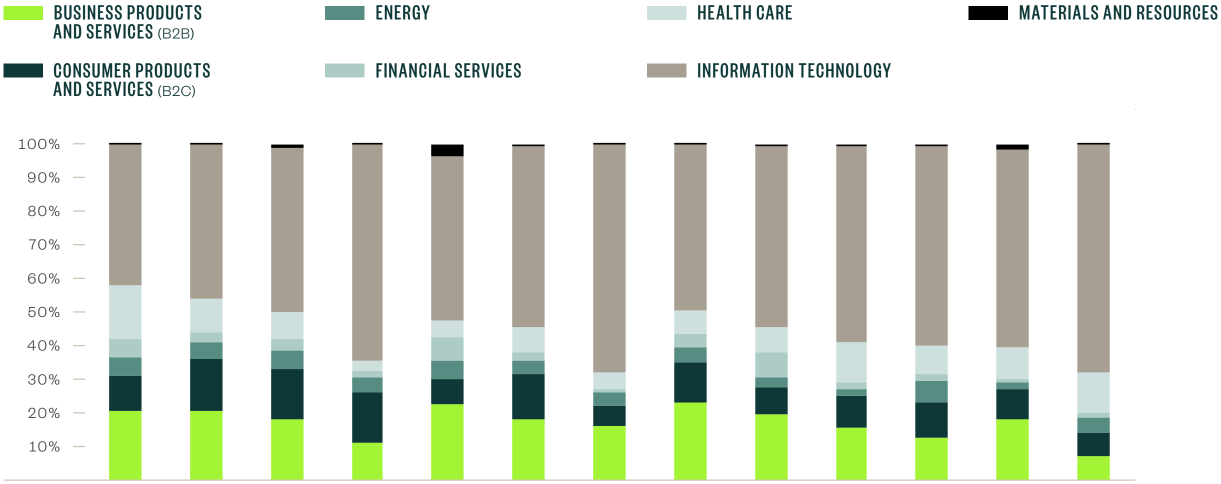
FIGURE 13: PE Deal Activity (#) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	184	234	221	241	303	319	275	337	345	334	295	412	161
	112	126	144	146	144	185	142	152	169	140	155	211	89
	34	43	45	48	59	55	66	56	50	43	66	62	29
	24	20	25	37	43	45	33	40	56	50	37	54	26
	73	68	88	74	111	126	98	130	134	141	166	204	92
	379	393	459	476	557	630	724	866	980	1,002	1,076	1,628	619
	2	5	9	5	29	16	7	7	7	9	13	21	6

*As of July 29, 2022

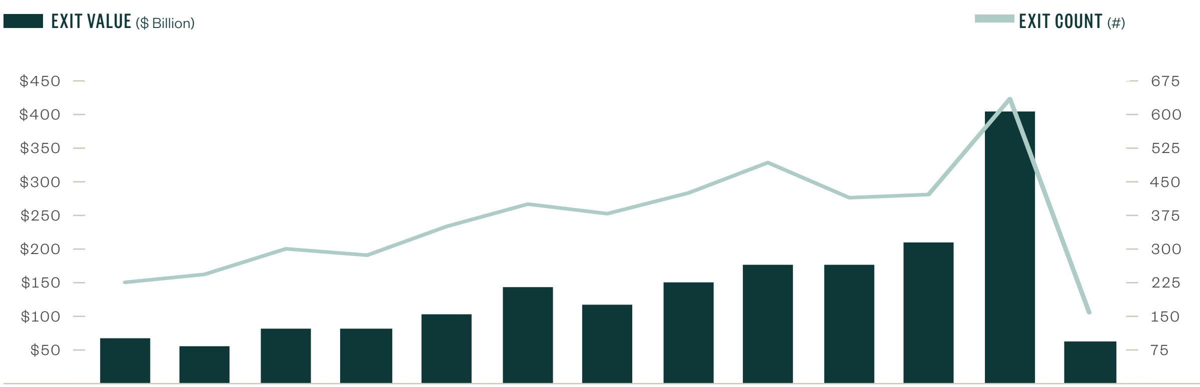
FIGURE 14: PE Deal Activity ($B) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$15.2	$17.8	$19.0	$15.2	$33.4	$27.5	$37.8	$50.7	$43.1	$36.7	$30.4	$80.0	$14.6
	$8.2	$13.2	$16.2	$21.3	$10.9	$20.0	$14.7	$26.7	$17.3	$22.1	$26.6	$40.8	$13.9
	$4.1	$4.4	$5.9	$5.9	$8.2	$6.4	$8.6	$10.1	$7.1	$4.8	$16.4	$9.2	$9.6
	$4.3	$2.6	$4.0	$2.9	$9.7	$3.9	$2.9	$7.9	$16.3	$4.9	$4.4	$6.2	$2.9
	$11.9	$8.9	$8.4	$4.3	$8.1	$11.6	$12.3	$15.8	$16.6	$28.8	$21.5	$43.1	$25.5
	$31.8	$39.8	$53.0	$90.5	$72.1	$82.4	$162.2	$109.2	$119.7	$140.0	$148.7	$266.4	$141.0
	$0.1	$0.3	$1.2	$0.5	$5.4	$0.7	$0.4	$0.8	$1.1	$1.1	$1.1	$7.6	$0.7

*As of July 29, 2022

FIGURE 15: PE Exit Activity

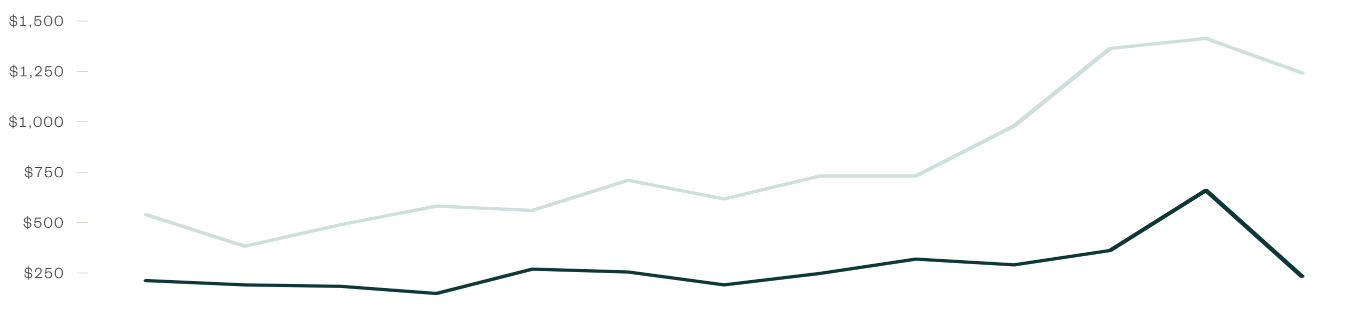


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$65.9	$55.5	$80.2	$81.6	$103.1	$142.2	$116.0	$150.3	$175.9	$176.1	$209.9	$404.3	$62.8
COUNT	226	243	298	284	351	400	379	425	491	414	421	634	156

*As of July 12, 2022

FIGURE 16: Average & Median PE Exit Size ($M)

MEDIAN ($ Million) AVERAGE ($ Million)

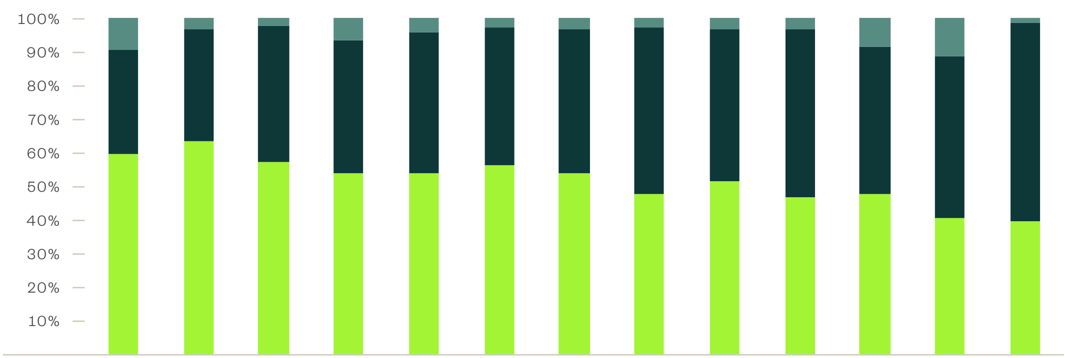


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
MEDIAN	$194.5	$173.5	$168.5	$132.5	$250.0	$239.0	$175.0	$235.0	$302.3	$277.7	$350.0	$651.4	$220.0
AVERAGE	$525.8	$368.1	$479.5	$569.4	$551.7	$702.3	$602.7	$720.9	$721.8	$975.6	$1,365.7	$1,413.8	$1,239.6

*As of July 12, 2022

FIGURE 17: PE Exit Activity (#) by Type

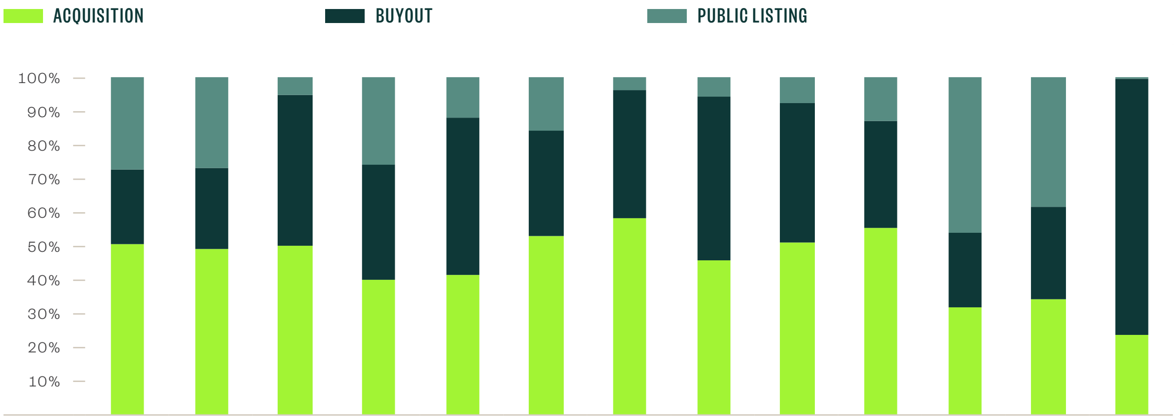
ACQUISITION BUYOUT PUBLIC LISTING



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	135	154	171	153	189	226	204	203	252	193	200	257	62
	70	81	120	112	147	163	163	211	222	207	185	305	92
	21	8	7	19	15	11	12	11	17	14	36	72	2

*As of July 12, 2022

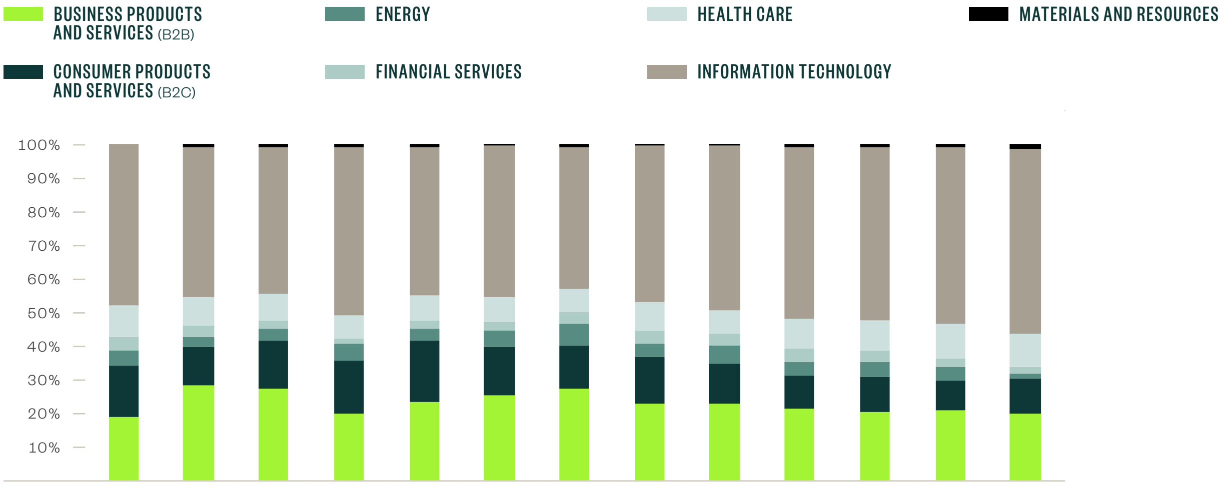
FIGURE 18: PE Exit Activity ($B) by Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Acquisition	$33.3	$27.3	$40.1	$32.7	$42.6	$75.6	$67.7	$68.4	$89.3	$97.8	$66.7	$138.6	$14.8
Buyout	$14.6	$13.3	$35.8	$27.6	$48.3	$43.9	$43.6	$73.4	$73.4	$55.6	$46.6	$111.2	$47.7
Public Listing	$17.9	$14.9	$4.3	$21.3	$12.2	$22.7	$4.7	$8.6	$13.2	$22.7	$96.6	$154.5	$0.3

*As of July 12, 2022

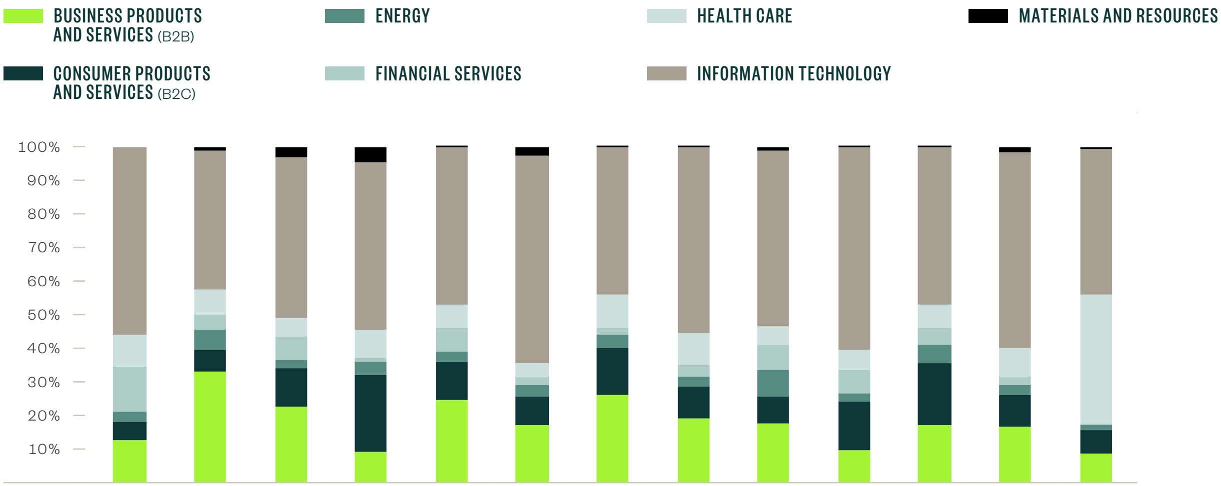
FIGURE 19: PE Exit Activity (#) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Business Products and Services (B2B)	43	69	81	56	83	101	103	97	113	89	87	133	31
Consumer Products and Services (B2C)	35	28	44	46	63	58	50	60	59	41	43	57	16
Energy	10	7	9	14	12	19	24	17	25	17	18	23	3
Financial Services	9	8	8	4	9	10	13	17	17	15	16	16	3
Health Care	21	21	24	20	26	30	27	35	35	38	37	66	15
Information Technology	108	108	130	142	155	180	159	198	240	211	217	333	86
Materials and Resources	0	2	2	2	3	2	3	1	2	3	3	6	2

*As of July 12, 2022

FIGURE 20: PE Exit Activity ($B) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$8.2	$18.1	$18.0	$7.1	$25.1	$23.7	$30.0	$28.6	$30.2	$16.8	$35.2	$66.6	$5.3
	$3.7	$3.5	$9.0	$19.1	$11.6	$12.3	$16.1	$14.1	$14.3	$25.1	$39.4	$37.0	$4.2
	$1.7	$3.4	$2.0	$2.9	$3.3	$4.9	$4.9	$4.4	$13.8	$4.8	$10.9	$13.7	$0.9
	$8.8	$2.6	$5.6	$0.9	$7.3	$3.7	$1.8	$5.6	$13.0	$11.6	$11.0	$8.6	$0.4
	$6.4	$4.1	$4.5	$6.8	$7.2	$6.0	$11.7	$14.0	$10.4	$11.0	$14.1	$35.6	$24.0
	$37.0	$23.2	$38.5	$41.1	$48.4	$87.9	$50.9	$83.6	$91.9	$106.1	$98.9	$236.7	$27.6
	$0.0	$0.5	$2.6	$3.7	$0.2	$3.8	$0.5	$0.0	$2.1	$0.7	$0.3	$6.1	$0.3

*As of July 12, 2022

With capital overhang well over a trillion dollars worldwide as of the end of 2021, PE buyout shops can acquire targets. Although the market landscape is increasingly rife with potential risks, given buyout fund investment mandates and the popularity and utility of SaaS business models for PE operating theses, it's possible the US technology middle market will continue to see resilient PE dealmaking volume.

Fund managers may shy away from the high-end deal price tags observed in the late 2010s and early 2020s, but once economic conditions are better understood and markets reprice, some businesses may be viewed as bargains.

The proliferation of SaaS and cloud-based offerings into specific sector niches in which PE fund managers had prior expertise, such as retail investor financial services, indicate add-on possibilities still exist. Granted, such a turn of the cycle takes time, especially in private markets, so for some time aggregate deal value and volume could be muted relative to prior levels.

> "Depending on where the given firm is in its fund life-cycle, fund managers are either conserving cash and picking portfolio winners, or looking for add-on opportunities."
>
> – Stan Luker

While dealmakers may ratchet down activity for a time to better assess risk levels, liquidity prospects for PE portfolio companies may be cloudier. 2021 saw an opportunistic surge in exits, with 634 technology companies exiting for well over $400 billion in aggregate value.

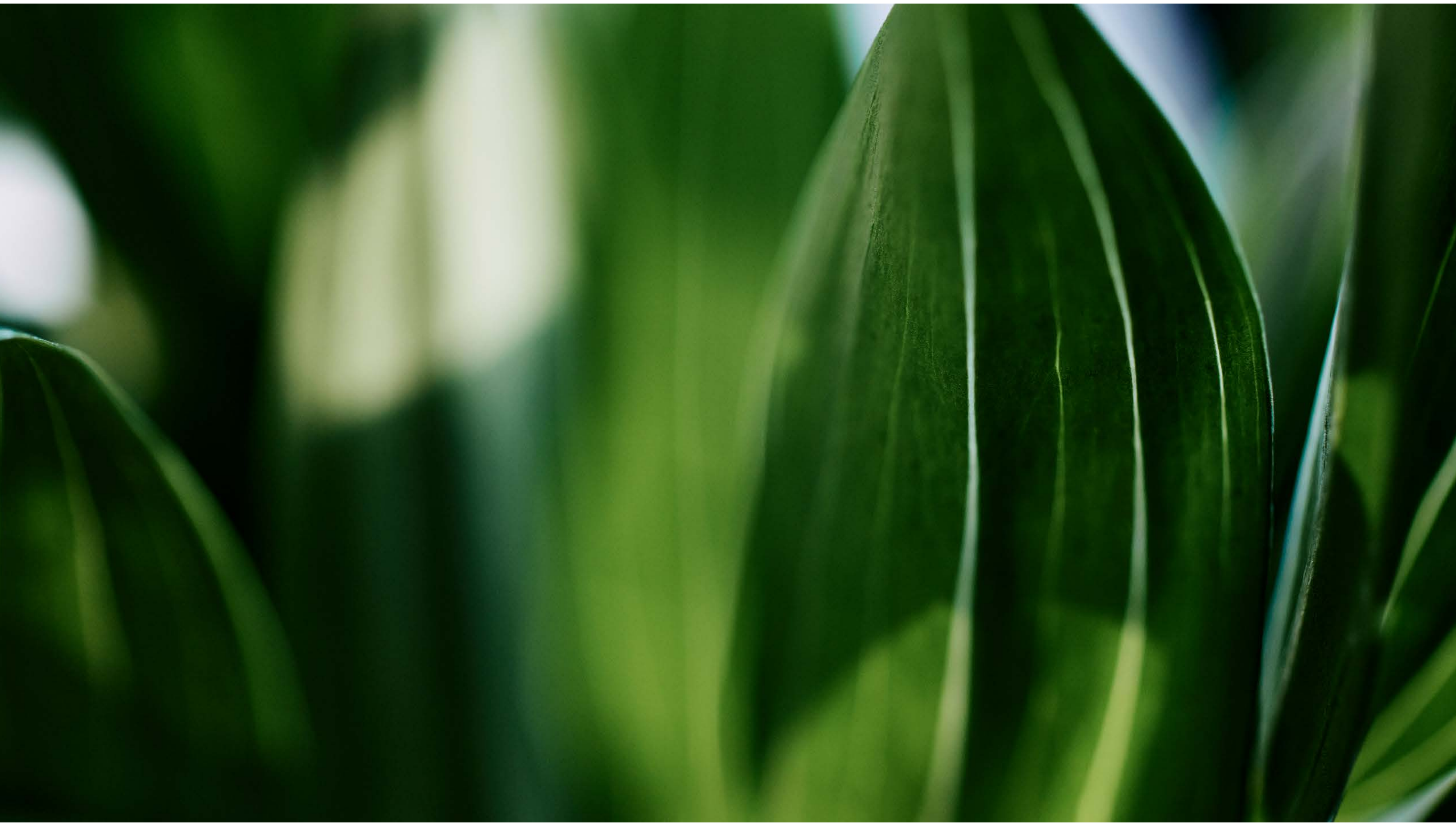
The historic skew in average exit size in the past few years speaks to the primary liquidity driver: public listings during an unprecedented bull market in equities.

While strategic buyers have been the primary drivers of volume in the past, joined by prolific secondary buyout sponsors beginning in the mid-2010s, there's no precedent for the spate of PE-backed technology public listings that occurred between 2020 and 2021. 2020 saw nearly $97 billion close across 36 public listings, while 2021 saw twice as many listings generate $154.5 billion.

> "Companies are likelier than before to seek advice in navigating their options, especially when it comes to pathways to public listings, given market volatility."
>
> – Megan Hodgins

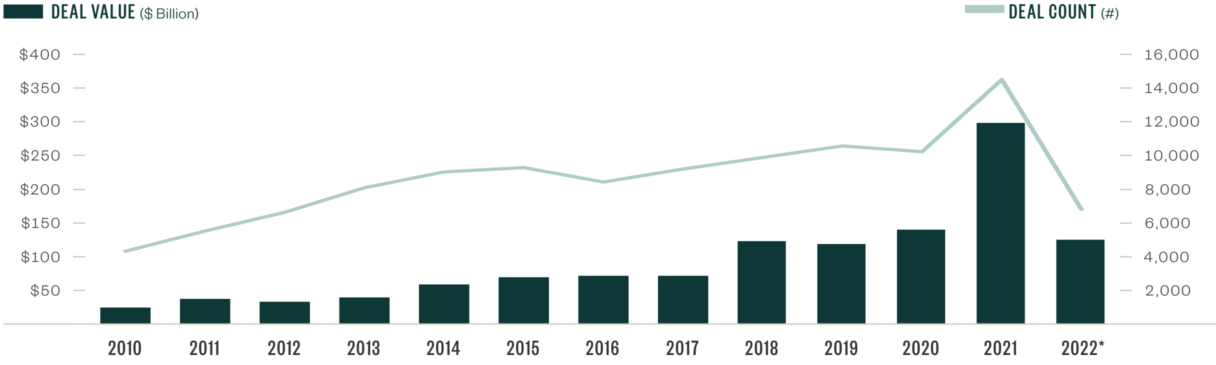
Since the uniquely favorable conditions for public debuts in 2021, however, PE fund managers have been wary; just two PE-backed technology listings occurred so far in 2022. Aggregate exit value suffered as a result, with just $62.8 billion across 156 exits by mid-July 2022.

This volume is more reminiscent of the early 2010s. It remains to be seen how long it may take for liquidity prospects to brighten, given that buyers and portfolio managers across the board are biding their time until there's greater clarity around economic slowdowns and market volatility.



VC: CAUTIOUS ENVIRONMENT STILL AWASH IN CAPITAL

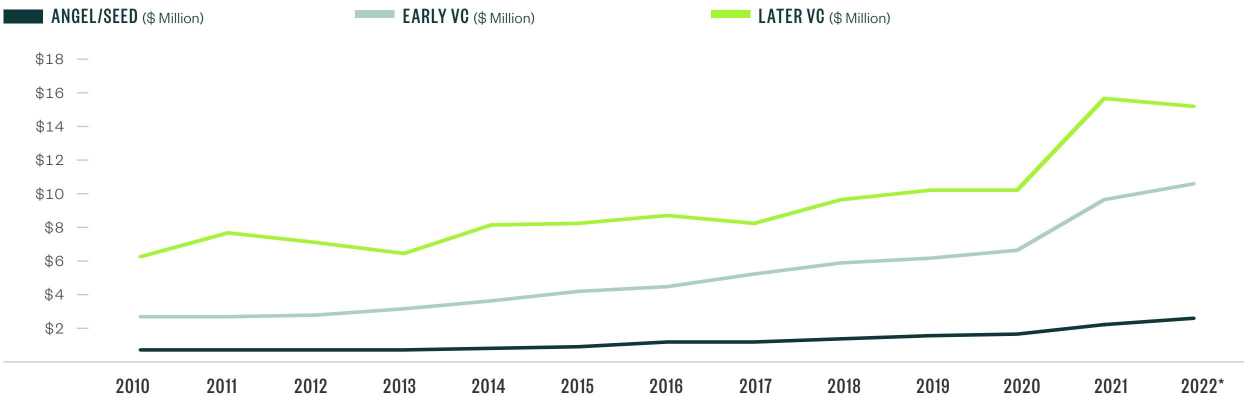
FIGURE 21: VC Deal Activity



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$24.0	$35.6	$32.7	$38.2	$58.8	$68.6	$70.3	$71.1	$123.3	$117.8	$138.9	$298.1	$124.0
COUNT	4,272	5,488	6,597	8,043	8,986	9,297	8,425	9,196	9,914	10,523	10,258	14,474	6,814

*As of July 12, 2022

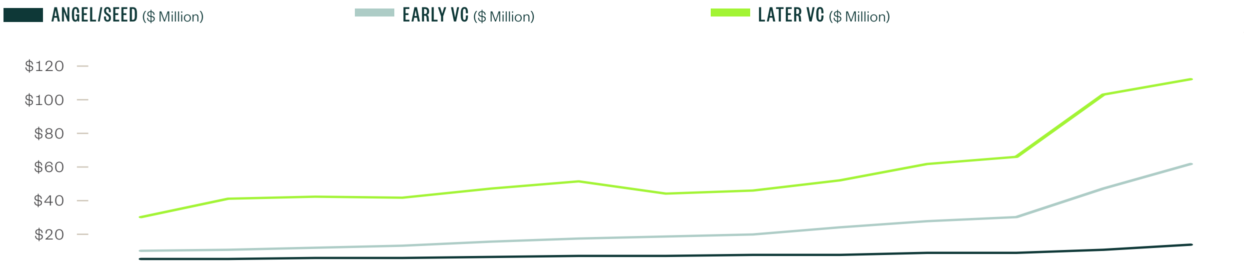
FIGURE 22: Median VC Deal Size ($M) by Stage



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
ANGEL/ SEED	$0.5	$0.5	$0.5	$0.5	$0.6	$0.8	$1.0	$1.0	$1.2	$1.4	$1.5	$2.0	$2.4
EARLY VC	$2.5	$2.5	$2.6	$3.0	$3.5	$4.0	$4.3	$5.0	$5.8	$6.0	$6.5	$9.5	$10.4
LATER VC	$6.0	$7.5	$6.9	$6.2	$8.0	$8.1	$8.5	$8.1	$9.5	$10.0	$10.0	$15.5	$15.0

*As of July 12, 2022

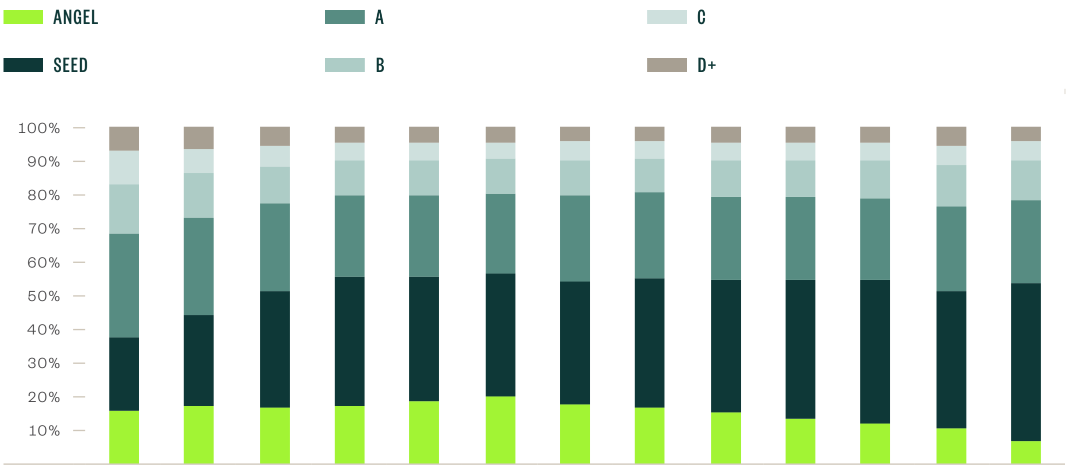
FIGURE 23: Median Pre-Money VC Valuations ($M) by Stage



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
ANGEL/ SEED	$3.4	$3.5	$3.8	$4.0	$4.5	$5.0	$5.0	$5.6	$6.0	$7.0	$7.0	$9.0	$12.0
EARLY VC	$8.0	$9.0	$10.0	$11.5	$14.0	$15.5	$17.0	$18.0	$22.0	$26.0	$28.0	$45.0	$60.0
LATER VC	$28.3	$38.9	$40.6	$39.8	$45.4	$49.3	$42.0	$44.0	$50.0	$59.6	$64.0	$101.0	$110.0

*As of July 12, 2022

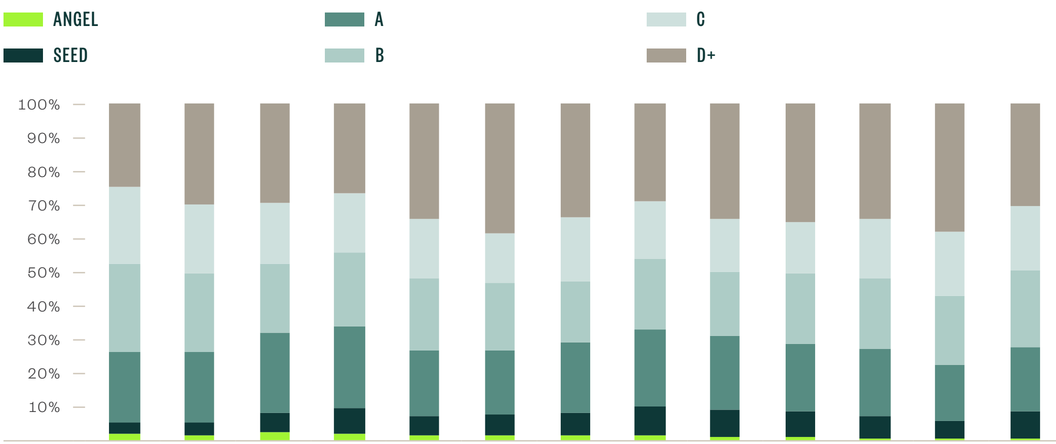
FIGURE 24: VC Deal Activity (#) by Series



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	516	754	887	1,109	1,352	1,514	1,185	1,198	1,147	1,036	897	1,057	303
	716	1,160	1,848	2,464	2,721	2,768	2,512	2,772	3,029	3,262	3,285	4,247	2,080
	1,004	1,263	1,419	1,578	1,773	1,809	1,731	1,842	1,892	1,933	1,824	2,558	1,106
	485	582	579	662	742	769	726	750	828	854	875	1,261	540
	322	311	313	325	384	362	362	369	378	422	390	622	247
	234	285	314	316	358	375	304	302	371	371	368	575	187

*As of July 12, 2022

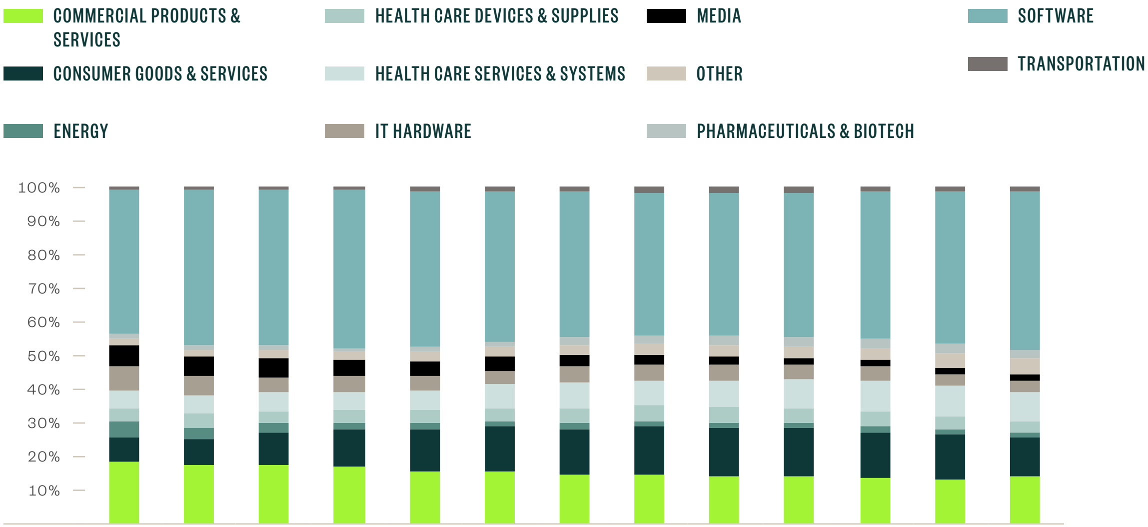
FIGURE 25: VC Deal Activity ($B) by Series



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$0.3	$0.4	$0.6	$0.6	$0.7	$0.7	$0.6	$0.7	$0.8	$0.8	$0.6	$0.8	$0.4
	$0.6	$1.0	$1.6	$2.3	$2.9	$3.8	$4.1	$5.3	$7.7	$7.9	$7.9	$13.1	$8.2
	$4.1	$5.8	$6.5	$7.7	$10.0	$12.1	$13.0	$14.4	$20.3	$21.2	$23.5	$44.1	$19.8
	$5.0	$6.5	$5.6	$6.9	$10.9	$12.6	$10.9	$13.4	$17.9	$21.7	$25.1	$53.0	$23.4
	$4.4	$5.7	$5.1	$5.6	$9.1	$9.1	$11.6	$10.7	$15.1	$16.0	$20.8	$48.7	$19.7
	$4.8	$8.4	$8.1	$8.4	$17.8	$24.2	$20.9	$18.5	$32.3	$36.8	$41.1	$99.5	$31.7

*As of July 12, 2022

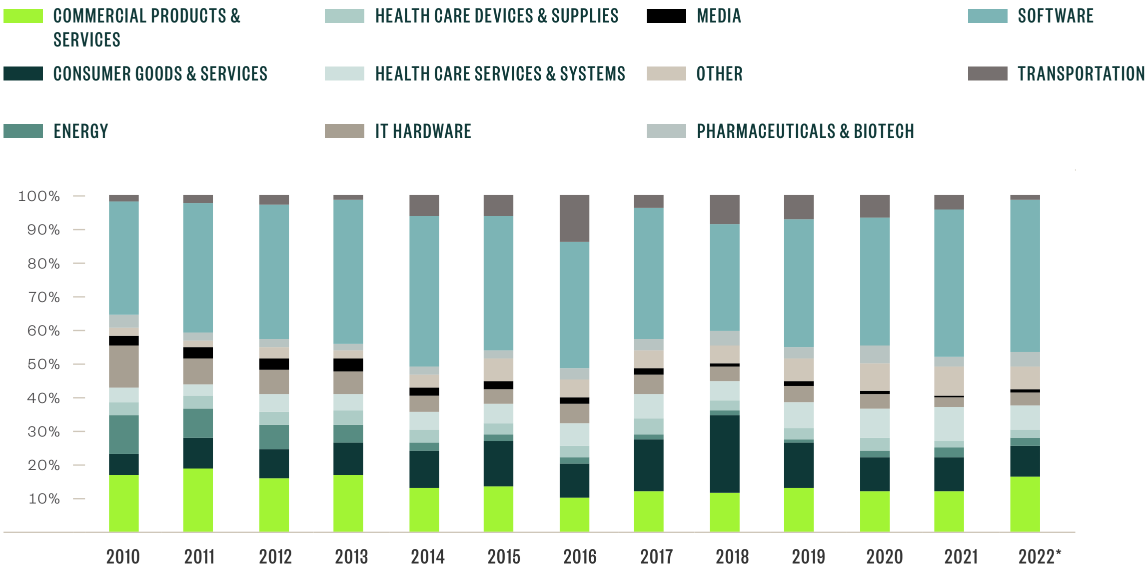
FIGURE 26: VC Deal Activity (#) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	779	948	1,162	1,362	1,397	1,437	1,220	1,317	1,382	1,454	1,402	1,903	949
	310	433	619	875	1,120	1,240	1,141	1,334	1,423	1,525	1,375	1,907	782
	213	194	185	181	185	157	177	144	160	165	171	256	113
	155	229	231	278	315	364	357	420	460	452	462	567	235
	225	275	370	452	530	633	643	703	767	899	939	1,275	572
	316	320	295	367	377	392	400	435	503	469	449	509	240
	260	326	367	397	394	366	281	266	215	206	167	248	123
	77	106	160	177	260	283	258	292	337	353	392	632	325
	73	82	107	99	135	155	176	233	273	300	296	417	180
	1,829	2,520	3,048	3,784	4,159	4,156	3,653	3,883	4,209	4,516	4,446	6,577	3,215
	35	55	53	71	114	114	119	169	185	184	159	183	80

*As of July 12, 2022

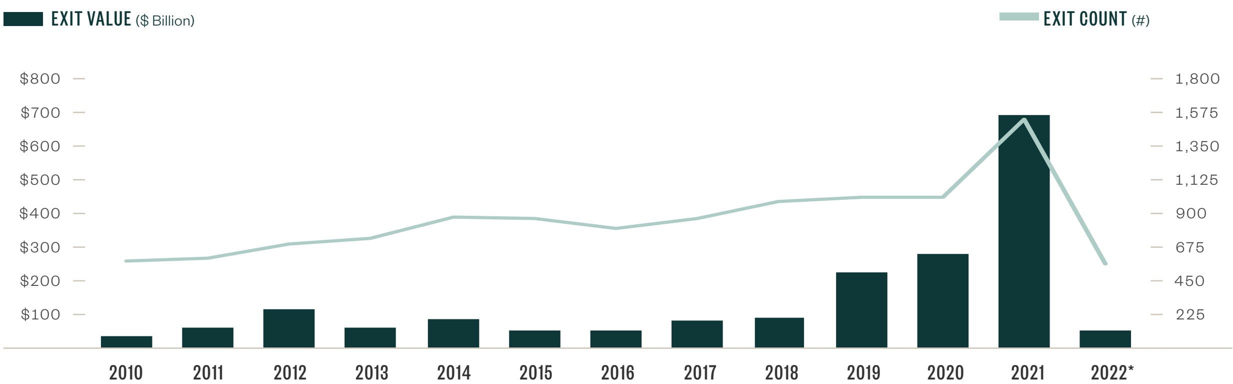
FIGURE 27: VC Deal Activity ($B) by Sector



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Commercial Products & Services	$4.0	$6.7	$5.3	$6.5	$7.8	$9.2	$7.1	$8.5	$14.4	$15.7	$16.8	$36.4	$20.4
Consumer Goods & Services	$1.5	$3.3	$2.7	$3.7	$6.5	$9.3	$7.2	$11.1	$28.5	$15.3	$14.4	$29.3	$11.4
Energy	$2.7	$3.1	$2.3	$2.0	$1.5	$1.3	$1.5	$1.0	$1.4	$1.6	$2.4	$8.8	$3.0
Health Care Devices & Supplies	$0.9	$1.4	$1.4	$1.6	$2.1	$2.5	$2.5	$3.5	$3.9	$3.9	$5.2	$6.6	$3.1
Health Care Services & Systems	$1.1	$1.2	$1.6	$1.9	$3.1	$4.0	$4.5	$5.1	$7.2	$8.9	$12.0	$29.2	$8.7
IT Hardware	$3.0	$2.8	$2.5	$2.6	$2.9	$2.8	$4.1	$4.1	$5.3	$5.7	$6.3	$9.0	$5.0
Media	$0.7	$1.1	$1.0	$1.4	$1.3	$1.5	$1.3	$1.1	$0.9	$1.7	$1.2	$2.0	$1.3
Other	$0.6	$0.7	$1.1	$0.9	$2.3	$4.8	$3.8	$4.1	$6.6	$7.8	$11.3	$25.4	$8.1
Pharmaceuticals & Biotech	$0.9	$0.8	$0.7	$0.8	$1.3	$1.4	$2.2	$2.3	$5.0	$3.9	$7.6	$8.7	$5.4
Software	$8.1	$13.7	$13.1	$16.2	$26.4	$27.4	$26.5	$27.5	$39.6	$45.0	$52.7	$129.8	$56.0
Transportation	$0.4	$0.8	$0.9	$0.6	$3.6	$4.3	$9.7	$2.8	$10.4	$8.2	$9.1	$13.1	$1.6

*As of July 12, 2022

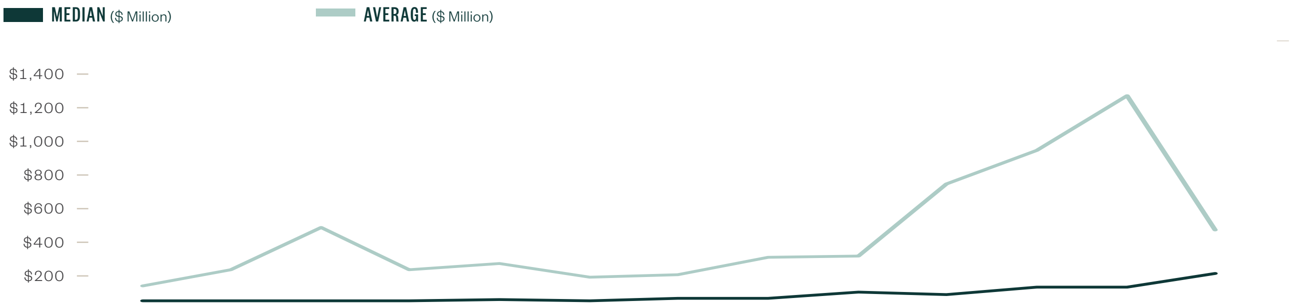
FIGURE 28: VC Exit Activity



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$30.1	$55.6	$113.1	$57.9	$84.5	$48.2	$47.9	$78.4	$89.1	$224.7	$279.4	$694.5	$48.3
COUNT	581	595	696	727	872	865	799	860	974	1,009	1,005	1,527	556

*As of July 12, 2022

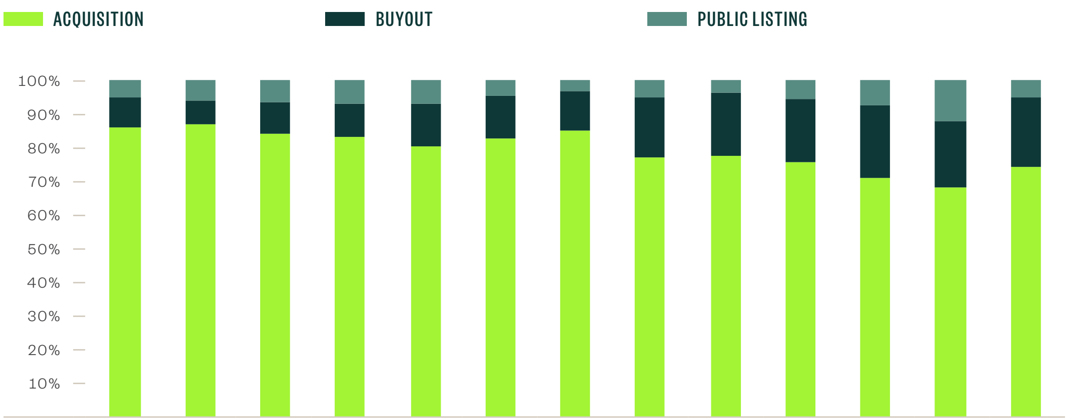
FIGURE 29: Average & Median VC Exit Size ($M)



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
MEDIAN	$50.0	$48.6	$50.1	$49.7	$54.0	$46.8	$65.0	$59.6	$96.6	$82.3	$126.0	$131.2	$210.0
AVERAGE	$134.4	$233.7	$485.6	$232.6	$272.6	$190.4	$204.0	$310.0	$318.3	$749.0	$947.0	$1,276.7	$469.1

*As of July 12, 2022

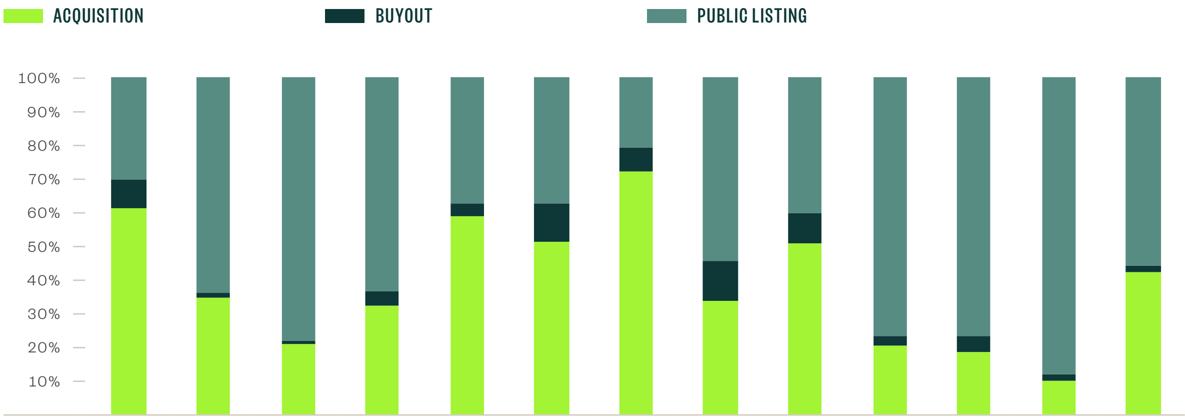
FIGURE 30: VC Exit Activity (#) by Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	501	516	585	605	702	716	679	664	753	762	711	1,038	414
	50	43	67	73	111	109	94	152	187	193	220	303	113
	30	36	44	49	59	40	26	44	34	54	74	186	29

*As of July 12, 2022

FIGURE 31: VC Exit Activity ($B) by Type



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
	$18.5	$19.4	$23.8	$18.7	$50.0	$24.7	$34.6	$26.5	$45.3	$45.9	$52.7	$71.2	$20.6
	$2.6	$0.7	$0.9	$2.5	$2.9	$5.6	$3.5	$9.3	$8.2	$6.8	$12.5	$11.5	$0.7
	$9.0	$35.5	$88.5	$36.8	$31.6	$17.9	$9.9	$42.7	$35.6	$172.0	$214.2	$611.8	$27.0

*As of July 12, 2022

The bull market in public equities throughout the 2010s both paralleled and correlated to the record surge in venture activity across technology. 2021 shattered records, with close to $300 billion invested across nearly 14,500 completed financings. Only the dot-com era was close to matching those highs.

So far in 2022, neither financing volume nor aggregate deal value strayed far from those tallies, with $124 billion invested across 6,814 transactions. However, quarterly data indicates momentum is softening slightly. As is the case with PE fund managers, venture firms are awash in capital overhang with which to fund start-ups. Hence, high financing metrics were still recorded through mid-July 2022.

Interestingly enough, in terms of volume, seed proportions also expanded slightly so far this year. This resilience at the seed stage is potentially driven by less-inflated financing metrics, thereby enabling a more consistent flow of completed rounds. However, if the rise in perceived risks continues, it's likely each stage will see financing volume diminish.

Businesses that tend to require lower levels of capital expenditure to launch or that are perceived to be less subject to recessionary fears—such as those benefiting from the tilt toward reshoring hardware and technical capabilities—could experience a more resilient influx of capital. So far, no pronounced tilt has occurred, although it's worth noting IT hardware is essentially pacing to match last year's tallies of both deal value and volume.

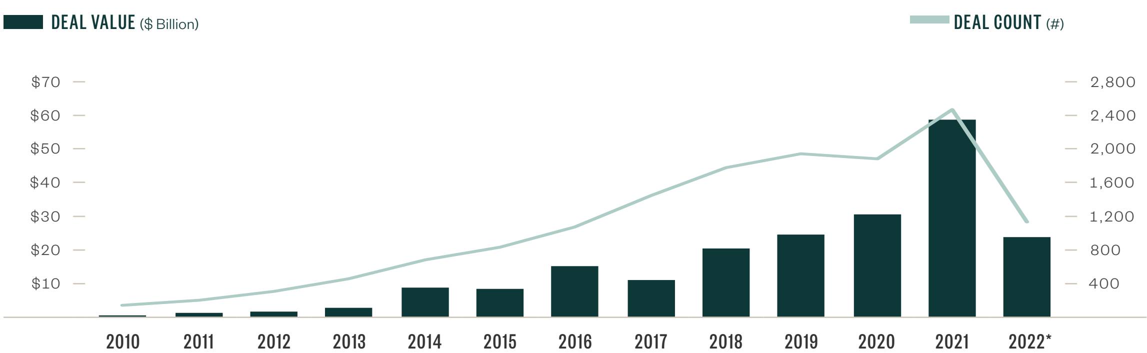
> "Clients looking to raise capital will need to have realistic forecasts and start conversations early. They will need to be able to demonstrate how they can simultaneously achieve innovation while balancing efficiency from a fiscal perspective."
>
> – Megan Hodgins

Again, much like their PE counterparts, venture firms experienced a liquidity slowdown—with one twist: venture-backed liquidity contracted to a much greater degree year-over-year. There were 556 completed exit events through mid-July 2022, for $48.3 billion in aggregate.

Although the exit count compares relatively well to historical tallies, aggregate exit value is clearly far off the highs of the past few years. In light of indications so far in 2022, liquidity prospects are likely to be murkier if the current macroenvironment persists.

SPOTLIGHT: THE RISE OF AI & ML

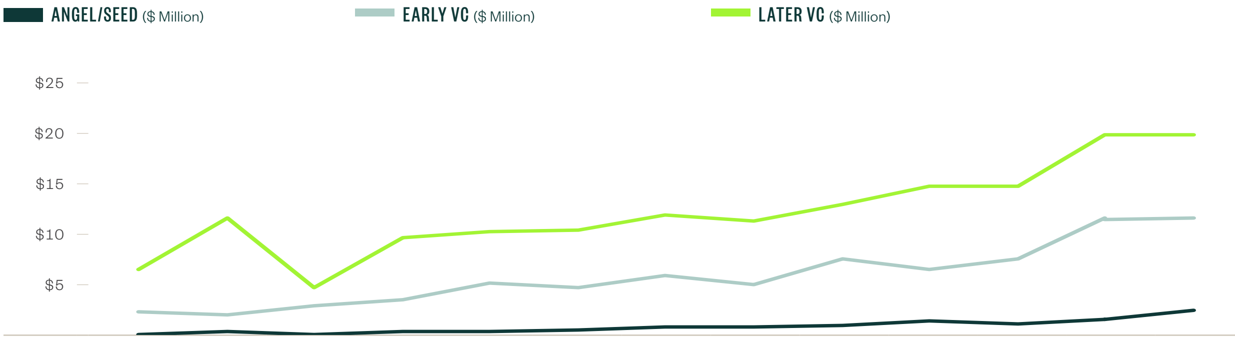
FIGURE 32: VC Deal Activity in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$0.7	$1.5	$1.5	$2.9	$8.7	$8.3	$15.3	$11.0	$20.3	$24.4	$30.5	$58.8	$23.8
COUNT	136	209	310	463	687	830	1,078	1,446	1,775	1,940	1,888	2,474	1,139

*As of July 12, 2022

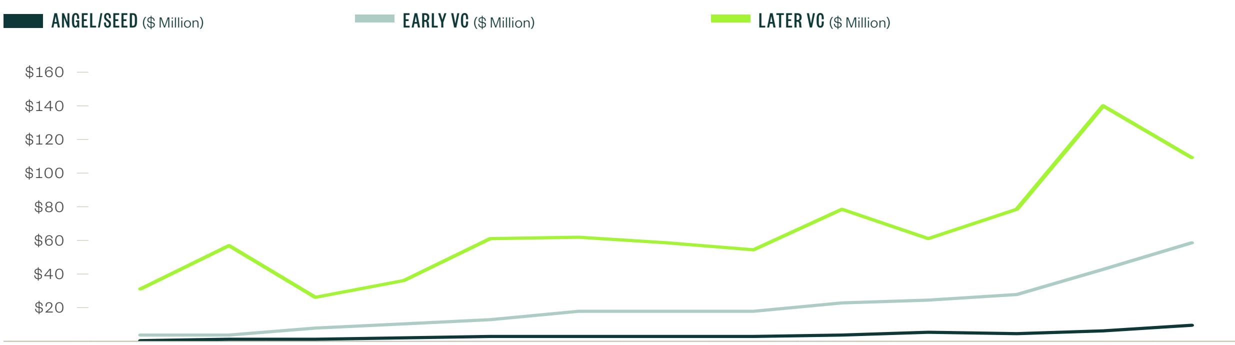
FIGURE 33: Median VC Deal Size ($M) by Stage in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
ANGEL/ SEED	$0.7	$1.0	$0.8	$1.0	$1.0	$1.1	$1.5	$1.5	$1.6	$2.0	$1.8	$2.2	$3.0
EARLY VC	$2.9	$2.5	$3.5	$4.1	$5.6	$5.2	$6.5	$5.5	$8.0	$7.0	$8.0	$11.9	$12.0
LATER VC	$7.0	$12.0	$5.2	$10.0	$10.6	$10.8	$12.2	$11.7	$13.3	$15.0	$15.0	$20.0	$20.0

*As of July 12, 2022

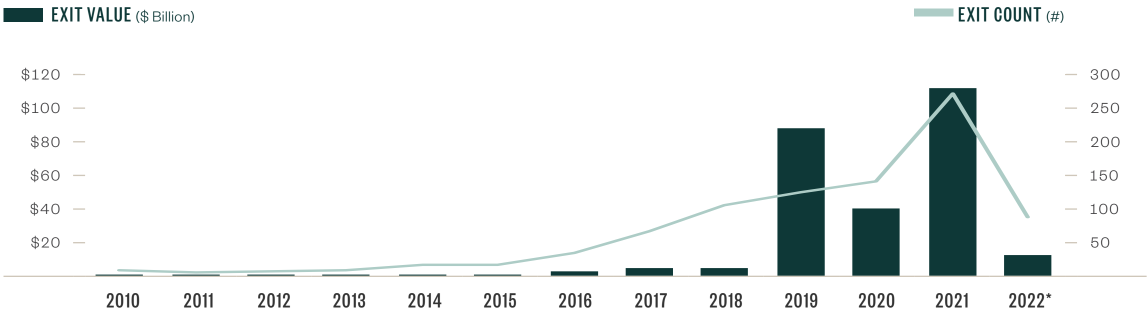
FIGURE 34: Median Pre-Money VC Valuation ($M) by Stage in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
ANGEL/ SEED	$3.4	$3.9	$4.0	$5.1	$5.4	$6.0	$5.5	$6.0	$6.2	$7.7	$7.5	$9.0	$12.0
EARLY VC	$6.5	$6.7	$10.3	$12.9	$15.5	$20.0	$19.9	$20.0	$25.0	$27.0	$30.0	$45.0	$60.5
LATER VC	$33.4	$58.3	$28.2	$38.4	$62.8	$63.2	$60.0	$56.1	$80.0	$62.5	$80.0	$140.0	$110.0

*As of July 12, 2022
Note: 2010 and 2011 metrics for the angel, seed and late stages are based on datasets where the count is less than 30.

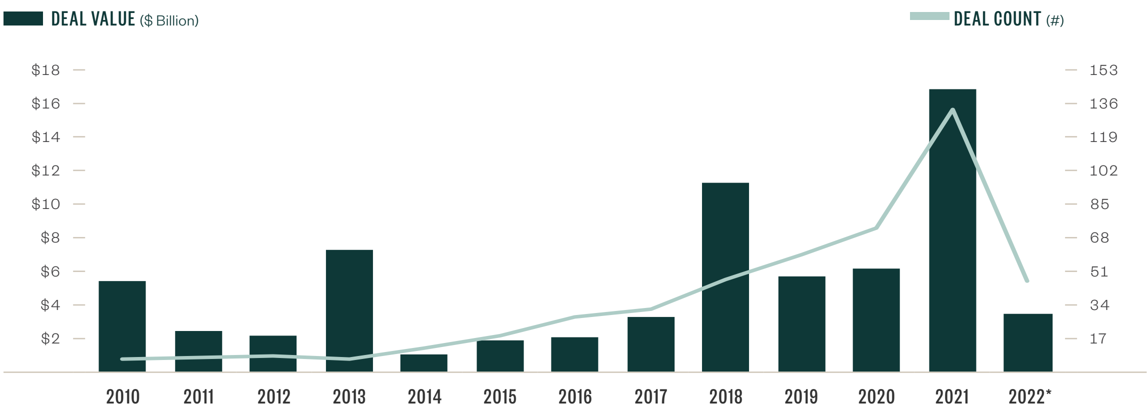
FIGURE 35: VC Exit Activity in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$0.4	$0.5	$0.3	$0.9	$0.6	$0.5	$2.7	$4.5	$4.8	$87.9	$40.2	$111.7	$12.2
COUNT	8	5	7	9	17	17	34	66	105	125	141	271	87

*As of July 12, 2022

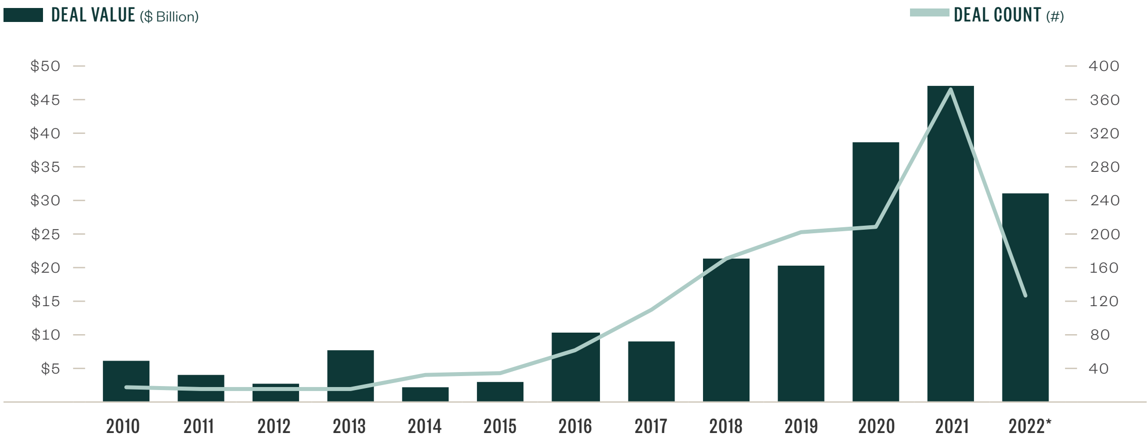
FIGURE 36: PE Deal Activity in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$5.4	$2.4	$2.1	$7.2	$1.0	$1.9	$2.1	$3.3	$11.3	$5.7	$6.2	$16.8	$3.5
COUNT	6	7	8	6	12	18	28	32	47	59	73	133	46

*As of July 12, 2022

FIGURE 37: M&A Deal Activity in AI & ML



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
VALUE	$6.0	$4.0	$2.7	$7.6	$2.1	$2.8	$10.3	$9.0	$21.4	$20.2	$38.8	$47.2	$31.1
COUNT	18	16	15	16	33	34	61	111	171	203	209	373	127

*As of July 26, 2022

Along the frontier of emerging technologies, few are as potentially complex or diversely applicable as AI and ML, which puts them among the most misunderstood verticals. As AI and ML ventured from academia decades ago, they advanced in capacity and capabilities, enabling faster computation, novel routes to predictions, better tools to aid human judgment—as opposed to replacement—vastly improved image and video processing, sophisticated data crunching, and more.

This list—though far from exhaustive—indicates why venture investment in the field grew so swiftly throughout the decade. From 830 completed transactions in 2015 for an aggregate of $8.3 billion, financing flows skyrocketed to just short of $60 billion invested across nearly 2,500 completed transactions last year.

Through mid-July, 2022 saw $23.8 billion in value across 1,139 completed transactions. Financing metrics rose commensurately, showcasing the growing economic value generated in multiple business use cases by AI and ML enterprises.

Such investment yielded a bumper crop of exits in the past few years, with the public listing frenzy in 2021 producing well over $100 billion in VC-backed exit value for companies within the sector.

Moreover, it's not just venture financing activity that surged: as AI and ML businesses matured, PE firms became active within the space, often via increasingly larger growth funding rounds, with a fair number of buyouts as well.

Strategic acquisitions continue to accelerate until recently as well, although it's worth noting that even as volume declined somewhat, deal value scarcely slid, achieving just over $30 billion in M&A so far this year.

This may be a good indicator of how dealmaking may proceed within the sector, as investment in AI and ML enterprise tools has the potential to help drive expediency and efficiency across numerous business processes. Even in a troubled economic and market environment, acquisitions of and investment in AI and ML capabilities could still be justifiable, leading to more resilient dealmaking.

SECTION FIVE

Looking Ahead

The macroeconomic and market environment may be as complex as it has ever been in the 21st century. Contradicting factors proliferate, from high inflation rates to positive consumer sentiment—at least in the United States—to slowing economic growth measurements to sky-high commodity prices to choppiness in equities.

What this entails for technology dealmaking is complex but not overly bearish, for several reasons. On the private investment firm side, both PE and VC funds currently hold a staggering amount of capital commitments, which, even if dialed back by cautious institutional allocators in coming months, should fuel dealmaking.

On the strategic side, consolidation will continue in fragmented sectors as well-prepared companies look to capitalize on market dislocation, especially in terms of valuations. It may take some time for subsiding levels of activity to plateau, given the array of troubling indicators across economic, geopolitical, and market landscapes.

That said, barring catastrophic black-swan events, investment won't crash given the need to further improve efficiencies and cement market positions—especially in key sectors such as cleantech, automation, smart manufacturing, and more. As a result, a moderated level of dealmaking across both public and private markets seems likely.

> "Looking ahead, many technology enterprises will move away from a fully remote mindset to an interpersonal hybrid model. It's likely we'll see more companies move to have certain days or blocks of time in the office focused on activities that are advantaged though in-person collaboration and those that strengthen the team, support operations, and build culture. Conversely, there will also be time scheduled out of the office for focused work on development and delivery."

– Steven Schechter

SECTION SIX

Methodology

The scope of technology was defined using a blend of relevant PitchBook verticals as well as the primary industry code of information technology. M&A deal values were extrapolated. Otherwise, PitchBook's standard methodologies for report datasets covering M&A, PE, and VC were used. Full details can be **found here**.

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