We See Exuberance Within Certain U.S. Tech Stocks

Tech is expensive overall, while a subset of names (notably Zoom and Shopify) have alarming valuations.

Morningstar Equity Research
January 11, 2021

Contents

Brian Colello
Director of Technology Equity Research
+1 312-384-3742
brian.colello@morningstar.com

Malik Ahmed Khan
Associate Equity Analyst
+1 312-244-7803
malikahmed.khan@morningstar.com

Contributing Analysts:
Abhinav Davuluri
Equity Strategist, Technology
+1 312-244-7400
abhinav.davuluri@morningstar.com

Dan Romanoff
Equity Analyst, Technology
+1 312-244-7816
dan.romanoff@morningstar.com

Mark Cash
Equity Analyst, Technology
+1 312-244-7022
mark.cash@morningstar.com

Nupur Balain
Equity Analyst, Technology
+1 312-244-7955
nupur.balain@morningstar.com

Important Disclosure
The conduct of Morningstar's analysts is governed by Code of Ethics/Code of Conduct Policy, Personal Security Trading Policy (or an equivalent of), and Investment Research Policy. For information regarding conflicts of interest, please visit: http://global.morningstar.com/equitydisclosures

Zoom, Shopify, Palantir, DocuSign, and Others Are Priced Far Beyond Our Expectations

We've received inquiries from investors regarding valuations within the U.S. Technology sector. Across our coverage, which skews toward large cap, moaty names and is centered around semis, software, and hardware, we view the sector as expensive as the median price to fair value estimate ratio sits at 1.18 as of Dec. 30, one of the highest ratios we've seen since 2007.

We would require a pullback in stock prices before we can recommend many of our names to investors with an attractive margin of safety. If we compare our coverage to the dot-com bubble (in which the NASDAQ declined 66% from 2000-2002), U.S. Tech is in a better place today. Many companies under our coverage are supported by healthy free cash flow generation. Among other names that lack GAAP profitability (mostly software), we still see firms making wise investments in sales and marketing to capture sticky customers in rapidly growing end markets in the once-in-a-generation shift toward cloud computing and software-as-a-service. If our Tech coverage does in fact crash, we suspect it would be macro-driven, not because of highly risky bets on unproven technologies that fail to gain adoption.

Nonetheless, for more than a handful of U.S. Tech names, we saw unusual price appreciation in 2020. We identified 11 companies under our coverage where the stock price rose 100%-plus while reaching at least a $20 billion market cap in 2020, meaning that the company added at least $10 billion of market value in a single year. Stocks include Coupa Software, CrowdStrike, DocuSign, Nvidia, Okta, Palantir, RingCentral, Shopify, Twilio, Zoom, and Zscaler.

These types of large moves are rare—we typically only see one or two companies receive such a massive infusion of investor dollars in a single year, and 1999 was the last time we saw more than five companies appreciate to this extent. In recent years, the market made some wise investments to pile into one or two of these stocks each year (especially FAANG). However, many investors did not fare well after 1999, which was the last time that the market rushed into more than a handful of Tech stocks.

Although we like many of these 11 businesses, we would anticipate poor outcomes for many investors buying these stocks at today's prices, most notably Zoom and Shopify. In order to come close to such valuations today, these firms not only require tremendous future growth and earnings power but also wide economic moats, whereas we are more skeptical about the ability of these firms to fend off competition. Instead, we would point investors to our Company Reports on undervalued names across our coverage (Intel, Splunk, Blackbaud, VMware) or even fairly valued bellwethers (Microsoft, Salesforce).

Companies Highlighted

Name/Ticker	Economic Moat	Moat Trend	Currency	Fair Value Estimate	Current Price	Uncertainty Rating	Morningstar Rating	Market Cap(Bil)
Coupa Software COUP	Narrow	Positive	USD	249.00	318.09	Very High	★★	24.5
CrowdStrike CRWD	Narrow	Positive	USD	162.00	208.85	High	★★	46.9
DocuSign DOCU	Narrow	Stable	USD	152.00	223.85	Very High	★★	41.5
Nvidia NVDA	Narrow	Positive	USD	340.00	504.58	Very High	★★	323.2
Okta OKTA	Narrow	Positive	USD	232.00	239.72	High	★★★	32.9
Palantir PLTR	Narrow	Positive	USD	13.00	23.54	High	★	44.2
RingCentral RNG	Narrow	Stable	USD	293.00	372.78	High	★★	34.0
Shopify SHOP	Narrow	Stable	USD	657.00	1,085.56	Very High	★	137.6
Twilio TWLO	Narrow	Positive	USD	302.00	329.01	High	★★★	54.3
Zoom Video ZM	None	Stable	USD	176.00	344.41	Very High	★	96.5
ZScaler ZS	Narrow	Positive	USD	140.00	184.42	High	★★	26.8

Key Takeaways

- We would characterize our U.S. Technology coverage, which skews toward larger-cap companies with sustainable competitive advantages, or economic moats, as overvalued. The median stock within our coverage trades at a price/fair value ratio of 1.18 as of Dec. 30, which is one of the highest ratios we've seen since 2007. In order to find investment ideas with an attractive margin of safety, we'd like to see a pullback in stock prices across many of our names.
- Compared with the dot-com bubble, however, in which the NASDAQ declined 66% from 2000-2002, U.S. Tech is in a steadier place today. Unlike in the dot-com era, semiconductor and hardware companies have fundamental earnings power to support valuations.
- Even in software, where many names do not have fundamental GAAP earnings, we think that many companies are wisely investing in sales and marketing in order to win new business during the once-in-a-generation shift to SaaS and cloud computing. Moaty software companies under our coverage have proven to us that they benefit from customer switching costs and are likely to continue to upsell and cross-sell into sticky enterprises over time.
- We see a handful of firms with astronomical valuations that go far beyond our fundamental expectations. We also see sky high price/sales multiples in the top decile and quartile of software stocks. When thinking about a "bubble," we can construct a basket of highly overvalued Tech names where valuations are exuberant and might "burst" in the future.
- In 2020, we found 11 companies under our U.S. Tech coverage where the stock price rose 100%-plus while reaching at least a $20 billion market cap, meaning that the company added at least $10 billion of market value in a single year. We have not seen so many U.S. Tech companies make this type of leap in valuation since just before the dot-com bubble in 1999.
- We believe these stocks have doubled due to favorable trends in remote working software tools, increasing investment in cloud-based cybersecurity, advancements in artificial intelligence and data center buildouts, and the once-in-a-generation shift to SaaS. We lifted our fair value estimates in 2020 as a portion of this value creation was justified with stronger-than-anticipated growth and earnings, but market prices still soared past our revised valuations.

- When one or two companies make these types of moves per year, the market often got it right (especially with FAANG stocks). Investors were wise to pile into Apple and Nvidia, for example. However, when a larger number of companies made such moves, such as in 1999, investors were not pleased with the outcome. At best, investors were far too early and it took 10-20 years for long-term fundamentals to catch up with these enormous valuations.
- Looking across these 11 overvalued names, we struggle most with current valuations for Zoom, Shopify, and Palantir, which trade at roughly 2 times our fair value estimates. We struggle to build a reasonable bull-case scenario that can justify market prices. Rather, we would need to see more than 20 years of robust earnings growth out to 2040 to justify such valuations, all while presuming market dominance without fear of competition from others.
- Several names trade about 30% higher than our fair value estimates, including Nvidia, Zscaler, Coupa, and DocuSign. We foresee strong revenue growth and earnings for these names, but these stocks would have to fire on all cylinders for a decade or longer in order for future fundamentals to justify today's stock prices.
- Several other stocks within our list are high quality and appear overvalued, but we can build a reasonable bull-case scenario to justify current prices and we'd likely be buyers on pullbacks. This list includes Twilio, RingCentral, Okta, and CrowdStrike, with the latter two boosted recently by a rosier outlook for cybersecurity spending because of a recent hack breaching a widespread number of enterprises and government entities.

Our View of the U.S. Tech Investing Landscape as We Exit 2020

2020 was a sad year in many ways, but one area where we saw no signs of disappointment was in U.S. Technology stocks under our coverage (108 names as of December). The sector significantly outperformed the broader U.S. market in 2020, and we witnessed more than a handful of stocks with significant price appreciation.

Much went right for U.S. Tech in 2020. In some cases, Tech stocks were a safe haven as enterprises did not slash their software budgets during the COVID-19 pandemic. In other cases, enterprises and consumers turned to a wave of cloud, remote working, and e-commerce technologies such as Zoom, DocuSign, Shopify, Zscaler, and others. In more cases still, software firms like Coupa and Twilio prospered from strong secular growth trends despite the pandemic. Zoom was the poster child for a counter-cyclical name, rising over 390% in 2020. Many other stocks doubled in 2020 and prices exceeded our fair value estimates.

Looking at U.S. Tech today, we see an expensive sector and we would need a pullback in stock prices before we can recommend many names to investors with an adequate margin of safety. The median price to fair value estimate ratio across our coverage sits at 1.18 as of Dec 30, one of the highest ratios we've seen since 2007.

These valuations have led investors to throw the "bubble" term around. In this context, our team's view of a sector that is 18% overvalued does not point toward a repeat of the dot-com bubble, in which the NASDAQ crashed by 66% from 2000-2002. Compared with the dot-com era, our U.S. Tech coverage is in a steadier place. Companies within our universe (particularly in semis, IT services, and mature software) generate healthy free cash flow that can support existing valuations to a large extent.

Even in software, where many names do not have fundamental GAAP earnings, we think that many companies are wisely investing in sales and marketing in order to win new business during the once-in-a-generation shift to SaaS and cloud computing. Moaty software companies under our coverage have proven to us that they benefit from customer switching costs and have sticky customers where revenue per enterprise may rise over time.

While we can't rule out any macroeconomic factors that might cause the market to crash, we're not seeing bets across our coverage on highly risky technologies that are unlikely to gain adoption and cause investments to evaporate. We also acknowledge that our analysis is limited to U.S. Tech stocks under our coverage, which skews toward larger cap, moaty names, and we are not commenting on other sub-sectors that tend to be considered "Tech-like" (electric vehicle technologies, FinTech, social media), or other asset classes (say, cryptocurrencies).

While this commentary pertains to the sector as a whole, we saw a subset of Tech names with massive stock price appreciation in 2020, well beyond the sort of price appreciation we tend to observe in a normal year. As we watched prices soar past our fundamental valuations, we asked ourselves two main questions. First, how common are these large moves in U.S. Tech equities? Second, does the market get it right to pile into these names, or do these massive market moves end poorly for investors?

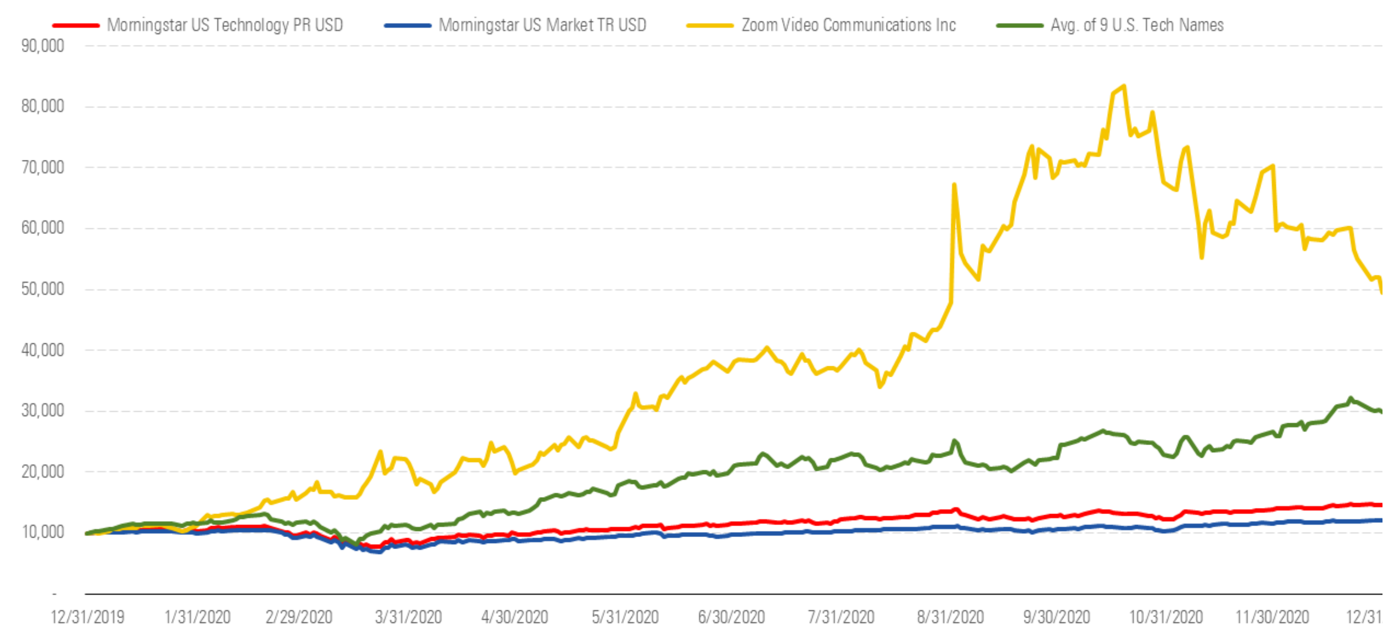
First, we identified 11 companies under our U.S. Tech coverage where the stock price rose 100%-plus while reaching at least a $20 billion market cap, meaning that the company added at least $10 billion of market value in a single year (and also strips out small caps, takeovers, and lesser-known names).

Exhibit 1 11 Companies Within Our U.S. Tech Coverage Gained 100% Plus and Exceeded $20 Billion of Market Cap

Ticker	Company Name	Price % Change	Market Cap 12/31/20 (USD b)	Moat	Moat Trend
COUP	Coupa Software	121%	24.5	Narrow	Positive
CRWD	CrowdStrike	328%	46.9	Narrow	Positive
DOCU	DocuSign	193%	41.5	Narrow	Stable
NVDA	Nvidia	118%	323.2	Narrow	Positive
OKTA	Okta	117%	32.9	Narrow	Positive
PLTR	Palantir	148%	44.2	Narrow	Positive
RNG	RingCentral	119%	34.0	Narrow	Stable
SHOP	Shopify	176%	137.4	Narrow	Stable
TWLO	Twilio	228%	54.3	Narrow	Positive
ZM	Zoom Video	391%	96.5	None	Stable
ZS	Zscaler	322%	26.8	Narrow	Positive

Source: Morningstar. Data as of Jan. 7, 2021

Exhibit 2 Several High Fliers in U.S. Tech, Notably Zoom, Far Outpaced the Broader Market



Source: Morningstar. Data as of Jan. 7, 2021. Average includes COUP, CRWD, DOCU, NVDA, OKTA, RNG, SHOP, TWLO, ZS. Excludes Palantir as it became public in September 2020.

We then looked at data going back to 1990 to see how many U.S. Tech firms made similar moves. In short, these types of moves are rare—we typically only see one or two companies receive such a large infusion of investor dollars in a single year, and 1999 was the last time we saw more than five names make similar moves.

To answer our second set of questions, we looked at how these stocks performed after investors piled into these U.S. Tech names. In general, the market got it right a reasonable number of times, especially in recent years and if we expand our search slightly to include all of the FAANG names (Facebook, Amazon, Apple, Netflix, Google). Ultimately, future revenue growth and earnings potential justified such moves.

However, the last time we saw more than a handful of names receive such an infusion of investor dollars, it was 1999, just before the dot-com crash. The outcome was not pretty for investors thereafter. In a best-case scenario, if investors held those stocks until today, they would have been about 10-20 years too early in terms of witnessing long-term fundamental revenue and earnings growth that justified these enormous valuations in 1999.

Looking at these 11 stocks today, we like all of these businesses as we award 10 of them with narrow moats (Zoom is the exception with a no-moat rating) and award many of these stocks with positive moat trend ratings. We are seeing strong growth prospects for these firms in large potential end markets, and we would not hesitate to recommend these names if valuations were more reasonable.

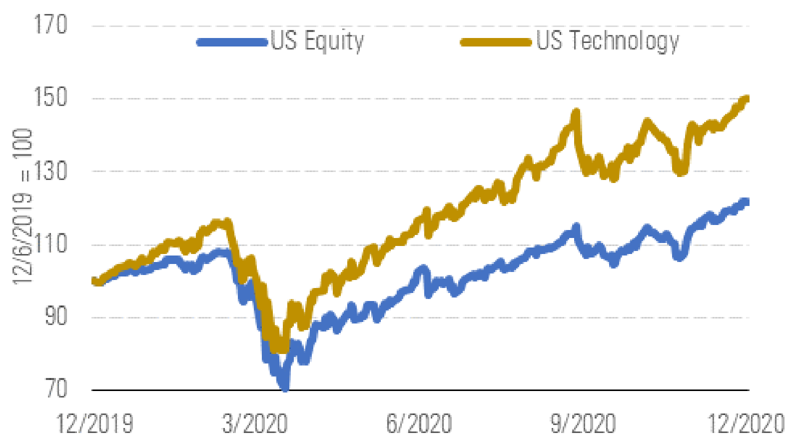
On the other hand, based on today's prices, we would anticipate poor outcomes for many investors, most notably Zoom and Shopify. In order to come close to such valuations today, these firms not only require tremendous future growth and earnings power but also wide economic moats, whereas we are more skeptical about the ability of these firms to fend off competition. Most of these companies have to emerge as powerhouses as far out as 2040 to justify current prices.

Ultimately, we would steer investment dollars away from these 11 high fliers. We acknowledge that we don't have many long investment ideas within the U.S. Tech sector at the moment. Since the sector is relatively expensive, we would instead point investors to our company reports on our remaining handful of undervalued names (Intel, Splunk, Blackbaud, VMware) or even fairly valued wide-moat bellwethers (Microsoft, Salesforce).

What Went Right for Technology in 2020

In a difficult year for most people and many companies large and small, 2020 was a banner year for Technology investors. As of Dec. 7, the Morningstar U.S. Technology Index was up a whopping 43.3% on a trailing 12-month basis, vastly outperforming the U.S. equity market, which is up 18.4% on a TTM basis. As shown in Exhibit 3 below, U.S. Technology was an outperformer during both the COVID-19-related market sell-off in March 2020 and the subsequent market recovery.

Exhibit 3 Tech Outperformed the Broader Market in Both the COVID-19 Sell-Off and Rebound



Source: Morningstar. Data as of Dec. 7, 2020

Ultimately, we think Tech in 2020 could be viewed as all things to all investors—both a safe haven and a sector with strong secular growth. First, during the depths of the downturn, Tech was considered by many to be a safe haven and we'd concur with this view. As we wrote in our April 2020 special report, "COVID-19 Fear Creates Rare Opportunity for Software Investors," we did not anticipate deteriorating fundamentals at wide-moat software names such as Microsoft, ServiceNow, Salesforce, or Tyler Technologies, among others. These moaty software names have sticky customer bases and healthy deferred revenue balances with excellent visibility and were still poised to expand within their cohorts of existing customers. As the world shifted to remote working, we were highly skeptical that enterprises would start slashing their software budgets, giving their workers fewer tools and adding workflow disruptions to their daily businesses. White collar workers didn't stop using Office 365 during the pandemic, sales representatives didn't abandon Salesforce, HR professionals didn't cut back on their usage of Workday, etc. Admittedly, revenue growth and new software wins were dampened in 2020 versus our expectations at the start of the year, but the software sector fared far better than many other investment sectors.

Second, on the upside, secular growth drivers within Tech remained intact. The shift toward cloud computing and the outsourcing of IT workloads remained in full force during the pandemic as businesses strived to keep up with a more flexible workforce and changing world. Microsoft Azure, for one, continues to perform well with 48% year-over-year growth in the third quarter of 2020, for example.

Third, the shift to remote working led to a near-term boost in IT spend within enterprises, as companies raced to equip their employees with newer PCs, monitors, and peripherals. Similarly, data center spending, especially within the cloud, remained robust. This accelerated refresh cycle won't last forever (and it may have already reverted back to the mean), but it led to some decent results within semiconductors and hardware.

Fourth, and perhaps most notable, were Tech names that were counter cyclical to the pandemic and appear poised to be winners in the "new working world" once the pandemic subsides. Zoom was the big winner here with the stock rising 391% in 2020 and making massive moves on days when the market was most panicked. A good portion of this move was justified. In Zoom's first quarter, we wrote that Zoom reported one of the greatest quarters in the history of the software sector and we stand by this comment. It isn't every day that revenue grows 169% year over year, and the firm reported $328 million of revenue versus CapIQ consensus of $202 million and the company's own guidance of $200 million. DocuSign and Shopify were other firms poised to benefit from a rise in e-commerce and fewer face-to-face interactions.

The Eleven (!!) Horsemen of U.S. Tech in 2020

Thanks to these trends, many U.S. Tech stocks not only outperformed the broader market in 2020 but appreciated in eye-popping fashion. We identified 11 stocks within our U.S. Technology universe that rose more than 100% in 2020 while adding $10 billion or more of market capitalization. We think the latter criteria is important—these companies weren't taken over or popped based on a single customer or design win, rather, they received a significant inflow of capital. The market has given these 11 stocks some credibility regarding their future outlooks.

We would put these stocks into three broad categories, along with a couple of other outliers:

1. The Acceleration of Remote Working and Online Everything—Zoom, RingCentral, DocuSign, Shopify, Twilio

In a world where everything moved remotely, several names were countercyclical to the market and beneficiaries of the online trend. Zoom's video communications are now a part of the daily lexicon as it seems as if everyone partakes in Zoom calls either for business or pleasure in 2020. RingCentral's Unified Communications as a Service (UCaaS) replaces the physical office phone with a virtual solution that can be accessed from anywhere. DocuSign is a leader in eSignatures, which remains an obvious use case to us as it replaces the tedious nature of shipping, signing, and reshipping paper documents. Shopify's e-commerce tools were vital to retailers, large and small, during the pandemic. Twilio's focus on customer engagement was critical as enterprises strived to interact with customers in new ways during the year. For example, Twilio's platform may have been the backbone to providing consumers with text alerts that their curbside orders are ready for pickup.

In each of these cases, we anticipated strong growth for these firms in the decade ahead. But in a quote from Vladimir Lenin that we heard quite often in 2020, "there are weeks where decades happen," and gradual shifts toward these technologies turned into a mad rush to shift virtually.

2. The Rush for Cloud-Based Cybersecurity—Okta, CrowdStrike, Zscaler

As we wrote in our July 2020 special report "Seeking (Cyber)Security in Uncertain Times," the rise of remote working led to more employees accessing more enterprise tools from a far wider variety of locations. All the while, cybersecurity threats during the pandemic were on the rise. Adoption of cloud-based security tools from Okta, CrowdStrike, and Zscaler, in particular, accelerated during the pandemic, and we do not expect this trend to revert after workers return to offices.

3. Ongoing Secular Strength in SaaS and a Year of Beat-and-Raises—Twilio, Coupa Software

The rise of cloud computing and software-as-a-service (SaaS) continues to be the strongest secular trend within Technology, and COVID-19 did nothing to abate these tailwinds. Regardless of where employees worked, more and more enterprises became reliant on a greater assortment of cloud-based software tools. Twilio and Coupa were shining examples of this theme in 2020. Twilio's importance during COVID-19 was mentioned above. Coupa's software helps enterprises streamline their spending on indirect expenses, and belt tightening during COVID-19 likely made Coupa's platform all the more attractive.

Outside of these three themes, we have a couple of one-off, high fliers. Palantir became public in September 2020, and after a rough start, investor dollars flooded the offering. We were on the high side of Street targets with a $13 fair value estimate in September, as noted in our special report, "Peering Into Narrow-Moat Palantir's Data Market Disruption." Yet the stock rose 167% in the month of November alone, from the $10.50 range to the high $20 range.

Finally, Nvidia is a stock that not only landed on this list of 100%-plus, $20 billion-plus Tech companies in 2020 (and in prior years as well), the rise of its best-of-breed GPUs, or graphics processor units, continues. Nvidia remains well positioned to supply server GPUs for accelerating the training of artificial intelligence models and was well exposed to rising data center spending in 2020. Meanwhile, the firm leveraged its high stock price to make a wise strategic deal (still pending) to acquire ARM Holdings, which we formerly rated as a wide-moat stock when it was publicly traded several years ago.

We Haven't Sat Idle—Our Fundamental Fair Value Estimates Rose, but Market Valuations Soared Higher

Looking at our coverage of these 11 names, we certainly did not predict the opportunities caused by the COVID-19 pandemic a year ago. However, our analyst team reacted to the shifting fundamentals and reassessed our valuations of these names during 2020, leading to some sizably higher fair value estimates. Nonetheless, the market still appears far more bullish than us on these names. We're not overly bearish relative to near-term consensus estimates, but asset managers have bid these 11 stocks up to mostly unreasonable valuations and sky-high multiples.

Exhibit 4 Our Fair Value Estimates Rose Significantly in 2020, More Than Doubling on Average, as Fundamentals Improved (Red Line). Yet Stock Prices Rose Even Faster on Average, More Than Tripling

Source: Morningstar. Data as of Jan. 7, 2021
Fair value estimates and stock prices are indexed at 100 at Jan 1, 2020. Excludes Palantir

Exhibit 5 Buying Opportunities at the Start of 2020 Evaporated, While Other Names Remained Overvalued Throughout the Year….

Ticker	Company Name	P/FVE Jan 1	P/FVE Mar 30	P/FVE Jul 30	P/FVE Dec 31
COUP	Coupa	1.13	1.14	1.89	1.37
CRWD	CrowdStrike		0.86	1.38	1.30
DOCU	DocuSign		0.97	2.05	1.49
NVDA	Nvidia	1.62	1.58	2.09	1.55
OKTA	Okta		0.81	1.24	1.12
PLTR	Palantir Technologies				1.93
RNG	RingCentral	0.73	0.91	1.00	1.32
SHOP	Shopify	2.25	2.03	4.16	2.26
TWLO	Twilio	0.74	0.68	1.81	1.16
ZM	Zoom Video Comm.	1.31	2.45	2.18	2.01
ZS	Zscaler	0.86	1.09	1.76	1.44

Source: Morningstar. Data as of Jan. 7, 2021

Exhibit 6 … And Valuations Still Appear Extreme on Either a Price/Earnings Basis ….

Ticker	Company Name	Current Stock Price	Market Cap (USD m)	Street CY Adj EPS	Street Fwd Adj EPS	Current Year P/E	Fwd. P/E
COUP	Coupa Software	$ 318.09	22,959	$ 0.47	$ 0.39	670.6	822.2
CRWD	CrowdStrike	$ 208.85	46,740	$ 0.22	$ 0.32	949.5	644.2
DOCU	DocuSign	$ 223.85	41,761	$ 0.74	$ 1.11	303.6	201.7
NVDA	Nvidia	$ 504.58	312,335	$ 9.70	$ 11.57	52.0	43.6
OKTA	Okta	$ 239.72	31,036	$ 0.04	$ (0.03)	5,513.0	(9,505.2)
PLTR	Palantir	$ 23.54	46,197				
RNG	RingCentral	$ 372.78	33,413	$ 1.16	$ 1.52	320.5	245.6
SHOP	Shopify	$ 1,085.56	134,701	$ 3.73	$ 4.98	291.3	217.9
TWLO	Twilio	$ 329.01	52,800	$ 0.10	$ 0.55	3,322.3	599.6
ZM	Zoom Video	$ 344.41	98,504	$ 2.91	$ 2.96	118.5	116.3
ZS	Zscaler	$ 184.42	25,963	$ 0.38	$ 0.59	484.3	314.3

Source: Morningstar. Data as of Jan. 7, 2021

Exhibit 7 … Or a Price/Sales Basis….

Ticker	Company Name	Current Stock Price	Market Cap (USD m)	Street CY Revenue	Street Fwd Revenue	Current Year Price/Sales	Fwd. Price/Sales
COUP	Coupa Software	$ 318.09	$ 22,959	$ 525	$ 667	43.8	34.4
CRWD	CrowdStrike	$ 208.85	$ 46,740	$ 859	$ 1,193	54.4	39.2
DOCU	DocuSign	$ 223.85	$ 41,761	$ 1,430	$ 1,890	29.2	22.1
NVDA	Nvidia	$ 504.58	$ 312,335	$ 16,483	$ 19,668	18.9	15.9
OKTA	Okta	$ 239.72	$ 31,036	$ 822	$ 1,069	37.7	29.0
PLTR	Palantir	$ 23.54	$ 46,197				
RNG	RingCentral	$ 372.78	$ 33,413	$ 1,434	$ 1,772	23.3	18.9
SHOP	Shopify	$ 1,085.56	$ 134,701	$ 3,875	$ 5,388	34.8	25.0
TWLO	Twilio	$ 329.01	$ 52,800	$ 2,188	$ 2,817	24.1	18.7
ZM	Zoom Video	$ 344.41	$ 98,504	$ 2,583	$ 3,507	38.1	28.1
ZS	Zscaler	$ 184.42	$ 25,963	$ 611	$ 798	42.5	32.5

Source: Morningstar. Data as of Jan. 7, 2021

Exhibit 8 …And We're Not Far Off From Near-Term Consensus Estimates

Ticker	Street CY Adj EPS	Street Fwd Adj EPS	MORN CY Adj EPS	MORN Fwd Adj EPS	Street CY Revenue ($m)	Street Fwd Revenue ($m)	MORN CY Revenue ($m)	MORN Fwd Revenue ($m)
COUP	$ 0.47	$ 0.39	$ 0.48	$ 0.63	$ 525	$ 667	$ 524	$ 690
CRWD	$ 0.22	$ 0.32	$ 0.23	$ 0.66	$ 859	$ 1,193	$ 865	$ 1,400
DOCU	$ 0.74	$ 1.11	$ 0.76	$ 1.21	$ 1,430	$ 1,890	$ 1,433	$ 1,868
NVDA	$ 9.70	$ 11.57	$ 10.31	$ 11.08	$ 16,483	$ 19,668	$ 16,544	$ 19,288
OKTA	$ 0.04	$ (0.03)	$ 0.07	$ 0.21	$ 822	$ 1,069	$ 828	$ 1,155
PLTR			$ 0.11	$ 0.13			$ 1,073	$ 1,450
RNG	$ 1.16	$ 1.52	$ 0.97	$ 1.32	$ 1,434	$ 1,772	$ 1,168	$ 1,467
SHOP	$ 3.73	$ 4.98	$ 4.26	$ 3.02	$ 3,875	$ 5,388	$ 2,845	$ 3,594
TWLO	$ 0.10	$ 0.55	$ 0.12	$ 0.34	$ 2,188	$ 2,817	$ 1,673	$ 2,433
ZM	$ 2.91	$ 2.96	$ 2.94	$ 2.99	$ 2,583	$ 3,507	$ 2,585	$ 3,282
ZS	$ 0.38	$ 0.59	$ 0.47	$ 0.81	$ 611	$ 798	$ 626	$ 845

Source: Morningstar. Data as of Jan. 7, 2021

How Common Is the Zoom Move? A Look at Historical U.S. Tech Performance

Looking at Zoom in particular and the massive appreciation of these 11 stocks in general, we asked ourselves two main questions. First, how rare (or common) are these types of moves? And second, and perhaps more important, does the market generally get it right, or do these moves fail to pan out and lead to outcomes that are far worse, such as vaporware and bankruptcies?

Our Search Methodology for Large Cap Tech Moves

We began our search by looking at companies within the U.S. Technology and Communications Services sectors that at least doubled their market price (100% plus) in 2020 on a year-to-date basis while adding $10 billion or more to their market cap, thus exiting the year with a $20 billion-plus valuation. This $20 billion threshold eliminates small cap names that might double based on a single customer win, M&A, surviving bankruptcy, or some other newsworthy item. We then ran the same analysis for each year from 1990 to 2019.

Our industry classifications are based on Morningstar's Global Equity Classification Structure (GECS) codes. We added Communications Services to gauge the rise of stocks in media or social media that are often characterized as Tech (i.e., firms like Google, Facebook, Netflix, and others), as it was unclear to us initially whether Tech in the form of software, semis, or hardware had these types of big moves at all. Several other stocks appeared within our search that are technically Tech stocks per GECS but are not covered by our U.S. Technology team—Square and Zillow Group are two such examples. Finally, we also ran a similar search using S&P's Global Industry Classification Standard (GICS) codes. We found similar results to our GECS search, although Amazon is included in Tech per GICS (but not GECS) and is a notable example of a company that has doubled a couple of times over the past three decades.

Full, unedited results are in Appendix 1 at the back of this report. Once we determined that U.S. Tech had enough of a track record on its own, we then stripped out Communications Services stocks, with results in Appendix 2. We then narrowed the search further to include only U.S. Technology companies that are either within our coverage today or were covered by our sector team in the past (and/or would be covered by our team in the future if we were to resume coverage). Here are the full results:

Exhibit 9 U.S. Tech Stocks With >= 100% 1 Year Price Change and >= $20 Billion in Market Cap Since 1995

Year	Ticker	Company Name	Price % Change YTD	Market Cap (USD m)	Current Stock Price	Market Cap Today (USD m)	Market Cap CAGR Growth
1995	CSCO	Cisco Systems (NAS: CSCO)	112.4	20,604	$ 44.40	187,613	9.2%
1996	INTC	Intel (NAS: INTC)	130.7	107,505	$ 51.10	209,408	2.8%
1998	CSCO	Cisco Systems (NAS: CSCO)	149.7	146,000	$ 44.40	187,613	1.1%
1998	DELL	Dell EMC	203.2	41,899	$ 74.07	55,081	1.3%
1998	MSFT	Microsoft (NAS: MSFT)	114.6	348,107	$ 212.25	1,604,715	7.2%
1998		Sun Microsystems (ORCL)	114.7	32,648			
1999	AMAT	Applied Materials (NAS: AMAT)	196.8	48,479	$ 90.83	83,050	2.6%
1999	CSCO	Cisco Systems (NAS: CSCO)	130.8	355,123	$ 44.40	187,613	-3.0%
1999	GLW	Corning (NYS: GLW)	186.5	31,641	$ 36.90	28,192	-0.5%
1999	DELL	Dell EMC	162.6	113,540	$ 74.07	55,081	-3.4%
1999		Gateway (Acer)	181.6	22,551			
1999	MSI	Motorola Solutions (NYS: MSI)	141.2	90,235	$ 170.68	28,934	-5.3%
1999		Nortel Networks	304.0	139,093			
1999	ORCL	Oracle (NYS: ORCL)	289.8	158,096	$ 62.57	184,208	0.7%
1999	QCOM	Qualcomm (NAS: QCOM)	2,618.8	124,739	$ 151.19	170,996	1.5%
1999		Solectron (Flex)	104.7	28,189			
1999		Sun Microsystems (ORCL)	261.7	135,281			
1999	TXN	Texas Instruments (NAS: TXN)	125.7	78,546	$ 164.22	150,744	3.2%
1999	VIAV	Viavi Solutions (NAS: VIAV)	830.1	57,447	$ 15.29	3,501	-12.5%
2000		Applied Micro Circuits (Macom)	135.9	22,188			
2000		Brocade Communication (AVGO)	107.5	20,560			
2000	CHKP	Check Point Software (NAS: CHKP)	168.8	40,588	$ 126.42	17,724	-4.1%
2000	CIEN	Ciena (NYS: CIEN)	182.6	23,281	$ 51.45	7,952	-5.2%
2000	JNPR	Juniper Networks (NYS: JNPR)	122.5	40,032	$ 23.58	7,775	-7.9%
2003	DELL	Dell EMC	110.4	31,198	$ 74.07	55,081	3.4%
2003	INTC	Intel (NAS: INTC)	105.8	207,908	$ 51.10	209,408	0.0%
2003		SAP (ETR: SAP)	110.9	52,891	$ 129.74	154,860	6.5%
2004	AAPL	Apple (NAS: AAPL)	201.4	26,053	$ 126.60	2,129,825	31.7%
2005	AAPL	Apple (NAS: AAPL)	123.3	60,587	$ 126.60	2,129,825	26.8%
2007	AAPL	Apple (NAS: AAPL)	133.5	174,039	$ 126.60	2,129,825	21.2%
2007	TSE:BB	Blackberry (TSE: BB)	166.8	63,765	$ 6.72	3,776	-19.5%
2009	AAPL	Apple (NAS: AAPL)	146.9	190,983	$ 126.60	2,129,825	24.5%
2009	GLW	Corning (NYS: GLW)	102.6	29,988	$ 36.90	28,192	-0.6%
2009	INFY	Infosys (NSE: INFY)	137.6	31,931	$ 17.47	74,133	8.0%
2009	WIT	Wipro (BOM: 507685)	187.3	21,409	$ 6.07	31,546	3.6%
2010	VMW	VMware (NYS: VMW)	109.8	36,844	$ 139.39	58,513	4.7%
2013	MU	Micron Technology (NAS: MU)	243.1	22,999	$ 77.11	86,125	20.8%
2013	NYS:NOK	Nokia (HEL: NOKIA)	106.5	30,097	$ 4.04	22,146	-4.3%
2016	NVDA	Nvidia (NAS: NVDA)	223.9	57,533	$ 504.58	312,335	52.6%
2019	AMD	Advanced Micro Devices (NAS: AMD)	148.4	53,522	$ 90.33	108,764	103.2%
2019	LRCX	Lam Research (NAS: LRCX)	114.7	42,421	$ 496.49	71,499	68.5%
2019	SHOP	Shopify (TSE: SHOP)	185.2	45,806	$ 1,085.56	134,701	194.1%

Source: Morningstar. Data as of Jan. 7, 2021

These Types of Massive Moves Are Rare, Except in the Dot-Com Bubble

As shown in Exhibit 9, we discovered 42 instances of large moves among U.S. Tech stocks in the 29 years from 1990 to 2019, as compared with 11 such moves in 2020 alone.

If we were to make the argument for a bubble, we would start with the evidence that 11 moves in a single year is the most in any one year since 1999, while the outcomes for most investors that year did not fare well. Similarly, if we strip out 2009, a year in which the stock market started to broadly recover from the credit crisis, so that we are excluding both the dot-com bubble and credit crisis, we note only 14 instances of such moves from 2001 to 2019. Thus, a year with 11 such moves is highly unusual, but then again, 2020 was a highly unusual year for most of us. Nonetheless, we simply don't see such a massive rotation of capital into U.S. Tech stocks this often.

How Did Investors Fare? So-So, Depending on the Entry Point and Time Frame

After running our search for these massive stock moves, we then brought in current stock prices and market caps to see where these companies stood today. Were investors wise to pile into these U.S. Tech growth names when they did? Did the secular growth drivers and/or a compelling narrative actually play out for investors?

In general, we see several tech titans where the market was absolutely right about the future power of the company in question. However, if investors bought all these names at the end of each year after their massive moves, the future returns would have been rather ugly.

As shown in Exhibit 9, we looked at the current market cap of each stock today compared with the market cap as it exited its year of excellent stock performance. If we use 7% as a hurdle rate or desired return on equity, we find that only 11 investments out of 42 would have generated excess returns over time, and only eight investments out of 39 if we strip out stocks that had stellar years in 2019 and thus don't have a long enough track record to prove whether their excellent performance in 2019 was warranted or a mirage. Further, only five companies make the cut as Apple counts four (!!) times in our analysis.

The outperformers are stocks you might expect. One would have been wise to have bought Cisco Systems in 1995 at a $20.6 billion market cap, even after the stock rose 112% that year. Investors would have generated a 9.3% average return, even after the firm crashed from a $500 billion-plus market cap during the dot-com bubble in 1999 and now resides at "only" a $189 billion market cap today. That said, it would have been a poor bet to have bought Cisco on Dec. 31, 1999, at a $355 billion market cap, so timing and valuation matters.

Apple counts four different times in our rankings, as investors were wise to buy the stock during the rise of the iPod in 2004 ($26 billion market cap) and 2005 (doubling again to $60.6 billion), the introduction of the iPhone in 2007 (doubling to $174 billion), and buying the dip in 2009 after the credit crisis (doubling off of a bottom, back up to $191 billion). This all compares with Apple's $2.2 trillion market cap today.

Microsoft in 1998 ($348 billion market cap) was another stock worth riding out through the dot-com bubble with a 7% average annual return over the past 22 years. Micron was worth buying in 2013 at a $23 billion market cap as the memory chipmaker continues to ride the various industry cycles from tops to bottoms to tops again (our fair value estimate sits at $50, or $55 billion in equity value). Nvidia's stock tripled in 2016 to $57.5 billion and the move was warranted compared with where our fair value estimate sits for the stock today ($340, or a $210 billion total equity value). Nvidia has doubled again in 2020 to a $323 billion market cap at the end of 2020, but as we'll explain later, we think this move is a bit unwarranted.

If we extend our search to communications services names, we see strong, warranted performance at Facebook, Google, and Netflix (particularly in its earlier years), among others. Similarly, using the GICS code, Amazon was a repeat company with several years of excellent performance.

Finally, we ran a similar screen of how investors fared if they bought these stocks at the beginning of their massive moves (i.e., on Jan. 1 rather than Dec. 31) and held them until today. Even with the significant head start of buying a stock that rose 100%-plus in its first year, these investments were still a 50/50 proposition for investors, with 19 out of 39 exceeding a 7% hurdle rate from the time of investment until today. Since 2001, some of the more notable laggards were Intel (if acquired at the start of 2003), BlackBerry, Nokia, and Corning. Of course, this analysis excludes the potential for investors to exit their positions and reinvest elsewhere, while also excluding the inevitable rise and fall of certain technologies (such as Nokia flip phones or BlackBerry handsets or PCs with Intel processors).

Summing it up, big bets on the FAANG stocks were the right move for investors (at least as of today). Also, investors got it right more than they got it wrong in recent years, again betting on FAANG but also in names like Nvidia and Micron. For most other Tech and Tech-like stocks, the outcomes were not that great, although again, technology trends may have come and gone over this 30-year time frame.

Exhibit 10 Even When Investing at the Start of the Year With a 100%+ Move, Excess Returns Are Not a Guarantee

Year	Ticker	Company Name	Price % Change YTD	End of Year Market Cap (USD m)	Beg of Year Market Cap (USD m)	Current Stock Price	Market Cap Today (USD m)	Beg of Year CAGR
1995	CSCO	Cisco Systems (NAS: CSCO)	112.4	20,604	9,701	$ 44.40	187,613	12.1%
1996	INTC	Intel (NAS: INTC)	130.7	107,505	46,593	$ 51.10	209,408	6.2%
1998	CSCO	Cisco Systems (NAS: CSCO)	149.7	146,000	58,465	$ 44.40	187,613	5.2%
1998	DELL	Dell EMC	203.2	41,899	13,819	$ 74.07	55,081	6.2%
1998	MSFT	Microsoft (NAS: MSFT)	114.6	348,107	162,220	$ 212.25	1,604,715	10.5%
1998		Sun Microsystems	114.7	32,648	15,205			
1999	AMAT	Applied Materials (NAS: AMAT)	196.8	48,479	16,335	$ 90.83	83,050	7.7%
1999	CSCO	Cisco Systems (NAS: CSCO)	130.8	355,123	153,839	$ 44.40	187,613	0.9%
1999	GLW	Corning (NYS: GLW)	186.5	31,641	11,043	$ 36.90	28,192	4.4%
1999	DELL	Dell EMC	162.6	113,540	43,230	$ 74.07	55,081	1.1%
1999		Gateway	181.6	22,551	8,009			
1999	MSI	Motorola Solutions (NYS: MSI)	141.2	90,235	37,418	$ 170.68	28,934	-1.2%
1999		Nortel Networks	304.0	139,093	34,429			
1999	ORCL	Oracle (NYS: ORCL)	289.8	158,096	40,562	$ 62.57	184,208	7.1%
1999	QCOM	Qualcomm (NAS: QCOM)	2,618.8	124,739	4,588	$ 151.19	170,996	17.9%
1999		Solectron	104.7	28,189	13,771			
1999		Sun Microsystems	261.7	135,281	37,399			
1999	TXN	Texas Instruments (NAS: TXN)	125.7	78,546	34,803	$ 164.22	150,744	6.9%
1999	VIAV	Viavi Solutions (NAS: VIAV)	830.1	57,447	6,177	$ 15.29	3,501	-2.5%
2000		Applied Micro Circuits	135.9	22,188	9,406			
2000		Brocade Communication Systems	107.5	20,560	9,909			
2000	CHKP	Check Point Software Technologies (I	168.8	40,588	15,099	$ 126.42	17,724	0.8%
2000	CIEN	Ciena (NYS: CIEN)	182.6	23,281	8,238	$ 51.45	7,952	-0.2%
2000	JNPR	Juniper Networks (NYS: JNPR)	122.5	40,032	17,995	$ 23.58	7,775	-3.9%
2003	DELL	Dell EMC	110.4	31,198	14,827	$ 74.07	55,081	7.6%
2003	INTC	Intel (NAS: INTC)	105.8	207,908	101,005	$ 51.10	209,408	4.1%
2003	ETR:SAP	SAP (ETR: SAP)	110.9	52,891	25,081	$ 129.74	154,860	10.6%
2004	AAPL	Apple (NAS: AAPL)	201.4	26,053	8,645	$ 126.60	2,129,825	38.3%
2005	AAPL	Apple (NAS: AAPL)	123.3	60,587	27,137	$ 126.60	2,129,825	31.3%
2007	AAPL	Apple (NAS: AAPL)	133.5	174,039	74,544	$ 126.60	2,129,825	27.1%
2007	TSE:BB	Blackberry (TSE: BB)	166.8	63,765	23,904	$ 6.72	3,776	-12.3%
2009	AAPL	Apple (NAS: AAPL)	146.9	190,983	77,352	$ 126.60	2,129,825	31.8%
2009	GLW	Corning (NYS: GLW)	102.6	29,988	14,800	$ 36.90	28,192	5.5%
2009	INFY	Infosys (NSE: INFY)	137.6	31,931	13,441	$ 17.47	74,133	15.3%
2009	WIT	Wipro (BOM: 507685)	187.3	21,409	7,451	$ 6.07	31,546	12.8%
2010	VMW	VMware (NYS: VMW)	109.8	36,844	17,562	$ 139.39	58,513	11.6%
2013	MU	Micron Technology (NAS: MU)	243.1	22,999	6,704	$ 77.11	86,125	37.6%
2013	NYS:NOK	Nokia (HEL: NOKIA)	106.5	30,097	14,577	$ 4.04	22,146	5.4%
2016	NVDA	Nvidia (NAS: NVDA)	223.9	57,533	17,765	$ 504.58	312,335	77.4%
2019	AMD	Advanced Micro Devices (NAS: AMD)	148.4	53,522	21,544	$ 90.33	108,764	124.7%
2019	LRCX	Lam Research (NAS: LRCX)	114.7	42,421	19,756	$ 496.49	71,499	90.2%
2019	SHOP	Shopify (TSE: SHOP)	185.2	45,806	16,064	$ 1,085.56	134,701	189.6%

Source: Morningstar. Data as of Jan. 7, 2021

After Many of These Moves, Especially in 1999, Investors Were Either Early or Wrong, Which Is Pretty Much the Same Thing

Looking at the rest of these stocks, we're a bit relieved that the market didn't tend to be entirely wrong with their investment theses. We believe our search captured inactive companies, but few names plummeted from $20 billion-plus all the way to bankruptcy. Nortel is a notable example in Tech, while Worldcom and Pegasus Wireless landed on the list when including Communications Services.

Predictably, most of the failures occurred in 1999 and 2000 during the dot-com bubble where valuations were not supported by underlying fundamentals. In certain cases, these stocks made for poor investments, either in business quality (Gateway or Nortel Networks) or in timing (buying Cisco at its peak).

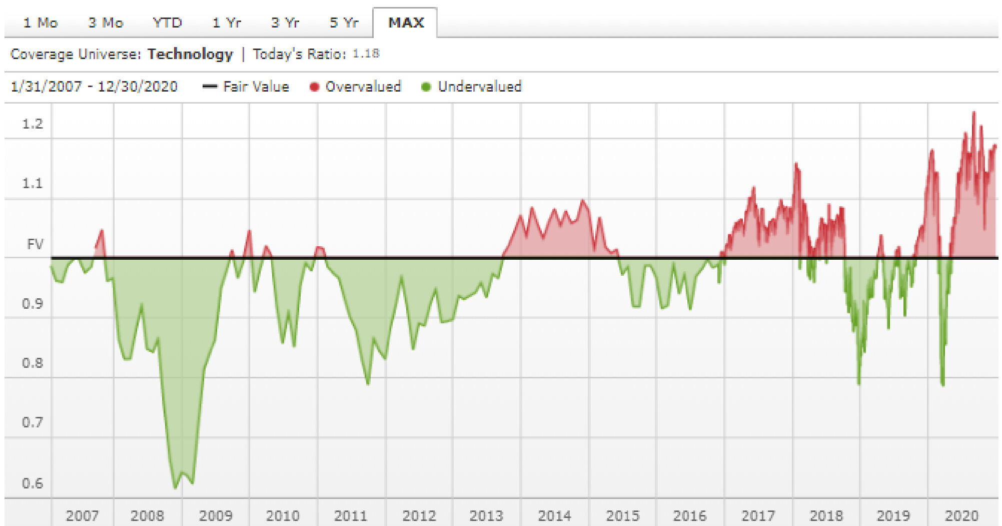
However, in several cases during the dot-com bubble, investors made the right bets on high-quality companies but simply paid quite a bit too much for these stocks and quite a bit earlier than when fundamentals emerged to support these valuations. We see high-quality, wide- and narrow-moat names on the 1999 list, such as Applied Materials, Oracle, Qualcomm, and Texas Instruments. These businesses are worth more today than in 1999, and we would characterize each of them as a strong company with the ability to generate healthy free cash flow. Average annual returns over the past 21 years would not exceed a 7% hurdle rate, though, and investors would have been better off investing elsewhere. However, the averages here might not be meaningful. Investors in these stocks in 1999 likely saw a massive fall after the dot-com bubble and would have to wait nearly two decades for stock price appreciation thereafter in order to justify any sort of investment returns at all.

As we look at the 11 high fliers within U.S. Tech in 2020, our best bet is that this same dynamic may play out. We may eventually find a time where the fundamentals of Zoom, for example, support a $100 billion-plus market cap, or Shopify at $130 billion-plus. However, this timeline might be too far out on the horizon to warrant an investment today based on current stock prices.

Where Does Tech Go From Here?

Looking at our entire U.S. Technology coverage, the median price/fair value estimate ratio sits at 1.18 as of Dec. 30. This is certainly a pricey ratio and one of the highest we've seen since 2007, and it implies that U.S. Tech is broadly overvalued. We'd welcome a correction in Tech stocks in order to provide investors with some potential buying opportunities.

Exhibit 11 The Median Price-to-Fair Value in Technology Sits at 1.18 as of Dec. 30, One of the Highest Ratios Since 2007



Source: Morningstar. Data as of Dec. 30, 2020

Since we believe that the median U.S. Tech stock is nearly 20% overvalued, we wouldn't be surprised at all if valuations were to pull back a bit at some point in time. As discussed, we think Tech provided some relative safety to investors during the turbulence of the COVID-19 pandemic, while also providing attractive growth opportunities in other areas thanks to the shift to remote working and IT upgrades. However, as the world hopefully recovers from COVID-19 in 2021 and vaccines roll out, it is possible that beaten up sectors (hospitality, airlines, etc.) could begin to recover as well, perhaps pulling investment dollars out of Tech and remote working names.

In a way, our Tech coverage appears to have fallen into two categories, almost similar to Consumer Staples and Consumer Discretionary. In Tech, we have a basket of our coverage (again, skewing larger cap and moaty) that is expensive but has fundamental earnings and well-established technological trends in its favor. In the second bucket, we have at least 11 stocks that have skyrocketed in 2020, most of which are well above our fundamental valuations. The former grouping doesn't appear prone to a massive destruction in value, similar to the dot-com bubble in 2000. The latter grouping might be, though.

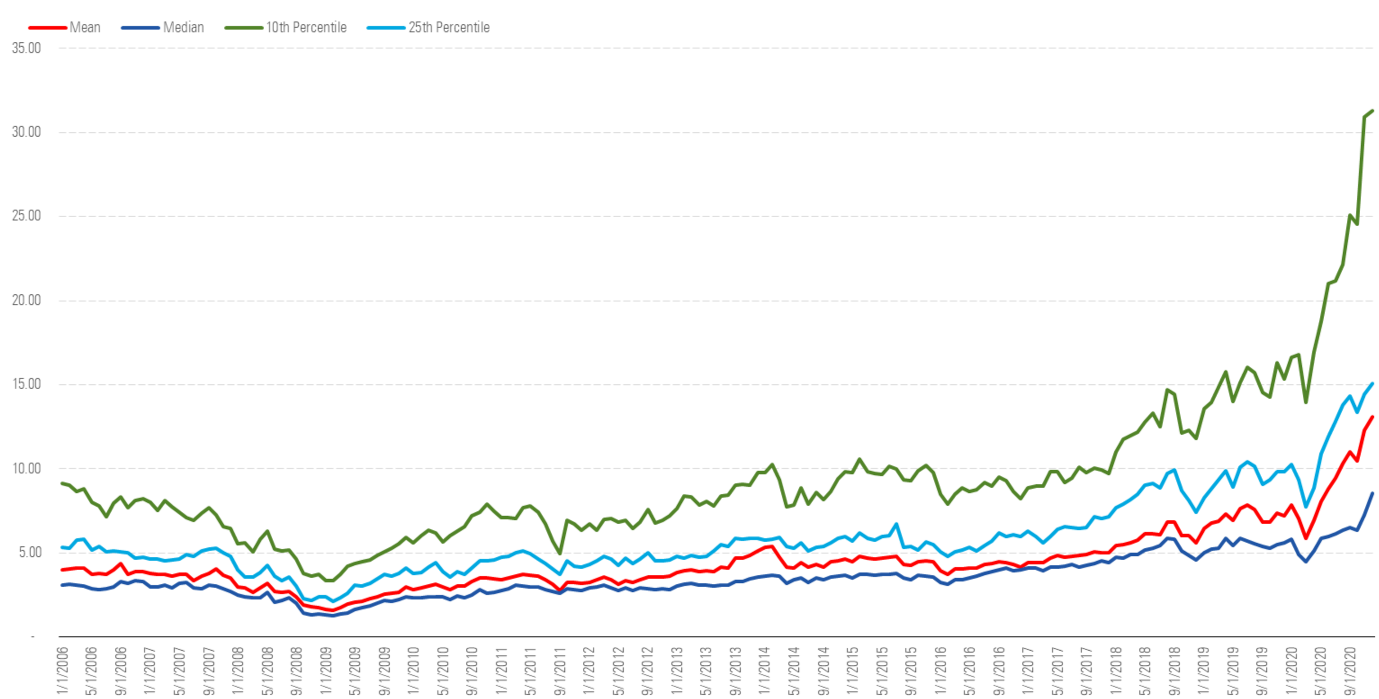
Again, it has been over 20 years since we've seen so many Tech stocks receive such large infusions of investor dollars in a single year, and this last instance was in the middle of the dot-com bubble. Looking deeper, four of these 11 stocks with a $20 billion-plus market cap have tripled in 2020, more than the number of stocks tripling or more in the past 20 years combined. Further, looking at these stocks on a fundamental basis, nine of the 11 stocks we identified are at least 30% overvalued as of the end of 2020. We'd welcome a correction broadly, but for most of these high fliers, a significant pullback wouldn't be surprising.

Software Multiples Are on the High Side

As we think about U.S. Technology valuations, software is the sub-sector where we see greater warning signs. The median price to fair value estimate ratio for software stocks under our U.S. Tech coverage sits at 1.24 as of Dec. 31, while the mean ratio sits at 1.30. These ratios indicate to us that, again, the sector is quite expensive but also not expensive enough to indicate that all software companies are doomed to crash by 60% or so.

Looking at the software sector on a price to sales basis, we see this dichotomy a bit more clearly. We ran a screen of U.S. and Canadian software stocks with a market cap in excess of $1 billion, which came up with 226 names (versus the 58 software names under our equity research coverage). As shown in Exhibit 12, multiples are at all-time highs.

Exhibit 12 Software Price/Sales Multiples Are Also Alarming, as the Richest Multiples in 2017 Are Lower Than the Mean in 2020



Source: Morningstar. Data as of Jan. 5, 2021

Looking at Exhibit 12, we note that the average P/S multiple for our software list (red line) is 13.1 times as of December 2020. This multiple is greater than the multiples for stocks within the 25th percentile (light blue) and even the 10th percentile (green) of the richest software stocks we saw in 2017. The median P/S multiple (dark blue) is about 8.6 times today, which is comparable with stocks within the 25th percentile as recently as a few years ago and in line with the P/S multiple for the top 10% of stocks in the early 2010s.

Further, we note the massive spike in the P/S multiple of stocks within the top decile. This decile includes several names we noted, such as Shopify, Coupa, Okta, Zscaler, Palantir, and DocuSign, along with some stocks outside of our coverage today like Cloudflare, DataDog, and Fasty.

On a fundamental basis, perhaps greater optimism is warranted given the COVID-19 pandemic and the rise of remote working, which has perhaps driven the need for greater software spending. Also, perhaps the understanding of SaaS economics has improved, as investors realized that the massive sales and marketing expenses incurred by unprofitable firms are likely leading to sticky implementations and successful "land and expand" strategies at leading software makers. However, we would argue that the rise in multiples may suggest that even successful software makers might fail to generate enough free cash flow in the future to justify such rich multiples today.

If we look at just this top decile of software stocks in Exhibit 12, then the multiple expansion appears to be overdone versus historical levels. Ignoring any macroeconomic considerations for the moment, perhaps this is the basket of stocks mostly likely to have its bubble "burst."

If we look at the median multiple today (dark blue), valuations appear rich but not outlandish, so a pullback might be reasonable to us but a doomsday scenario for the entire software sector seems a bit unlikely to us. Certainly, there are dreadful scenarios where we could be wrong. We're making no predictions on Central Banking policies. The COVID-19 pandemic could worsen before it improves. It's possible that U.S. corporate tax rates and overall interest rates might only rise from here. It's not entirely clear whether U.S.-China trade tensions become resolved or worsen in the months and years ahead, but a further deterioration might be possible. Thus, we concede that U.S. Tech might not merely face a correction, but something a bit worse, although this is not our base-case scenario across our sector.

Company Overviews

As we look across the 11 names we identified, we don't have a single case where these newfound valuations are fully warranted. Several of these names are overvalued, but not egregiously so, and we can build a bullish scenario with a reasonable (i.e., 25% chance) of occurring that would justify recent market prices. In several other cases, however, we struggle to justify our valuations barring a massive overhaul to our base-case assumptions.

We like many of these businesses as almost all of them warrant narrow-moat ratings, with the exception of Zoom. In each of these cases, the market has likely valued these companies as wide-moat names, anticipating excess returns on capital for 20 years or more. Based on our moat methodology, we're a bit more conservative about whether these firms will maintain their competitive advantages in order to still generate excess returns as far out as 2040.

Zoom Video Communications (Analyst: Dan Romanoff)

Zoom Video Communications says its mission is "to make video communications frictionless," which it seeks to accomplish with a unified, video-first communications platform that incorporates video, voice, chat, and content sharing. Zoom is a recognized market leader in meeting software and is disrupting and expanding the $43 billion video conferencing market with its ease of use and superior user experience. We think Zoom has product and technology advantages, but we do not believe they're enough for a moat at this stage in its life cycle.

Exhibit 13 Zoom Rose 391% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Zoom's stock was the epitome of a counter-cyclical name during the pandemic, as the rise of remote working drove businesses to adopt Zoom's video tools. In Zoom's first quarter, we wrote that the company reported one of the greatest quarters in the history of the software sector. Revenue grew 169% year over year, and the firm reported $328 million of revenue versus CapIQ consensus of $202 million and the company's own guidance of $200 million. Near-term sales only accelerated thereafter.

Exhibit 14 Zoom's Valuation Is Sky High, but the Firm Will Need to Become Dominant to Justify It, in Our Opinion

Fair Value Estimate	$	176
Share Price	$	344
Market Cap ($m)	$	98,504

Morningstar Estimates:	2021	2022	2025
Revenue	2,585	3,282	6,008
Adj. EPS	2.94	2.99	5.19
Price/Sales	38.1	30.0	16.4
Price/Earnings	117.1	115.0	66.3

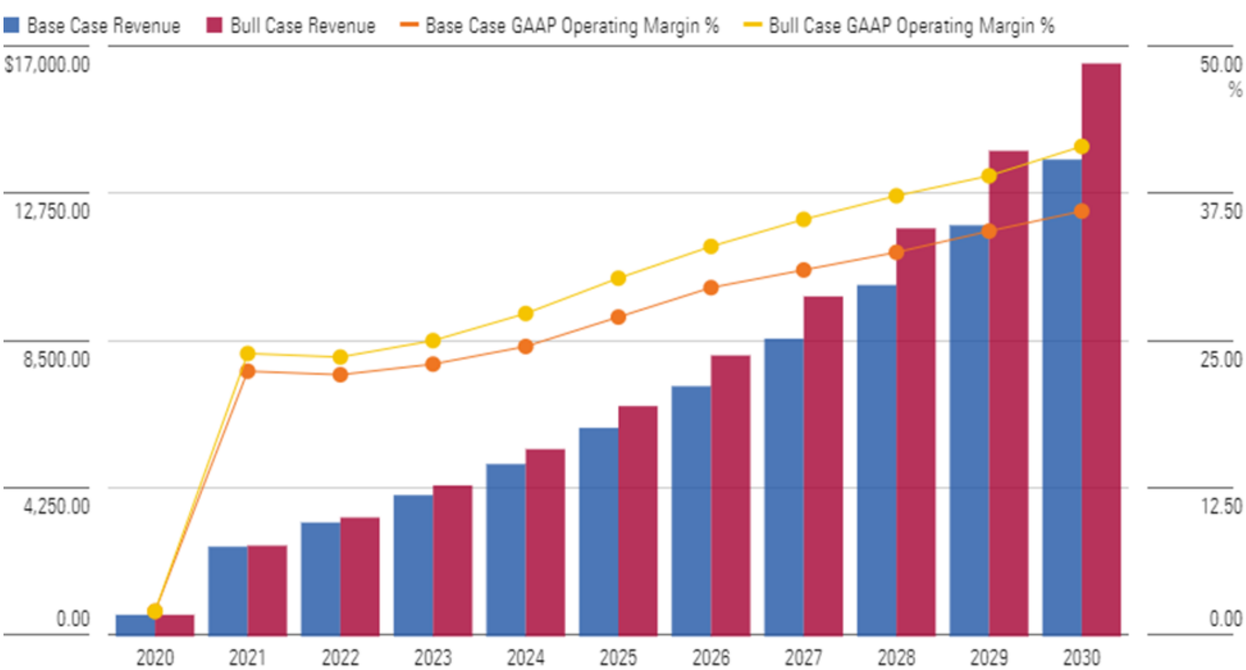
Source: Morningstar. Data as of Jan. 7, 2021

Our base-case valuation for Zoom implies total revenue growth in excess of 300% in fiscal 2021, decelerating to 21% in fiscal 2025, representing a five-year compound annual growth rate of 57%. We think revenue will shift more toward existing customers over time, and solutions beyond Zoom Meetings (Rooms, Connector, OnZoom, Zapps, and Phones) will increase within the mix. We model non-GAAP operating margin expanding from 14% in fiscal 2020 (actual) to the low 30% area in fiscal 2025 driven by scale.

Our bull-case fair value estimate is $284 per share. In this scenario, Zoom gathers new customers more quickly and benefits from more upselling, while higher revenue, in turn, falls to the bottom line more efficiently. Our five-year overall revenue CAGR is 61%, while non-GAAP operating margin expands to the mid 30% area by fiscal 2025 based on better operating leverage compared with our base case. Our bull case assumes further scale-driven operating margin expansion through the end of the discrete forecast period.

In order to support a $500 share price for Zoom (and Zoom traded as high as $589 in 2020), we need to not only assume our bullish scenario below but also assign the company with a wide economic moat. Doing so implies that Zoom will generate 20%-plus growth 20 years from now, rising to $120 billion in revenue in 2039 versus $2.6 billion in 2020, while maintaining 35% plus GAAP and adjusted operating margins. Given the competitive landscape from Microsoft Teams and others, we think such dominance is unlikely at this point in time.

Exhibit 15 Even Our Bullish Scenario for Zoom Doesn't Justify Current Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Shopify (Analyst: Dan Romanoff)

Shopify strives to be a one-stop shop for small retail businesses, especially those that are e-commerce primarily, only, or first. The company offers an e-commerce platform with a variety of related add-on functionalities, including the build-out of the Shopify Fulfillment Network, or SFN, that ultimately converge into a turnkey solution for small and midsize businesses, or SMBs. We believe the company has established a narrow moat, as switching critical e-commerce platforms has financial and operational costs for an already resource-constrained SMB. We forecast robust top-line growth benefiting from e-commerce trends over the next several years but still decelerating over time.

Exhibit 16 Shopify Rose 171% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Shopify's stock more than doubled in 2020 as its solutions became critical to a host of retailers striving to expand their e-commerce platforms during the COVID-19 pandemic.

Exhibit 17 Shopify's Valuation Is Sky High, but the Firm Will Need to Become Dominant to Justify It, in Our Opinion

Fair Value Estimate	$	496
Share Price	$	1,086
Market Cap ($m)	$	172,208

Morningstar Estimates:	2020	2021	2024
Revenue	2,845	3,594	7,950
Adj. EPS	4.26	3.02	9.17
Price/Sales	60.5	47.9	21.7
Price/Earnings	254.9	359.6	118.4

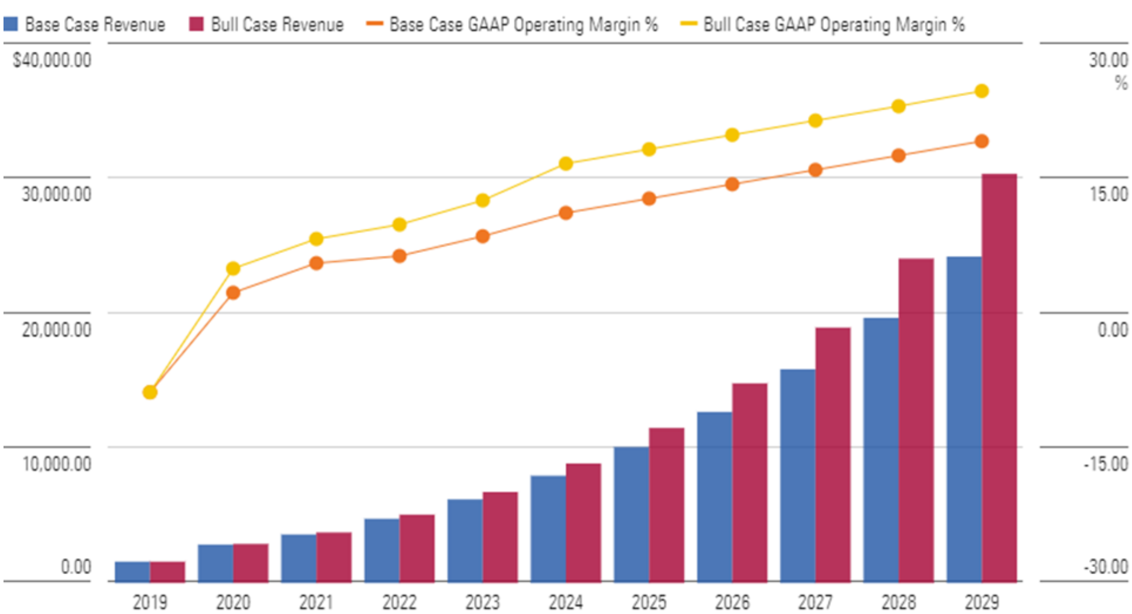
Source: Morningstar. Data as of Jan. 7, 2021

Our base-case valuation models total revenue growth of 80% in 2020, decelerating to 28% in 2024, representing a five-year compound annual growth rate of 38%. In our view, revenue growth will be driven by new merchants on the platform, uptake of the Shopify Fulfillment Network, Shopify Payments, Shopify Shipping, and Shopify Capital, and growing gross merchandise value on the platform. We also assume the introduction of unspecified new merchant solutions over time, such as more financial-related services, although we do not think this is a critical factor over the next several years. We think gross margins increase over time once the fulfillment network is scaling and contributes to leverage on operating expenses, driving the non-GAAP operating margin from 3% in 2019 to 18% in 2024 and the mid-20s range in the long run.

Our bull-case fair value estimate is $917 per share. In this scenario, Shopify signs new merchants more quickly, enjoys more rapid uptake in upselling add-on solutions to existing customers, and benefits from higher GMV flowing through the platform. Higher revenue, in turn, falls to the bottom line. Our five-year overall revenue CAGR of 41%, with non-GAAP operating margin expanding from 3% in 2019 to 23% in 2024, is driven by improved scale.

In order to support a $1,150 share price for Shopify (and Shopify traded over $1,200 at times in 2020), we need to not only assume our bullish scenario below but also assign the company with a wide economic moat. Doing so implies that Shopify will generate 20%-plus growth 20 years from now, rising to $188 billion in revenue in 2039 versus $2.9 billion in 2020, while maintaining 25%-plus GAAP and adjusted operating margins. Similarly, earnings before interest in 2039 will need to reach $34 billion, as compared with $5.8 billion in our bullish scenario in 2029 and $0.2 billion in 2020. We're hesitant to assign Shopify with a wide moat and this level of market dominance today.

Exhibit 18 Even Our Bullish Scenario for Shopify Doesn't Justify Current Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021.

Palantir Technologies (Analyst: Mark Cash)

We believe Palantir is well suited to help organizations consolidate and harness the power of data. Palantir has a leading position in the government sector with the U.S. and its allies, thanks to its Gotham software platform, which is used across various government sectors. We also see an opportunity for Palantir to expand into commercial enterprise applications with its Foundry software platform, targeting large-scale data operations. We think this narrow-moat company is poised for robust growth and margin expansion in the years ahead.

Exhibit 19 Palantir Rose 148% Since Its Direct Listing on Sept. 30 Versus the Morningstar US Technology Index of 14% and the US Market Index of 14%

Source: Pitchbook. Data as of Jan. 5, 2021.

Palantir's stock more than doubled after going public in September 2020. The direct listing went poorly at first, with the stock trading below $9 versus our $13 fair value estimate, but the stock price rallied in November. We attribute Palantir's recent meteoric share price rise to investors gaining an appreciation that the company is executing on its transformation and deserves SaaS-like comparables and expectations versus the previous notion that Palantir was a defense contractor. The company has posted some impressive contract wins in recent weeks with various end applications, and investors are potentially getting ahead of Palantir being able to top growth and margin expectations.

Exhibit 20 Unlike the Early Days of Its Direct Listing, Palantir No Longer Trades at an Attractive Valuation

Fair Value Estimate	$	13
Share Price	$	24
Market Cap ($m)	$	46,197

Morningstar Estimates:	2020	2021	2024
Revenue	1,073	1,450	3,200
Adj. EPS	0.11	0.13	0.34
Price/Sales	43.0	31.9	14.4
Price/Earnings	214.2	182.3	69.4

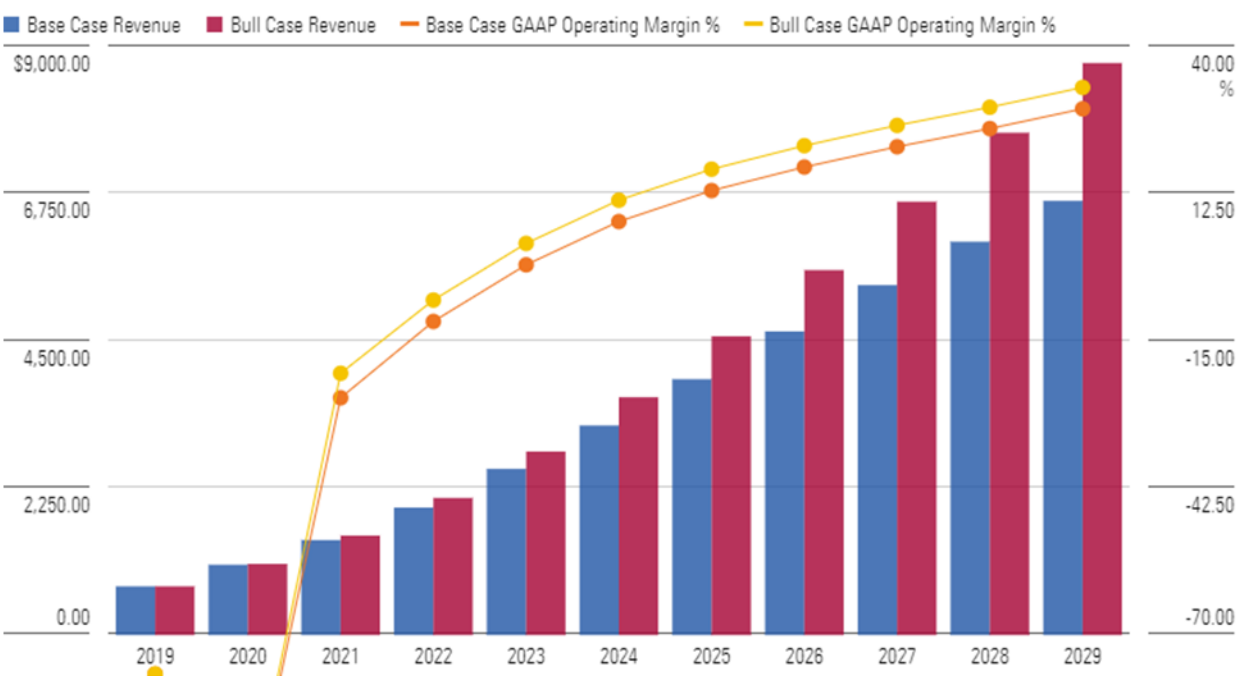
Source: Morningstar. Data as of Jan. 7, 2021

Our base-case valuation forecasts a 34% five-year revenue CAGR driven by Palantir expanding its government and commercial operations (37% and 31% CAGR in these segments, respectively). We model adjusted operating margin expanding into the mid- to high-20% range in the earlier half of the 2020 decade, compared with negative 45% in 2019.

Our bull-case fair value estimate is $18 per share. In this scenario, we expect a faster growing customer base in commercial and government markets, alongside stronger proliferation within clients. In turn, we model a 37% five-year revenue CAGR, followed by higher long-term growth rates than the base case. We anticipate gross margin expansion, and while we also model operating expenses increasing at a rapid clip, we expect greater operating leverage in this scenario where we believe the company gains increased leverage and the GAAP operating margin can expand into the low-30% range by 2029.

In order to support a $28 stock price (and Palantir traded over $33 at times in 2020), we need to not only assume our bullish scenario below but also assign the company with a wide economic moat. Doing so implies that Palantir will generate 20%-plus growth 20 years from now, rising to $54 billion in revenue in 2039 versus $8.7 billion in 2029 and $1.0 billion today, all while maintaining low-30% GAAP operating margins. For a stock that just recently reached the public markets, we're hesitant to make these assumptions in our base-case scenario today.

Exhibit 21 Even Our Bullish Scenario for Palantir Doesn't Justify Current Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

DocuSign (Analyst: Dan Romanoff)

DocuSign's vision is to modernize the contracting process by taking it from a disjointed and paper-based manual sequence of steps to an automated digital and collaborative system. We believe DocuSign is a leader in electronic signatures and contract life cycle management software. We think the company has a long runway for growth through viral adoption in greenfield opportunities. We also see existing customers adopting more use cases and expanding seats over time, and also moving to the Agreement Cloud platform.

Exhibit 22 DocuSign Rose 193% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

DocuSign's stock more than doubled in 2020 in light of the COVID-19 pandemic, Almost immediately upon the overnight shift to remote work for knowledge workers, e-signature was seen as way to enable business as (mostly) usual for everyday business processes including internal approvals and external contract execution. DocuSign is one of the two leaders, along with Adobe, in this market.

Exhibit 23 DocuSign Trades at Premium Multiples

Fair Value Estimate	$	152
Share Price	$	224
Market Cap ($m)	$	41,761

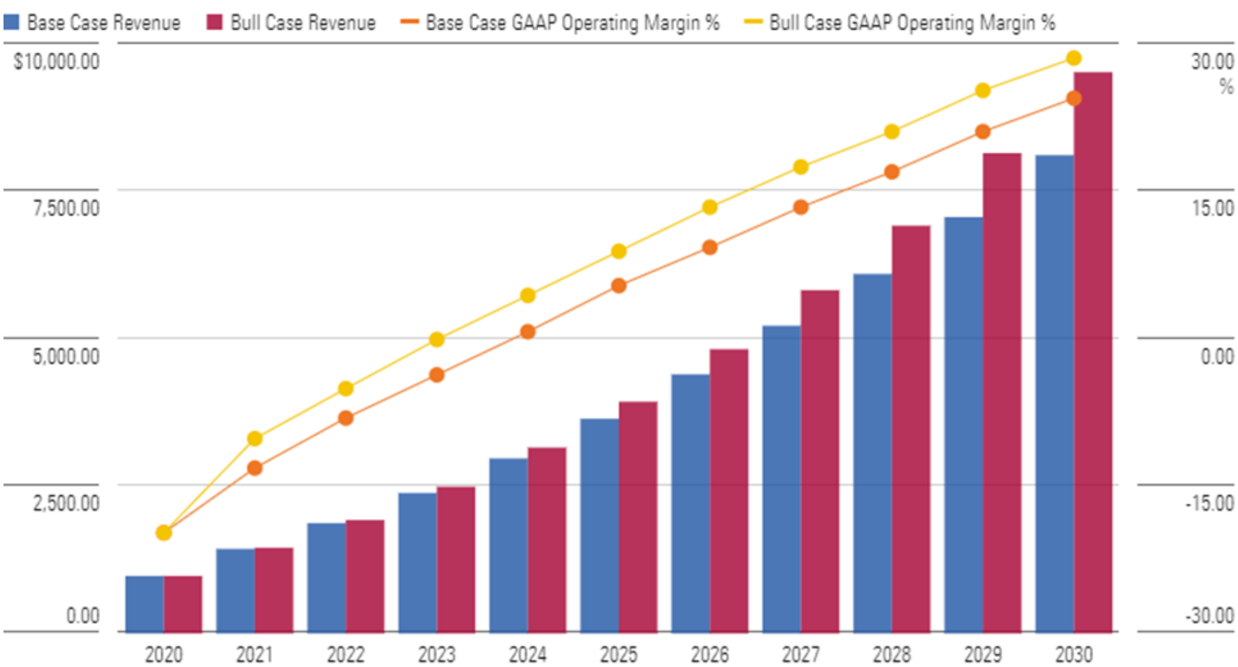
Morningstar Estimates:	2021	2022	2025
Revenue	1,433	1,868	3,638
Adj. EPS	0.76	1.21	2.78
Price/Sales	29.1	22.4	11.5
Price/Earnings	295.1	185.0	80.6

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case valuation for DocuSign, we model a 30% compound annual growth rate over the next five years and growth in the 15%-20% range thereafter. We think medium-term growth will be primarily driven by new users and more seats at existing customers as well as increasing adoption of the Agreement Cloud. In turn, we project non-GAAP operating margin improving from 8% in fiscal 2020 (actual) to the high-teens area in 2025.

Our bull-case fair value estimate is $259 per share. In this scenario, DocuSign has better success in gathering new customers, upselling existing customers, gaining traction with new solutions, and moving into adjacent markets. These factors combine to drive faster revenue growth relative to our base case, which in turn drives better margins. We model a 32% CAGR for revenue over the next five years, with non-GAAP operating margin reaching into the low-20% area by fiscal 2025.

Exhibit 24 We Can Construct a Bullish Scenario for DocuSign That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Nvidia (Analyst: Abhinav Davuluri)

Nvidia is the leading designer of graphics processing units (GPUs) that enhance the visual experience on computing platforms. The firm's chips are used in a variety of end markets. Gaming on high-end PCs has been the traditional GPU business, but Nvidia is moving into nascent markets such as artificial intelligence (deep learning), which includes training neural networks for uses such as image and speech recognition, and self-driving vehicles.

Exhibit 25 Nvidia Rose 118% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Nvidia's stock more than doubled in 2020 for a couple of reasons. First, the company closed its acquisition of Mellanox, which improved Nvidia's position within IT data centers and reduced the firm's reliance on gaming. We also saw the stock rise in response to Intel's woes, as Intel's manufacturing struggles may pave the way for less chip competition in artificial intelligence and data centers. Finally, Nvidia announced the pending acquisition of ARM Holdings. ARM (formerly wide-moat rated in isolation) is dominant in instructions sets used in mobile processors, and Nvidia's ownership of ARM (if approved) can give the combined firm the inside track into future non-x86 server processor sales while leveraging its AI expertise into ARM-dominated end markets like smartphones.

Exhibit 26 Nvidia Trades at Premium Multiples as the Company Expands in AI and Data Centers

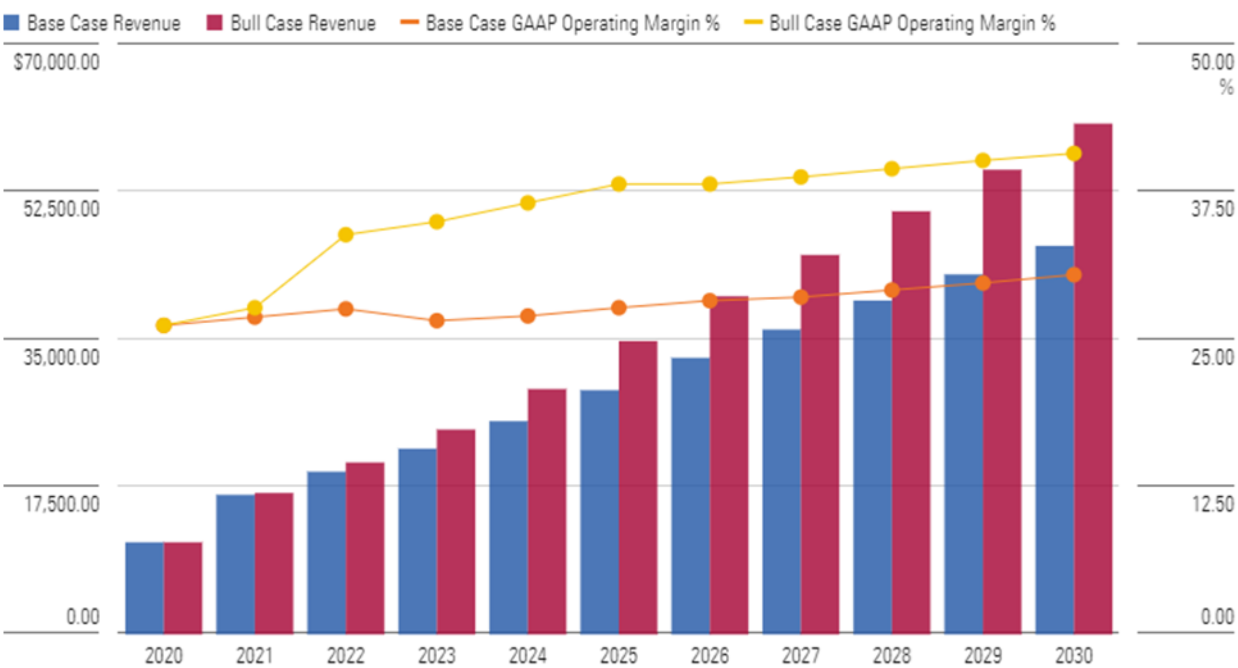
Fair Value Estimate	$	340		
Share Price	$	505		
Market Cap ($m)	$	312,335		
Morningstar Estimates:		2021	2022	2025
Revenue		16,544	19,288	28,945
Adj. EPS		10.31	11.08	15.60
Price/Sales		18.9	16.2	10.8
Price/Earnings		48.9	45.5	32.4

Source: Morningstar. Data as of Jan. 7, 2021

Our $340 fair value estimate for Nvidia is probability weighted; we would value the firm at $392 with ARM (which is a deal that we estimate has a 50% chance of closing), but $288 per share if the deal were to be blocked or rejected. While ARM on its own is relatively valuation neutral for Nvidia, we assume significant revenue synergies for Nvidia's data center and AI-related segments to justify the increase with ARM in tow. On a standalone basis for Nvidia, we project revenue will increase at a 21.5% CAGR through fiscal 2025 as the firm continues to diversify its revenue sources to areas of strong potential. We see revenue rising from $16.5 billion in 2020 to $46 billion by 2029. We model GAAP operating margin expansion from the mid-20% range up to 30% by 2029.

Our standalone bull-case fair value estimate is $516 per share on a standalone basis and $568 with ARM, thanks to revenue synergy expectations if ARM is acquired. On a standalone basis, our bull-case scenario assumes total revenue grows 26% on average through fiscal 2025 and revenue reaching $60 billion by 2029 with strong growth in gaming, data center, and automotive. We also anticipate stronger operating leverage with GAAP operating margins reaching 40% by 2029.

Exhibit 27 We Can Construct a Bullish Scenario for Nvidia That Justifies Current Stock Prices, Especially If the ARM Deal Closes



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Twilio (Analyst: Nupur Balain)

Twilio is a leading communications platform as a service, or cPaaS, firm that enables developers to integrate communications capabilities such as messaging, voice, and video into client-facing products, thus helping businesses strengthen customer engagement worldwide. Via its cPaaS platform, businesses and individuals can integrate real-time omnichannel communications capabilities into business applications, expanding the number of touchpoints with their customers. We view narrow-moat Twilio as having a long growth runway ahead, as the company continues to make strategic organic and inorganic investments to expand its platform.

Exhibit 28 Twilio Rose 228% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Twilio's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. By providing digital solutions in the cloud to ensure uninterrupted customer interactions as businesses went remote, Twilio was able to deliver strong results. We saw consistent outperformance of management expectations, secular tailwinds in software-as-a-service, and the capability to provide a host of cloud-native communication products to businesses that support interactions with customers.

Exhibit 29 Twilio Trades at Premium Multiples, but We Foresee Strong Growth to Mostly Justify It

Fair Value Estimate	$	302
Share Price	$	329
Market Cap ($m)	$	52,800

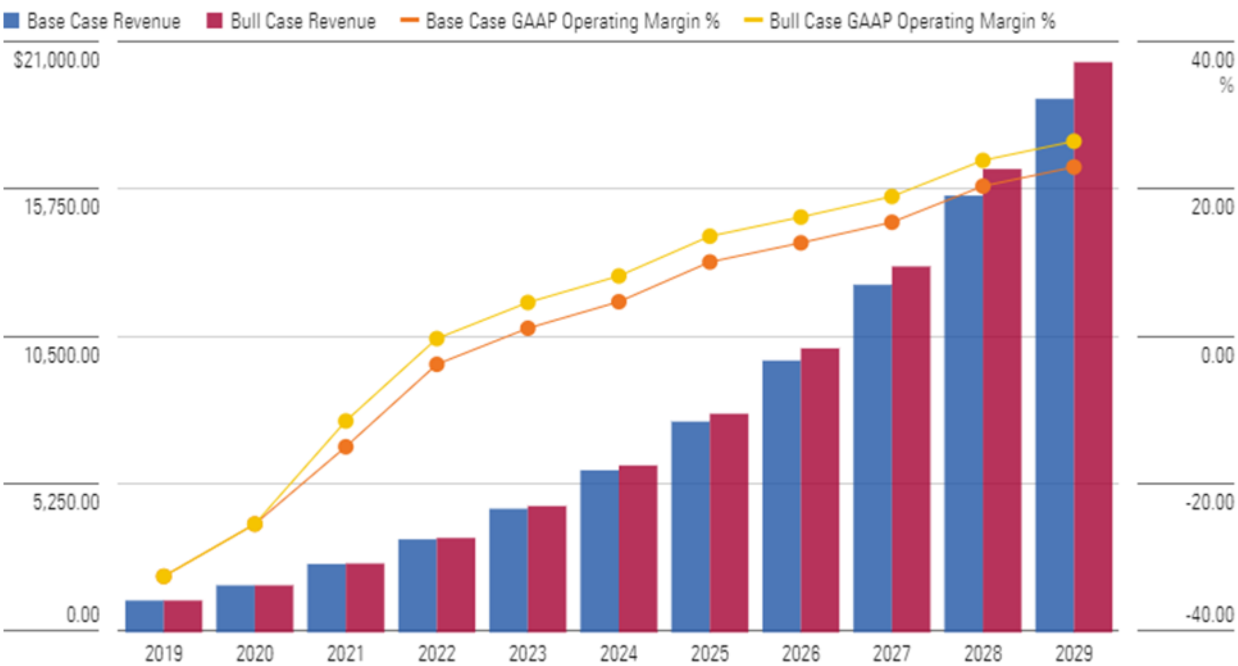
Morningstar Estimates:	2020	2021	2024
Revenue	1,673	2,433	5,767
Adj. EPS	0.12	0.34	4.80
Price/Sales	31.6	21.7	9.2
Price/Earnings	2,691.1	977.2	68.5

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for Twilio, we foresee tremendous growth over the next five years, from $1.1 billion of revenue in 2019 up to $19 billion by 2029 and 19% EBI growth in the five-year period thereafter. We believe Twilio benefits from high customer switching costs that will enable the firm to retain and expand its existing customer cohort today while reaching new customers in the decade ahead. On the spending front, we anticipate robust operating leverage thanks to both strong sales growth and as spending shifts from customer acquisition to customer retention. By the end of the decade, we project that Twilio's profitability will resemble that of more mature software leaders today with mid-20% GAAP operating margins.

Our bull-case scenario for Twilio implies a $457 fair value estimate. In this scenario, revenue and operating margin expansion are modestly ahead of our base-case valuation for the next 10 years. We project revenue exceeding $20 billion by 2029 along with GAAP operating margins as high as 26.5% by 2029. We model 22% EBI growth in the five years thereafter.

Exhibit 30 We Can Construct a Bullish Scenario for Twilio That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Coupa Software (Analyst: Nupur Balain)

Coupa Software offers a cloud-based business spend management platform that helps businesses control, monitor, and analyze expenditures to realize cost savings and improve operational efficiency. With a platform encompassing over 1,400 businesses and over 5 million suppliers, Coupa offers an end-to-end spend management platform covering procurement, invoicing, payments, cost analytics, and more. As the firm's platform continues to expand and incorporate broader spend management solutions, we believe narrow-moat Coupa will exhibit healthy long-term growth.

Exhibit 31 Coupa Rose 121% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Coupa's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. Given Coupa's ability to help enterprises reduce their indirect expense spending, adoption during the pandemic outpaced the market's expectations at the start of the year, and this trend continued in later quarters, as well. Coupa's performance surpassed management expectations each quarter, as businesses looked to adopt a holistic cloud-native platform to manage their spending needs. With the recent acquisition of Llamasoft, Coupa has expanded its foothold in the direct spend management arena as well, which accounted for a proportion of stock gains seen in the final month of 2020.

Exhibit 32 Coupa Trades at Premium Multiples, Which We Struggle to Justify

Fair Value Estimate	$	249
Share Price	$	318
Market Cap ($m)	$	22,959

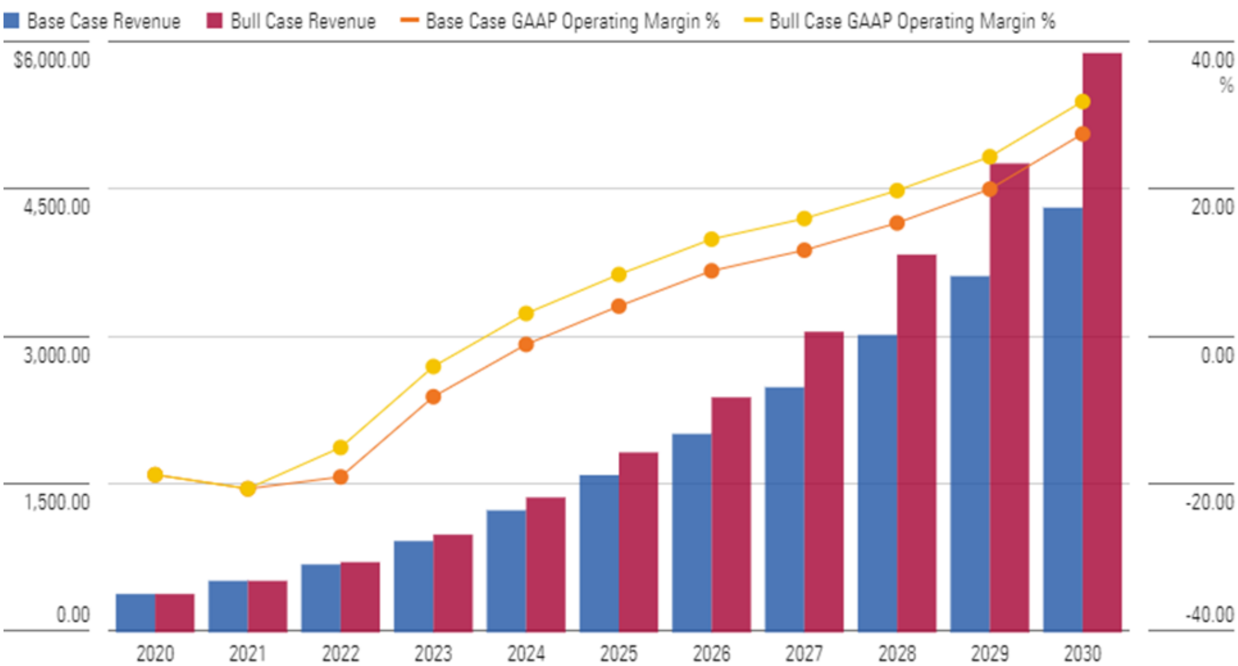
Morningstar Estimates:	2021	2022	2025
Revenue	524	690	1,599
Adj. EPS	0.48	0.63	3.33
Price/Sales	43.8	33.3	14.4
Price/Earnings	667.7	503.8	95.7

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for Coupa, we expect revenue to grow at a compound annual growth rate of 33% through fiscal 2025 and reach $4.3 billion of revenue by fiscal 2029 versus $0.5 billion of revenue in fiscal 2020. Driving this growth are new customer additions (we expect a 29% CAGR over the next five years) as well as the expansion of Coupa's platform into new modules that will support cross-selling opportunities. Coupa should benefit from operating leverage, and we expect expansion in GAAP operating margin from negative 19% in fiscal 2020 to 4% in fiscal 2025. We also expect to see non-GAAP operating margins grow into the high teens by fiscal 2025 compared with 8% in fiscal 2020.

In our bull case, we assign Coupa a fair value estimate of $447. In this scenario, we believe that Coupa's leadership position in the space will lead to growth in active customers at a 30% CAGR over the next five years. In turn, Coupa will reach $5.9 billion of revenue in fiscal 2029. These factors will allow Coupa to scale up faster and benefit from operating leverage, as well. In our bull case, non-GAAP operating margins surpass 20% by fiscal 2025 and exceed 30% by fiscal 2029.

Exhibit 33 We Can Construct a Bullish Scenario for Coupa That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

RingCentral (Analyst: Dan Romanoff)

RingCentral is a provider of unified-communication-as-a-service, or UCaaS, software, which is replacing on-premises private branch exchanges that support telephones with an easy-to-use, integrated communication platform. We believe that RingCentral's UCaaS offers a strong value proposition and plays a critical role (in both internal and external communications) in the daily workflow of employees that will allow it to earn excess returns for the next decade.

Exhibit 34 RingCentral Rose 119% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

RingCentral's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. As companies continue to navigate the remote work environment across the globe, we believe RingCentral will be able to leverage its position in the UCaaS market and capitalize on digital transformation trends by offering an enhanced communications platform.

Exhibit 35 RingCentral Trades at Premium Multiples and Ahead of Our Valuation

Fair Value Estimate	$	293
Share Price	$	373
Market Cap ($m)	$	33,413

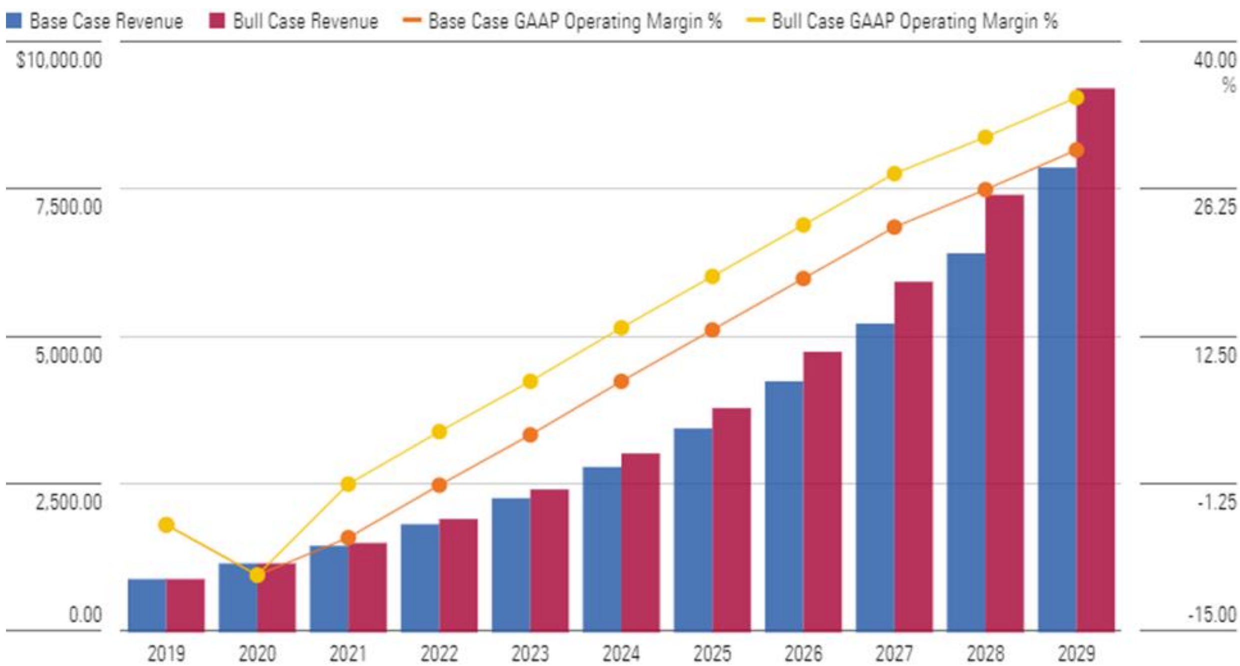
Morningstar Estimates:	2020	2021	2024
Revenue	1,168	1,467	2,801
Adj. EPS	0.97	1.32	4.16
Price/Sales	28.6	22.8	11.9
Price/Earnings	385.7	282.2	89.7

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for RingCentral, we model a 25% compound annual growth rate over the next five years based primarily on organic seat growth from both new and existing customers. Despite projecting large growth in seat count, our projections still imply a low penetration of RingCentral's total market opportunity as well as of Avaya's current on-premises installed base. We project GAAP operating margin rising from a loss today to 8% in 2024 and 30% in 2029 as the company benefits from operating leverage and the full transition to subscriptions.

Our bull-case fair value estimate is $404 per share. In this scenario, we believe that RingCentral's seat count will grow more rapidly and will push revenue higher than our base case. We think this growth would come increasingly from enterprise customers rather than midmarket and small to midsize businesses. We further believe that the Avaya partnership will be a driving force in this regard. In our bull case, we model a 27% CAGR for revenue over the next five years, with GAAP operating margins expanding to 13% in 2024 and the 35% range in 2029.

Exhibit 36 We Can Construct a Bullish Scenario for RingCentral That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

CrowdStrike (Analyst: Mark Cash)

CrowdStrike is a leader in endpoint protection, a necessity that aids in protecting devices and networks, and an industry that has evolved considerably from being an antivirus that provides security based on previously known malware. We believe that CrowdStrike's customer base, revenue, and margins will experience profound growth throughout the 2020s as customers update their endpoint and workload security requirements in a hybrid-cloud world.

Exhibit 37 CrowdStrike Rose 328% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

CrowdStrike's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. For CrowdStrike, Okta, and Zscaler, the rise in remote working and distributed networking environments immediately created an alarmingly complex situation for security teams that we believe exposed holes in entities' threat prevention capabilities. In turn, adoption of CrowdStrike's cloud-based cybersecurity solutions accelerated rapidly in 2020.

Exhibit 38 CrowdStrike Trades at Premium Multiples and Modestly Ahead of Our Fair Value Estimate

Fair Value Estimate	$	162
Share Price	$	209
Market Cap ($m)	$	46,740

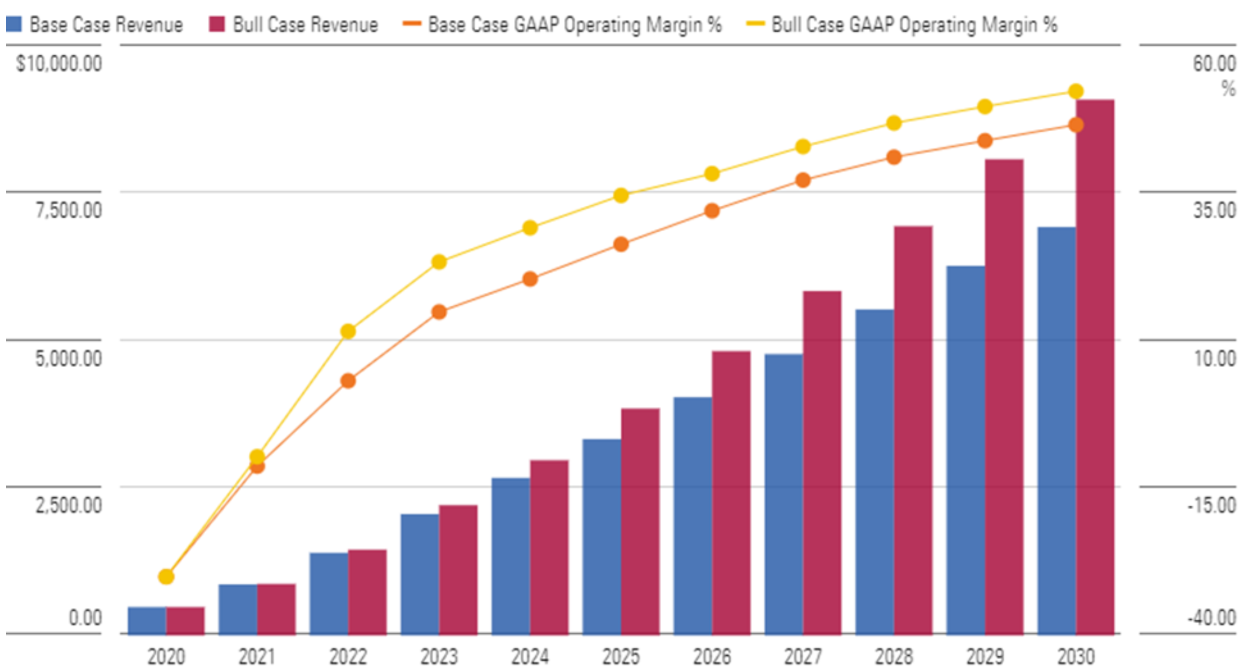
Morningstar Estimates:	2021	2022	2025
Revenue	865	1,400	3,327
Adj. EPS	0.23	0.66	3.92
Price/Sales	54.0	33.4	14.1
Price/Earnings	895.6	316.0	53.3

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for CrowdStrike, we forecast a five-year revenue CAGR of 47% through a rapidly growing customer base, more massive deals, strong retention rates, and customers buying additional security modules over time. In our view, entities will increasingly need protection from items such as zero-day threats, file-less attacks, and anomalous behavior. They would also require assistance in threat hunting and remediation, which can cause CrowdStrike's solutions to become an essential part of security spending. We also model GAAP operating margins improving into the mid-20% range in fiscal 2024 and as high as the mid-40% range in fiscal 2029, on par with leading mature cybersecurity vendors like CheckPoint.

Our bull-case scenario for CrowdStrike implies a $231 fair value estimate, coming from a faster-growing customer base and clients adopting a higher rate of security subscriptions modules per customer than our base case. In turn, this scenario has a five-year revenue CAGR higher than 52%. As subscriptions grow faster than services, we expect operating margin to expand higher than the base case as CrowdStrike executes on increasing revenue per customer after landing the initial sale. GAAP operating margin may reach as high as 50% by fiscal 2029.

Exhibit 39 We Can Construct a Bullish Scenario for CrowdStrike That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Okta (Analyst: Mark Cash)

Okta's cloud-based identity access solutions upended the prevailing methodology of protecting users and providing access to digital resources based upon on-premises products. We believe that Okta's innovative methodology for user access and security will provide it with a sustainable presence, and we expect strong revenue growth alongside significant margin expansion.

Exhibit 40 Okta Rose 117% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Okta's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. For CrowdStrike, Okta, and Zscaler, the rise in remote working and distributed networking environments immediately created an alarmingly complex situation for security teams that we believe exposed holes in entities' threat prevention capabilities. In turn, adoption of Okta's identity access solutions accelerated rapidly in 2020.

Exhibit 41 Okta Trades at Premium Multiples, but the Stock Is Only Modestly Overvalued

Fair Value Estimate	$	232
Share Price	$	240
Market Cap ($m)	$	31,036

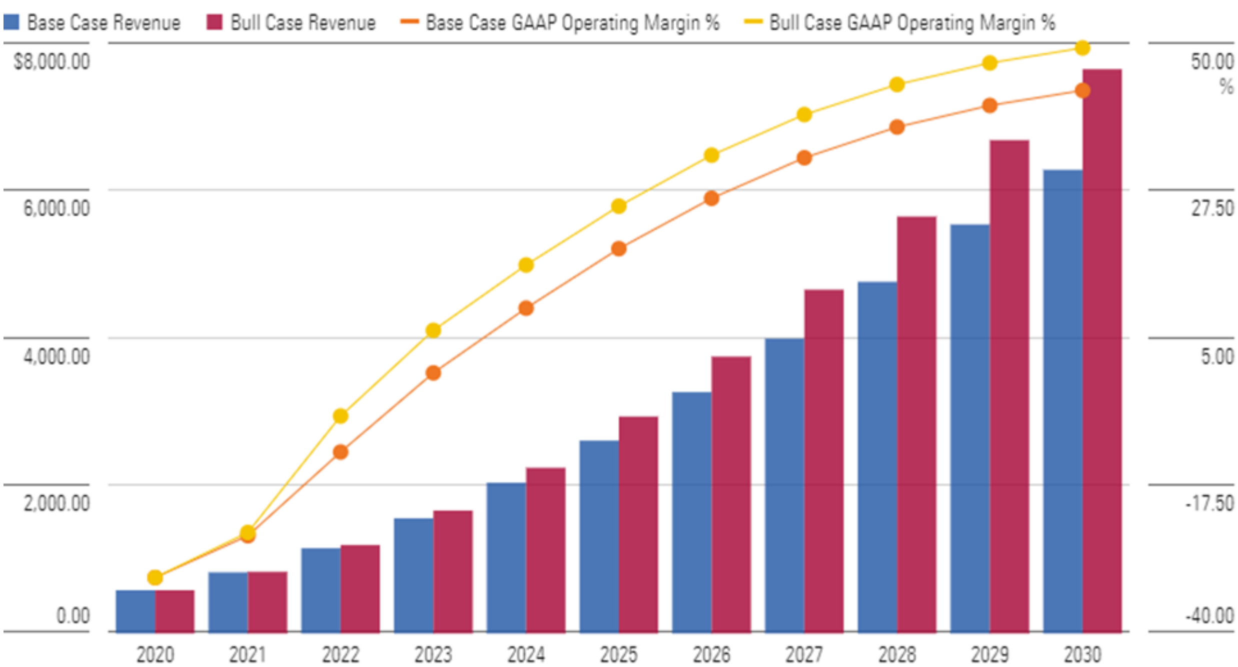
Morningstar Estimates:	2021	2022	2025
Revenue	828	1,155	2,614
Adj. EPS	0.07	0.21	4.71
Price/Sales	37.5	26.9	11.9
Price/Earnings	3,439.4	1,155.2	50.9

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for Okta, we foresee tremendous growth over the next five years, from $0.8 billion of revenue in 2020 up to $6.3 billion by 2029. We forecast a 35% five-year sales CAGR driven by a prolifically expanding customer base, larger deal sizes, and resilient retention rates. Thanks to operating leverage, we also model GAAP operating margin rising into the mid- to high-teens in fiscal 2025 and as high as 43% by the end of the decade, up from losses earned in fiscal 2020.

Our bull-case fair value estimate of $309 per share is driven by a faster growing customer base purchasing higher value solutions, compared with our base case, leading to a 38% five-year revenue CAGR. With more subscription products sold and better utilization of its cloud infrastructure, we model gross margin expanding to 82% in fiscal 2025. In turn, we model Okta to turn profitable in fiscal 2024, with GAAP operating margin being pushed into the low- to mid-20% range in fiscal 2025 and as high as 47% by fiscal 2030.

Exhibit 42 We Can Construct a Bullish Scenario for Okta That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Zscaler (Analyst: Mark Cash)

Zscaler wagered heavily on the secular trend of cloud computing and the ways in which this shift would upend the previous paradigms of network and application security. Its bet has paid dividends, as it has leveraged a distributed cloud to deliver a multitenant security platform that offers security capabilities traditionally sold as purpose-built appliances. Although Zscaler has been at it since 2007, we think its business model and security approach are in their early innings, and we see a long runway for growth in an addressable market worth tens of billions of dollars.

Exhibit 43 Zscaler Rose 206% in 2020 Versus the Morningstar US Technology Index of 44% and the Morningstar US Market Index of 20%

Source: Pitchbook. Data as of Jan. 5, 2021.

Zscaler's stock more than doubled in 2020 thanks to strong sales growth despite the COVID-19 pandemic. For CrowdStrike, Okta, and Zscaler, the rise in remote working and distributed networking environments immediately created an alarmingly complex situation for security teams that we believe exposed holes in entities' threat prevention capabilities. In turn, adoption of Zscaler's cloud-based security solutions accelerated rapidly in 2020.

Exhibit 44 Zscaler Trades at Premium Multiples and Has Run Up Past Our Fair Value Estimate

Fair Value Estimate	$	140
Share Price	$	184
Market Cap ($m)	$	25,963

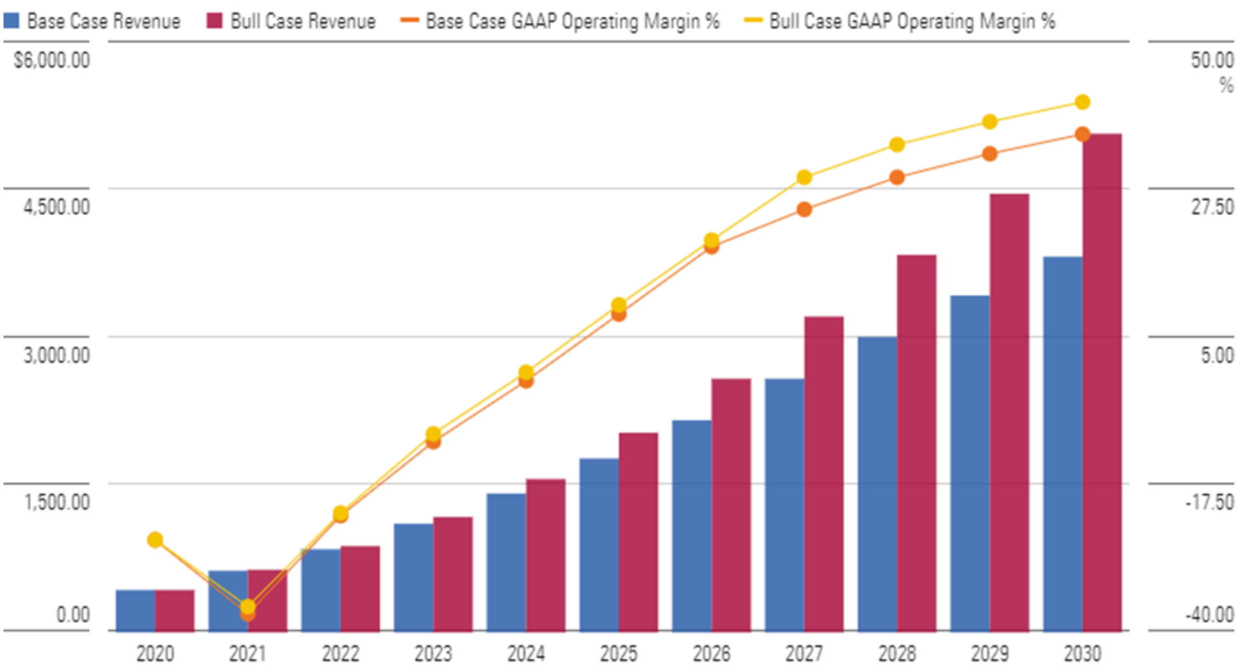
Morningstar Estimates:	2021	2022	2025
Revenue	626	845	1,767
Adj. EPS	0.47	0.81	2.60
Price/Sales	41.5	30.7	14.7
Price/Earnings	389.4	227.1	71.0

Source: Morningstar. Data as of Jan. 7, 2021

In our base-case scenario for Twilio, we anticipate that Zscaler will continue its torrid top-line growth, with the secular trends of cloud and mobility serving as the primary demand drivers. We model a five-year compound annual growth rate of approximately 33%. Zscaler's historical revenue growth has far exceeded its customer growth, and we think this trend will continue, as the firm's proven ability to extract incremental value from its base drives continued sales growth. We also model healthy operating leverage with GAAP operating margin reaching the low teens by fiscal 2025 and the 35% range by fiscal 2030.

Our bull-case fair value estimate is $202 per share. In this scenario, public cloud and SaaS adoption is even more robust than our baseline expectations. The firm's success translates to a five-year revenue CAGR of roughly 36% and $5.1 billion of revenue by fiscal 2030 versus $0.6 billion earned in fiscal 2020. We also model even greater operating leverage leading to GAAP operating margin as high as the low-40% range by fiscal 2030.

Exhibit 45 We Can Construct a Bullish Scenario for Zscaler That Justifies Current Stock Prices



Source: Morningstar Estimates. Data as of Jan. 5, 2021

Appendix 1 U.S. Tech & Communication Services Stocks With >= 100% 1 Year Price Change and >= $20 Billion in Market Cap Since 1995. Includes Some Non-U.S. Names

Year	Ticker	Company Name	Price % Change YTD	Market Cap	Current Stock Price	Market Cap Today	Market Cap CAGR Growth
1994	T	AT&T Corp	219.03%	78,486,383	29.44	204,943,760	3.8%
1995	CSCO	Cisco Systems (NAS: CSCO)	112.40%	20,603,962	43.96	189,091,769	9.3%
1996	INTC	Intel (NAS: INTC)	130.73%	107,505,024	49.67	204,162,360	2.7%
1997	T	AT&T Broadband and Internet Services	113.87%	41,177,285	29.44	204,943,760	7.2%
1998	CSCO	Cisco Systems (NAS: CSCO)	149.72%	145,999,568	43.96	189,091,769	1.2%
1998	DELL	Dell EMC	203.19%	41,898,816	72.49	54,953,163	1.2%
1998	MSFT	Microsoft (NAS: MSFT)	114.59%	348,106,880	217.69	1,681,605,513	7.4%
1998		Sun Microsystems	114.72%	32,648,233			
1998		Vodafone Group (LON: VOD)	123.20%	49,988,097			
1998		Warner Media	587.20%	72,219,331			
1998		WorldCom Group	137.18%	88,026,504			
1999	AKAM	Akamai Technologies (NAS: AKAM)	125.66%	30,304,985	105.24	17,091,741	-2.7%
1999	AMAT	Applied Materials (NAS: AMAT)	196.78%	48,479,190	86.87	78,907,904	2.3%
1999	LON:BT.A	BT Group (UK) (LON: BT.A)	131.57%	143,743,826	1.80	17,911,445	-9.4%
1999	CSCO	Cisco Systems (NAS: CSCO)	130.84%	355,122,690	43.96	189,091,769	-3.0%
1999	GLW	Corning (NYS: GLW)	186.53%	31,641,140	34.92	27,504,361	-0.7%
1999	DELL	Dell EMC	162.64%	113,539,786	72.49	54,953,163	-3.4%
1999		Deutsche Telekom (ETR: DTE)	108.45%	207,533,392			
1999		DirecTV	141.89%	32,997,408			
1999	DISH	Dish Network (NAS: DISH)	706.18%	22,352,947	31.53	17,011,114	-1.3%
1999		Gateway	181.56%	22,551,209			
1999	MSI	Motorola Solutions (NYS: MSI)	141.15%	90,234,665	167.50	28,829,058	-5.3%
1999		Nortel Networks	304.00%	139,092,624			
1999	ORCL	Oracle (NYS: ORCL)	289.76%	158,095,944	63.75	190,449,559	0.9%
1999	QCOM	Qualcomm (NAS: QCOM)	2,618.82%	124,738,946	148.50	172,296,540	1.5%
1999		Solectron	104.70%	28,188,792			
1999		Sun Microsystems	261.72%	135,281,408			
1999	TXN	Texas Instruments (NAS: TXN)	125.69%	78,546,406	162.22	150,661,842	3.2%
1999	VIAV	Viavi Solutions (NAS: VIAV)	830.09%	57,447,142	14.74	3,429,181	-12.6%
2000		Applied Micro Circuits	135.90%	22,188,129			
2000		Brocade Communication Systems	107.49%	20,560,387			
2000	CHKP	Check Point Software Technologies (NA:	168.81%	40,587,673	129.88	18,633,994	-3.8%
2000	CIEN	Ciena (NYS: CIEN)	182.61%	23,280,614	51.18	8,168,726	-5.1%
2000	JNPR	Juniper Networks (NYS: JNPR)	122.46%	40,032,187	22.61	7,422,366	-8.1%
2001		Pegasus Wireless	237.33%	25,780,500			
2003		China Telecom (HKG: 00728)	132.84%	30,921,646			
2003	DELL	Dell EMC	110.42%	31,198,428	72.49	54,953,163	3.4%
2003		Embratel Participacoes	219.15%	593,858,733			
2003	INTC	Intel (NAS: INTC)	105.84%	207,908,350	49.67	204,162,360	-0.1%
2003		Nextel Communications	142.94%	29,852,107			
2003	ETR:SAP	SAP (ETR: SAP)	110.88%	52,891,345	131.37	153,374,246	6.5%
2004	AAPL	Apple (NAS: AAPL)	201.36%	26,052,957	129.41	2,255,969,107	32.2%
2005	GOOGL	Alphabet (NAS: GOOGL)	115.19%	122,611,098	1,726.13	1,185,281,042	16.3%
2005	AAPL	Apple (NAS: AAPL)	123.26%	60,586,588	129.41	2,255,969,107	27.3%
2005		Embratel Participacoes	208.97%	675,411,314			
2005		SoftBank Group (TKS: 9984)	161.55%	44,505,462			
2007	AAPL	Apple (NAS: AAPL)	133.47%	174,038,806	129.41	2,255,969,107	21.8%
2007	TSE:BB	Blackberry (TSE: BB)	166.76%	63,764,990	6.63	3,729,097	-19.6%
2007		China Mobile (HKG: 00941)	104.26%	354,247,374			
2007	FSLR	First Solar (NAS: FSLR)	795.24%	20,990,582	101.24	10,483,163	-5.2%
2007		REC Silicon (OSL: RECSI)	178.95%	25,069,986			
2007		SunEdison	129.03%	20,547,302			
2007		Turkcell Iletisim Hizmetleri (IST: TCELL)	118.05%	24,068,787			
2009	GOOGL	Alphabet (NAS: GOOGL)	101.52%	197,012,284	1,726.13	1,185,281,042	17.7%
2009	AAPL	Apple (NAS: AAPL)	146.90%	190,982,657	129.41	2,255,969,107	25.2%
2009	GLW	Corning (NYS: GLW)	102.62%	29,988,430	34.92	27,504,361	-0.8%
2009		Hon Hai Precision (TAI: 2317)	178.61%	39,391,598			
2009	INFY	Infosys (NSE: INFY)	137.56%	31,930,566	17.58	72,993,236	7.8%
2009		ProSiebenSat.1 Media (ETR: PSM)	241.19%	20,213,255			
2009	TCS	Tata Consultancy Services (NSE: TCS)	216.68%	31,585,396	9.72	482,296	-31.6%
2009		Telenor Group (OSL: TEL)	111.68%	23,187,757			
2009		Tencent Holdings (HKG: 00700)	237.78%	39,149,711			
2009	WIT	Wipro (BOM: 507685)	187.32%	21,409,075	5.73	30,148,559	3.2%

Source: Morningstar. Data as of Jan. 5, 2021

Appendix 1 (Continued) U.S. Tech & Communication Services Stocks With >= 100% 1 Year Price Change and >= $20 Billion in Market Cap Since 1995. Includes Some Non-U.S. Names

Year	Ticker	Company Name	Price % Change YTD	Market Cap	Current Stock Price	Market Cap Today	Market Cap CAGR Growth
2010		Baidu (FRA: B1C)	138.15%	33,624,243			
2010	VMW	VMware (NYS: VMW)	109.79%	36,843,915	138.68	58,878,058	4.8%
2013	FB	Facebook (NAS: FB)	105.30%	134,153,902	268.94	778,039,626	28.5%
2013	MU	Micron Technology (NAS: MU)	243.06%	22,999,485	74.05	83,969,196	20.3%
2013		Naver (KRX: 035420)	164.79%	20,418,388			
2013	NFLX	Netflix (NAS: NFLX)	297.63%	21,816,943	522.86	238,891,815	40.8%
2013	NYS:NOK	Nokia (HEL: NOKIA)	106.47%	30,097,306	3.89	21,210,805	-4.9%
2013		SoftBank Group (TKS: 9984)	140.53%	104,465,986			
2013		SouFun Holding (NYS: SFUN)	229.64%	67,191,752			
2015	NFLX	Netflix (NAS: NFLX)	134.38%	48,884,672	522.86	238,891,815	37.3%
2016	NVDA	Nvidia (NAS: NVDA)	223.85%	57,532,860	524.54	323,241,800	54.0%
2017		Tencent Holdings (HKG: 00700)	112.35%	493,315,980			
2017		Weibo (NAS: WB)	154.83%	22,887,111			
2017		ZTE (SHE: 000063)	142.35%	21,966,489			
2019	AMD	Advanced Micro Devices (NAS: AMD)	148.43%	53,521,806	92.30	110,425,653	106.3%
2019	LRCX	Lam Research (NAS: LRCX)	114.73%	42,421,067	478.02	68,011,234	60.3%
2019	SHOP	Shopify (TSE: SHOP)	185.15%	45,806,108	1,096.43	137,605,295	200.4%
2019	SNAP	Snap (NYS: SNAP)	196.37%	22,861,509	49.59	74,603,331	226.3%
2020	ADYEN	Adyen (AMS: ADYEN)	186.15%	70,949,641	2,343.09		
2020	NET	Cloudflare (NYS: NET)	345.43%	23,351,802	74.59		
2020	COUP	Coupa (NAS: COUP)	131.73%	24,461,235	335.92		
2020	CRWD	CrowdStrike (NAS: CRWD)	324.74%	46,868,085	200.49		
2020	DDOG	Datadog (NAS: DDOG)	160.56%	29,978,164	91.23		
2020	DOCU	DocuSign (NAS: DOCU)	199.96%	41,471,603	222.41		
2020	ENPH	Enphase Energy (NAS: ENPH)	571.53%	22,167,576	172.24		
2020		LG Electronics (KRX: 066575)	138.68%	23,287,760			
2020	MDB	MongoDB (NAS: MDB)	172.81%	21,638,019	350.41		
2020	NVDA	Nvidia (NAS: NVDA)	121.93%	323,241,800	524.54		
2020	OKTA	Okta (NAS: OKTA)	120.39%	32,918,046	250.67		
2020	PLTR	Palantir Technologies (NYS: PLTR)	147.89%	44,225,340	23.37		
2020	PINS	Pinterest (NYS: PINS)	253.54%	40,730,840	68.07		
2020	RNG	RingCentral (NYS: RNG)	124.68%	33,967,728	382.20		
2020	ROKU	Roku (NAS: ROKU)	147.96%	42,143,787	317.90		
2020	SHOP	Shopify (TSE: SHOP)	185.18%	137,415,370	1,096.43		
2020	SNAP	Snap (NYS: SNAP)	206.61%	74,603,331	49.59		
2020	SPOT	Spotify (NYS: SPOT)	110.40%	59,655,182	311.00		
2020	SQ	Square (NYS: SQ)	247.89%	98,141,885	221.16		
2020	STNE	Stone Pagamentos (NAS: STNE)	110.38%	25,863,436	82.67		
2020	TTD	The Trade Desk (NAS: TTD)	208.34%	37,618,400	773.43		
2020	TWLO	Twilio (NYS: TWLO)	244.42%	54,323,068	334.59		
2020		United Microelectronics Corporation (TA	207.76%	20,998,003			
2020	U	Unity (NYS: U)	124.54%	41,556,148	144.08		
2020		Xiaomi Technology (HKG: 01810)	208.02%	107,372,671			
2020	ZG	Zillow Group (NAS: ZG)	197.20%	30,610,988	136.51		
2020	ZM	Zoom Video Communications (NAS: ZM)	395.77%	96,475,899	359.98		
2020	ZS	Zscaler (NAS: ZS)	329.48%	26,799,456	196.09		

Source: Morningstar. Data as of Jan. 5, 2021

Appendix 2 U.S. Tech Stocks With >= 100% 1 Year Price Change and >= $20 Billion in Market Cap Since 1995. Includes Some Non-U.S. Names

Year	Ticker	Company Name	Price % Change YTD	Market Cap	Current Stock Price	Market Cap Today	Market Cap CAGR Growth
1995	CSCO	Cisco Systems (NAS: CSCO)	112.40%	20,603,962	43.96	189,091,769	9.3%
1996	INTC	Intel (NAS: INTC)	130.73%	107,505,024	49.67	204,162,360	2.7%
1998	CSCO	Cisco Systems (NAS: CSCO)	149.72%	145,999,568	43.96	189,091,769	1.2%
1998	DELL	Dell EMC	203.19%	41,898,816	72.49	54,953,163	1.2%
1998	MSFT	Microsoft (NAS: MSFT)	114.59%	348,106,880	217.69	1,681,605,513	7.4%
1998		Sun Microsystems	114.72%	32,648,233			
1999	AMAT	Applied Materials (NAS: AMAT)	196.78%	48,479,190	86.87	78,907,904	2.3%
1999	CSCO	Cisco Systems (NAS: CSCO)	130.84%	355,122,690	43.96	189,091,769	-3.0%
1999	GLW	Corning (NYS: GLW)	186.53%	31,641,140	34.92	27,504,361	-0.7%
1999	DELL	Dell EMC	162.64%	113,539,786	72.49	54,953,163	-3.4%
1999		Gateway	181.56%	22,551,209			
1999	MSI	Motorola Solutions (NYS: MSI)	141.15%	90,234,665	167.50	28,829,058	-5.3%
1999		Nortel Networks	304.00%	139,092,624			
1999	ORCL	Oracle (NYS: ORCL)	289.76%	158,095,944	63.75	190,449,559	0.9%
1999	QCOM	Qualcomm (NAS: QCOM)	2,618.82%	124,738,946	148.50	172,296,540	1.5%
1999		Solectron	104.70%	28,188,792			
1999		Sun Microsystems	261.72%	135,281,408			
1999	TXN	Texas Instruments (NAS: TXN)	125.69%	78,546,406	162.22	150,661,842	3.2%
1999	VIAV	Viavi Solutions (NAS: VIAV)	830.09%	57,447,142	14.74	3,429,181	-12.6%
2000		Applied Micro Circuits	135.90%	22,188,129			
2000		Brocade Communication Systems	107.49%	20,560,387			
2000	CHKP	Check Point Software Technologies (N	168.81%	40,587,673	129.88	18,633,994	-3.8%
2000	CIEN	Ciena (NYS: CIEN)	182.61%	23,280,614	51.18	8,168,726	-5.1%
2000	JNPR	Juniper Networks (NYS: JNPR)	122.46%	40,032,187	22.61	7,422,366	-8.1%
2003	DELL	Dell EMC	110.42%	31,198,428	72.49	54,953,163	3.4%
2003	INTC	Intel (NAS: INTC)	105.84%	207,908,350	49.67	204,162,360	-0.1%
2003	ETR:SAP	SAP (ETR: SAP)	110.88%	52,891,345	131.37	153,374,246	6.5%
2004	AAPL	Apple (NAS: AAPL)	201.36%	26,052,957	129.41	2,255,969,107	32.2%
2005	GOOGL	Alphabet (NAS: GOOGL)	115.19%	122,611,098	1,726.13	1,185,281,042	16.3%
2005	AAPL	Apple (NAS: AAPL)	123.26%	60,586,588	129.41	2,255,969,107	27.3%
2007	AAPL	Apple (NAS: AAPL)	133.47%	174,038,806	129.41	2,255,969,107	21.8%
2007	TSE:BB	Blackberry (TSE: BB)	166.76%	63,764,990	6.63	3,729,097	-19.6%
2007	FSLR	First Solar (NAS: FSLR)	795.24%	20,990,582	101.24	10,483,163	-5.2%
2007		REC Silicon (OSL: RECSI)	178.95%	25,069,986			
2007		SunEdison	129.03%	20,547,302			
2009	GOOGL	Alphabet (NAS: GOOGL)	101.52%	197,012,284	1,726.13	1,185,281,042	17.7%
2009	AAPL	Apple (NAS: AAPL)	146.90%	190,982,657	129.41	2,255,969,107	25.2%
2009	GLW	Corning (NYS: GLW)	102.62%	29,988,430	34.92	27,504,361	-0.8%
2009		Hon Hai Precision (TAI: 2317)	178.61%	39,391,598			
2009	INFY	Infosys (NSE: INFY)	137.56%	31,930,566	17.58	72,993,236	7.8%
2009	TCS	Tata Consultancy Services (NSE: TC:	216.68%	31,585,396	9.72	482,296	-31.6%
2009		Tencent Holdings (HKG: 00700)	237.78%	39,149,711			
2009	WIT	Wipro (BOM: 507685)	187.32%	21,409,075	5.73	30,148,559	3.2%

Source: Morningstar. Data as of Jan. 5, 2021

Appendix 2 (Continued) U.S. Tech Stocks With >= 100% 1 Year Price Change and >= $20 Billion in Market Cap Since 1995. Includes Some Non-U.S. Names

Year	Ticker	Company Name	Price % Change YTD	Market Cap	Current Stock Price	Market Cap Today	Market Cap CAGR Growth
2010		Baidu (FRA: B1C)	138.15%	33,624,243			
2010	VMW	VMware (NYS: VMW)	109.79%	36,843,915	138.68	58,878,058	4.8%
2013	FB	Facebook (NAS: FB)	105.30%	134,153,902	268.94	778,039,626	28.5%
2013	MU	Micron Technology (NAS: MU)	243.06%	22,999,485	74.05	83,969,196	20.3%
2013		Naver (KRX: 035420)	164.79%	20,418,388			
2013	NFLX	Netflix (NAS: NFLX)	297.63%	21,816,943	522.86	238,891,815	40.8%
2013	NYS:NOK	Nokia (HEL: NOKIA)	106.47%	30,097,306	3.89	21,210,805	-4.9%
2013		SouFun Holding (NYS: SFUN)	229.64%	67,191,752			
2015	NFLX	Netflix (NAS: NFLX)	134.38%	48,884,672	522.86	238,891,815	37.3%
2016	NVDA	Nvidia (NAS: NVDA)	223.85%	57,532,860	524.54	323,241,800	54.0%
2017		Tencent Holdings (HKG: 00700)	112.35%	493,315,980			
2017		Weibo (NAS: WB)	154.83%	22,887,111			
2017		ZTE (SHE: 000063)	142.35%	21,966,489			
2019	AMD	Advanced Micro Devices (NAS: AMD	148.43%	53,521,806	92.30	110,425,653	106.3%
2019	LRCX	Lam Research (NAS: LRCX)	114.73%	42,421,067	478.02	68,011,234	60.3%
2019	SHOP	Shopify (TSE: SHOP)	185.15%	45,806,108	1,096.43	137,605,295	200.4%
2019	SNAP	Snap (NYS: SNAP)	196.37%	22,861,509	49.59	74,603,331	226.3%
2020	ADYEN	Adyen (AMS: ADYEN)	186.15%	70,949,641	2,343.09	69,128,392	
2020	NET	Cloudflare (NYS: NET)	345.43%	23,351,802	74.59	23,351,802	
2020	COUP	Coupa (NAS: COUP)	131.73%	24,461,235	335.92	24,461,235	
2020	CRWD	CrowdStrike (NAS: CRWD)	324.74%	46,868,085	200.49	46,868,085	
2020	DDOG	Datadog (NAS: DDOG)	160.56%	29,978,164	91.23	29,978,164	
2020	DOCU	DocuSign (NAS: DOCU)	199.96%	41,471,603	222.41	41,471,603	
2020	ENPH	Enphase Energy (NAS: ENPH)	571.53%	22,167,576	172.24	22,167,576	
2020		LG Electronics (KRX: 066575)	138.68%	23,287,760			
2020	MDB	MongoDB (NAS: MDB)	172.81%	21,638,019	350.41	21,638,019	
2020	NVDA	Nvidia (NAS: NVDA)	121.93%	323,241,800	524.54	323,241,800	
2020	OKTA	Okta (NAS: OKTA)	120.39%	32,918,046	250.67	32,918,046	
2020	PLTR	Palantir Technologies (NYS: PLTR)	147.89%	44,225,340	23.37	44,225,340	
2020	RNG	RingCentral (NYS: RNG)	124.68%	33,967,728	382.20	33,967,728	
2020	SHOP	Shopify (TSE: SHOP)	185.18%	137,415,370	1,096.43	137,605,295	
2020	SQ	Square (NYS: SQ)	247.89%	98,141,885	221.16	98,141,885	
2020	STNE	Stone Pagamentos (NAS: STNE)	110.38%	25,863,436	82.67	25,863,436	
2020	TTD	The Trade Desk (NAS: TTD)	208.34%	37,618,400	773.43	37,618,400	
2020		United Microelectronics Corporation (T	207.76%	20,998,003			
2020	U	Unity (NYS: U)	124.54%	41,556,148	144.08	41,556,148	
2020		Xiaomi Technology (HKG: 01810)	208.02%	107,372,671			
2020	ZM	Zoom Video Communications (NAS: Z	390.86%	96,475,899	359.98	96,475,899	
2020	ZS	Zscaler (NAS: ZS)	329.48%	26,799,456	196.09	26,799,456	

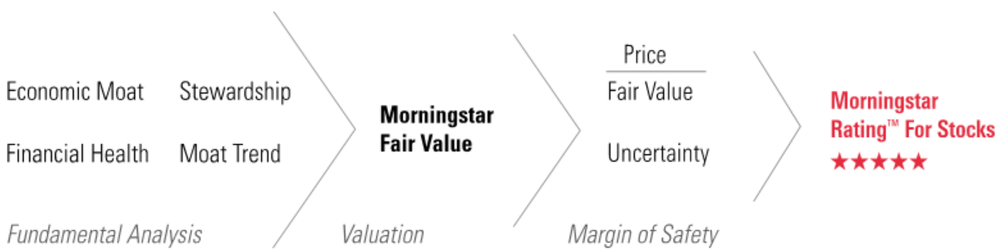
Source: Morningstar. Data as of Jan. 5, 2021

Research Methodology for Valuing Companies

Overview
At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, in-depth competitive advantage analysis, and a variety of other analytical tools to augment this process. Moreover, we think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (for example, mines), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss short-term market-price movements), but we believe these negatives are mitigated by deep analysis and our long-term approach.

Morningstar's equity research group ("we," "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate, in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Morningstar Research Methodology



Source: Morningstar.

Four key components drive the Morningstar rating: 1) our assessment of the firm's economic moat, 2) our estimate of the stock's fair value, 3) our uncertainty around that fair value estimate and 4) the current market price. This process ultimately culminates in our single-point star rating.

Economic Moat
The concept of an economic moat plays a vital role not only in our qualitative assessment of a firm's long-term investment potential, but also in the actual calculation of our fair value estimates. An economic moat is a structural feature that allows a firm to sustain excess profits over a long period of time. We define economic profits as returns on invested capital (or ROIC) over and above our estimate of a firm's cost of capital, or weighted average cost of capital (or WACC). Without a moat, profits are more susceptible to competition. We have identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Companies with a narrow moat are those we believe are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those in which we have very high confidence that excess returns will remain for 10 years, with excess returns more likely than not to remain for at least 20 years. The longer a firm generates economic profits, the higher its intrinsic value. We believe low-quality, no-moat companies will see their normalized returns gravitate toward the firm's cost of capital more quickly than companies with moats.

To assess the sustainability of excess profits, analysts perform ongoing assessments of the moat trend. A firm's moat trend is positive in cases where we think its sources of competitive advantage are growing stronger; stable where we don't anticipate changes to competitive advantages over the next several years; or negative when we see signs of deterioration.

Estimated Fair Value
Combining our analysts' financial forecasts with the firm's economic moat helps us assess how long returns on invested capital are likely to exceed the firm's cost of capital. Returns of firms with a wide economic moat rating are assumed to fade to the perpetuity

period over a longer period of time than the returns of narrow-moat firms, and both will fade slower than no-moat firms, increasing our estimate of their intrinsic value.

Our model is divided into three distinct stages:

Stage I: Explicit Forecast
In this stage, which can last five to 10 years, analysts make full financial statement forecasts, including items such as revenue, profit margins, tax rates, changes in working-capital accounts, and capital spending. Based on these projections, we calculate earnings before interest, after taxes, or EBI, and the net new investment, or NNI, to derive our annual free cash flow forecast.

Stage II: Fade
The second stage of our model is the period it will take the company's return on new invested capital—the return on capital of the next dollar invested, or RONIC—to decline (or rise) to its cost of capital. During the Stage II period, we use a formula to approximate cash flows in lieu of explicitly modeling the income statement, balance sheet, and cash flow statement as we do in Stage I. The length of the second stage depends on the strength of the company's economic moat. We forecast this period to last anywhere from one year (for companies with no economic moat) to 10–15 years or more (for wide-moat companies). During this period, cash flows are forecast using four assumptions: an average growth rate for EBI over the period, a normalized investment rate, average return on new invested capital (RONIC), and the number of years until perpetuity, when excess returns cease. The investment rate and return on new invested capital decline until a perpetuity value is calculated. In the case of firms that do not earn their cost of capital, we assume marginal ROICs rise to the firm's cost of capital (usually attributable to less reinvestment), and we may truncate the second stage.

Stage III: Perpetuity
Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with estimated WACC.

Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return to all capital providers—we discount future cash flows using the WACC, which is a weighted average of the costs of equity, debt, and preferred stock (and any other funding sources), using expected future proportionate long-term market-value weights.

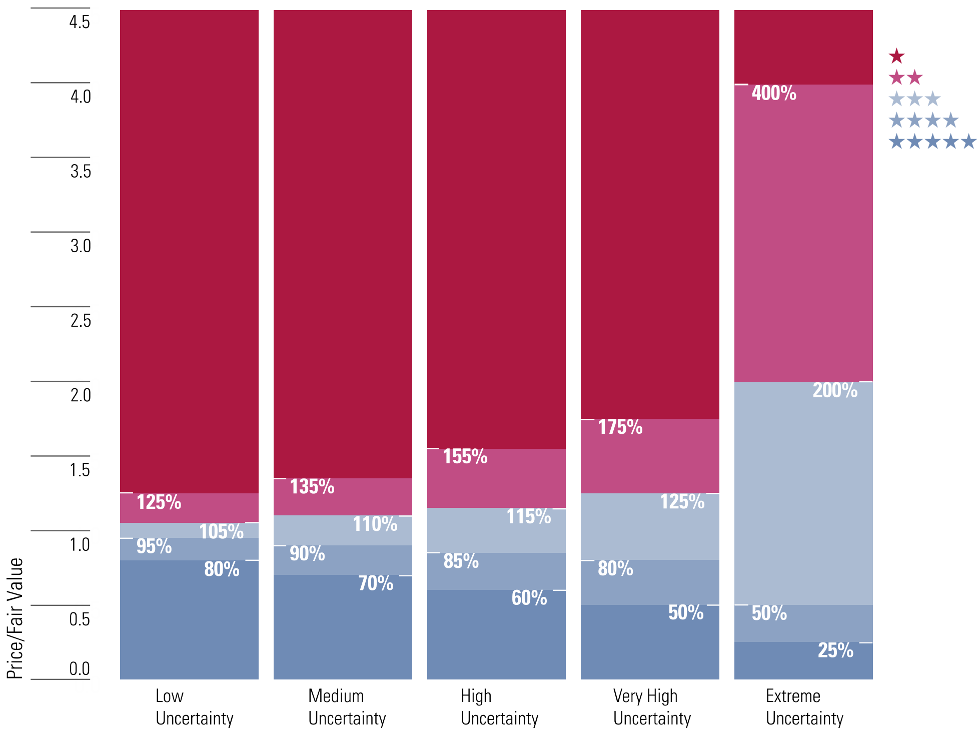
Uncertainty Around That Fair Value Estimate
Morningstar's Uncertainty Rating captures a range of likely potential intrinsic values for a company and uses it to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating represents the analysts' ability to bound the estimated value of the shares in a company around the Fair Value Estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, and other company-specific factors.

Analysts consider at least two scenarios in addition to their base case: a bull case and a bear case. Assumptions are chosen such that the analyst believes there is a 25% probability that the company will perform better than the bull case, and a 25% probability that the company will perform worse than the bear case. The distance between the bull and bear cases is an important indicator of the uncertainty underlying the fair value estimate.

Our recommended margin of safety widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the estimated value of the equity, the greater the discount we require relative to our estimate of the value of the firm before we would recommend the purchase of the shares. In addition, the uncertainty rating provides guidance in portfolio construction based on risk tolerance.

Our uncertainty ratings for our qualitative analysis are low, medium, high, very high, and extreme.
- Low–margin of safety for 5-star rating is a 20% discount and for 1-star rating is 25% premium.
- Medium–margin of safety for 5-star rating is a 30% discount and for 1-star rating is 35% premium.
- High–margin of safety for 5-star rating is a 40% discount and for 1-star rating is 55% premium.
- Very High–margin of safety for 5-star rating is a 50% discount and for 1-star rating is 75% premium.
- Extreme– margin of safety for 5-star rating is a 75% discount and for 1-star rating is 300% premium.

Morningstar Equity Research Star Rating Methodology



Market Price

The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

For more details about our methodology, please go to https://shareholders.morningstar.com.

Morningstar Star Rating for Stocks

Once we determine the fair value estimate of a stock, we compare it with the stock's current market price on a daily basis, and the star rating is automatically re-calculated at the market close on every day the market on which the stock is listed is open. Our analysts keep close tabs on the companies they follow, and, based on thorough and ongoing analysis, raise or lower their fair value estimates as warranted.

Please note, there is no predefined distribution of stars. That is, the percentage of stocks that earn 5 stars can fluctuate daily, so the star ratings, in the aggregate, can serve as a gauge of the broader market's valuation. When there are many 5-star stocks, the stock market as a whole is more undervalued, in our opinion, than when very few companies garner our highest rating.

We expect that if our base-case assumptions are true the market price will converge on our fair value estimate over time, generally within three years (although it is impossible to predict the exact time frame in which market prices may adjust).

Our star ratings are guideposts to a broad audience and individuals must consider their own specific investment goals, risk tolerance, tax situation, time horizon, income needs, and complete investment portfolio, among other factors.

The Morningstar Star Ratings for stocks are defined below:

★★★★★ We believe appreciation beyond a fair risk-adjusted return is highly likely over a multiyear time frame. Scenario analysis developed by our analysts indicates that the current market price represents an excessively pessimistic outlook, limiting downside risk and maximizing upside potential.

★★★★ We believe appreciation beyond a fair risk-adjusted return is likely.

★★★ Indicates our belief that investors are likely to receive a fair risk-adjusted return (approximately cost of equity).

★★ We believe investors are likely to receive a less than fair risk-adjusted return.

★ Indicates a high probability of undesirable risk-adjusted returns from the current market price over a multiyear time frame, based on our analysis. Scenario analysis by our analysts indicates that the market is pricing in an excessively optimistic outlook, limiting upside potential and leaving the investor exposed to Capital loss.

Risk Warning

Please note that investments in securities are subject to market and other risks and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not be sustained in future and is no indication of future performance. A security investment return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost. A security's current investment performance may be lower or higher than the investment performance noted within the report. Morningstar's Uncertainty Rating serves as a useful data point with respect to sensitivity analysis of the assumptions used in our determining a fair value price.

General Disclosure

Unless otherwise provided in a separate agreement, recipients accessing this report may only use it in the country in which the Morningstar distributor is based. Unless stated otherwise, the original distributor of the report is Morningstar Research Services LLC, a U.S.A. domiciled financial institution.

This report is for informational purposes only and has no regard to the specific investment objectives, financial situation, or particular needs of any specific recipient. This publication is intended to provide information to assist institutional investors in making their own investment decisions, not to provide investment advice to any specific investor. Therefore, investments discussed and recommendations made herein may not be suitable for all investors; recipients must exercise their own independent judgment as to the suitability of such investments and recommendations in the light of their own investment objectives, experience, taxation status, and financial position.

The information, data, analyses, and opinions presented herein are not warranted to be accurate, correct, complete, or timely. Unless otherwise provided in a separate agreement, neither Morningstar, Inc. nor the Equity Research Group represents that the report contents meet all of the presentation and/or disclosure standards applicable in the jurisdiction the recipient is located.

Except as otherwise required by law or provided for in a separate agreement, the analyst, Morningstar, Inc. and the Equity Research Group and their officers, directors and employees shall not be responsible or liable for any trading decisions, damages or other losses resulting from, or related to, the information, data, analyses or opinions within the report. The Equity Research Group encourages recipients of this report to read all relevant issue documents for example, prospectus) pertaining to the security concerned, including without limitation, information relevant to its investment objectives, risks, and costs before making an investment decision and when deemed necessary, to seek the advice of a legal, tax, and/or accounting professional.

The Report and its contents are not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country, or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would subject Morningstar, Inc. or its affiliates to any registration or licensing requirements in such jurisdiction.

Where this report is made available in a language other than English and in the case of inconsistencies between the English and translated versions of the report, the English version will control and supersede any ambiguities associated with any part or section of a report that has been issued in a foreign language. Neither the analyst, Morningstar, Inc., nor the Equity Research Group guarantees the accuracy of the translations.

This report may be distributed in certain localities, countries and/or jurisdictions ("Territories") by independent third parties or independent intermediaries and/or distributors ("Distributors"). Such Distributors are not acting as agents or representatives of the analyst, Morningstar, Inc. or the Equity Research Group. In Territories where a Distributor distributes our report, the Distributor is solely responsible for complying with all applicable regulations, laws, rules, circulars, codes, and guidelines established by local and/or regional regulatory bodies, including laws in connection with the distribution third-party research reports.

Conflicts of Interest

- No interests are held by the analyst with respect to the security subject of this investment research report.

  Morningstar, Inc. may hold a long position in the security subject of this investment research report that exceeds 0.5% of the total issued share capital of the security. To determine if such is the case, please click http://msi.morningstar.com and http://mdi.morningstar.com.

- Analysts' compensation is derived from Morningstar, Inc.'s overall earnings and consists of salary, bonus and in some cases restricted stock.

- Neither Morningstar, Inc. nor the Equity Research Group receives commissions for providing research nor do they charge companies to be rated.

- Neither Morningstar, Inc. nor the Equity Research Group is a market maker or a liquidity provider of the security noted within this report.

- Neither Morningstar, Inc. nor the Equity Research Group has been a lead manager or co-lead manager over the previous 12 months of any publicly disclosed offer of financial instruments of the issuer.

- Morningstar, Inc.'s investment management group does have arrangements with financial institutions to provide portfolio management/investment advice some of which an analyst may issue investment research reports on. However, analysts do not have authority over Morningstar's investment management group's business arrangements nor allow employees from the investment management group to participate or influence the analysis or opinion prepared by them.

- Morningstar, Inc. is a publicly traded company (Ticker Symbol: MORN) and thus a financial institution the security of which is the subject of this report may own more than 5% of Morningstar, Inc.'s total outstanding shares. Please access Morningstar, Inc.'s proxy statement, "Security Ownership of Certain Beneficial Owners and Management" section http://investorrelations.morningstar.com/sec.cfm?doctype=Proxy&year=&x=12

- Morningstar, Inc. may provide the product issuer or its related entities with services or products for a fee and on an arms' length basis including software products and licenses, research and consulting services, data services, licenses to republish our ratings and research in their promotional material, event sponsorship and website advertising.

Further information on Morningstar, Inc.'s conflict of interest policies is available from http://global.morningstar.com/equitydisclosures. Also, please note analysts are subject to the CFA Institute's Code of Ethics and Standards of Professional Conduct.

For a list of securities which the Equity Research Group currently covers and provides written analysis on please contact your local Morningstar office. In addition, for historical analysis of securities covered, including their fair value estimate, please contact your local office.

For Recipients in Australia: This Report has been issued and distributed in Australia by Morningstar Australasia Pty. Ltd. (ABN: 95 090 665 544; ASFL: 240892). Morningstar Australasia Pty. Ltd. is the provider of the general advice ("the Service") and takes responsibility for the production of this report. The Service is provided through the research of investment products. To the extent the Report contains general advice it has been prepared without reference to an investor's objectives, financial situation or needs. Investors should consider the advice in light of these matters and, if applicable, the relevant Product Disclosure Statement before making any decision to invest. Refer to our Financial Services Guide, or FSG, for more information at http://www.morningstar.com.au/fsg.pdf.

For Recipients in Hong Kong: The Report is distributed by Morningstar Investment Management Asia Limited, which is regulated by the Hong Kong Securities and Futures Commission to provide services to professional investors only. Neither Morningstar

Investment Management Asia Limited, nor its representatives, are acting or will be deemed to be acting as an investment advisor to any recipients of this information unless expressly agreed to by Morningstar Investment Management Asia Limited. For enquiries regarding this research, please contact a Morningstar Investment Management Asia Limited Licensed Representative at http://global.morningstar.com/equitydisclosures.

For Recipients in India: This Investment Research is issued by Morningstar Investment Adviser India Private Limited. Morningstar Investment Adviser India Private Limited is registered with the Securities and Exchange Board of India (Registration number INA000001357) and provides investment advice and research. Morningstar Investment Adviser India Private Limited has not been the subject of any disciplinary action by SEBI or any other legal/regulatory body. Morningstar Investment Adviser India Private Limited is a wholly owned subsidiary of Morningstar Investment Management LLC. In India, Morningstar Investment Adviser India Private Limited has one associate, Morningstar India Private Limited, which provides data related services, financial data analysis and software development. The Research Analyst has neither served as an officer, director or employee of the fund company within the last 12 months, nor has it or its associates engaged in market making activity for the fund company.

*The Conflicts of Interest disclosure above also applies to relatives and associates of Manager Research Analysts in India. The Conflicts of Interest disclosure above also applies to associates of Manager Research Analysts in India. The terms and conditions on which Morningstar Investment Adviser India Private Limited offers Investment Research to clients, varies from client to client, and are detailed in the respective client agreement.

For recipients in Japan: The Report is distributed by Ibbotson Associates Japan, Inc., which is regulated by Financial Services Agency. Neither Ibbotson Associates Japan, Inc., nor its representatives, are acting or will be deemed to be acting as an investment advisor to any recipients of this information.

For recipients in Singapore: For Institutional Investor audiences only. Recipients of this report should contact their financial adviser in Singapore in relation to this report. Morningstar, Inc., and its affiliates, relies on certain exemptions (Financial Advisers Regulations, Section 32B and 32C) to provide its investment research to recipients in Singapore.

About Morningstar® Institutional Equity Research™
Morningstar Institutional Equity Research provides independent, fundamental equity research differentiated by a consistent focus on sustainable competitive advantages, or Economic Moats.

For More Information
+1 312 696-6869
equitysupport@morningstar.com

MORNINGSTAR®

22 West Washington Street
Chicago, IL 60602 USA

©2021 Morningstar. All Rights Reserved. Unless otherwise provided in a separate agreement, you may use this report only in the country in which its original distributor is based. The information, data, analyses, and opinions presented herein do not constitute investment advice; are provided solely for informational purposes and therefore are not an offer to buy or sell a security; and are not warranted to be correct, complete, or accurate. The opinions expressed are as of the date written and are subject to change without notice. Except as otherwise required by law, Morningstar shall not be responsible for any trading decisions, damages, or other losses resulting from, or related to, the information, data, analyses, or opinions or their use. References to "DBRS Morningstar credit ratings" refer to credit ratings issued by one of the DBRS group of companies or Morningstar Credit Ratings, LLC. The DBRS group of companies consists of DBRS, Inc. (Delaware, U.S.)(NRSRO, DRO affiliate); DBRS Limited (Ontario, Canada)(DRO, NRSRO affiliate); DBRS Ratings GmbH (Frankfurt, Germany)(CRA, NRSRO affiliate, DRO affiliate); and DBRS Ratings Limited (England and Wales)(CRA, NRSRO affiliate, DRO affiliate). Morningstar Credit Ratings, LLC is a NRSRO affiliate of DBRS, Inc. For more information on regulatory registrations, recognitions and approvals of DBRS group of companies and Morningstar Credit Ratings, LLC, please see: http://www.dbrsmorningstar.com/research/highlights.pdf.

The DBRS group and Morningstar Credit Ratings, LLC are wholly owned subsidiaries of Morningstar, Inc.

All DBRS Morningstar credit ratings and other types of credit opinions are subject to disclaimers and certain limitations. Please read these disclaimers and limitations at http://www.dbrsmorningstar.com/about/disclaimer and https://ratingagency.morningstar.com/mcr. Additional information regarding DBRS Morningstar ratings and other types of credit opinions, including definitions, policies and methodologies, are available on http://www.dbrsmorningstar.com and https://ratingagency.morningstar.com/mcr.

Investment research is produced and issued by subsidiaries of Morningstar, Inc. including, but not limited to, Morningstar Research Services LLC, registered with and governed by the U.S. Securities and Exchange Commission. The information contained herein is the proprietary property of Morningstar and may not be reproduced, in whole or in part, or used in any manner, without the prior written consent of Morningstar. To license the research, call +1 312 696-6869.