NORTHERN TRUST

INVESTMENT STRATEGY COMMENTARY

JUSTIFIED ENTHUSIASM

BIG CAP TECH STOCKS HAVE DOMINATED MARKET RETURNS; ECONOMIES START TO AWAKEN; VACCINE OUTLOOK UPDATE

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Northern Trust Global Asset Allocation

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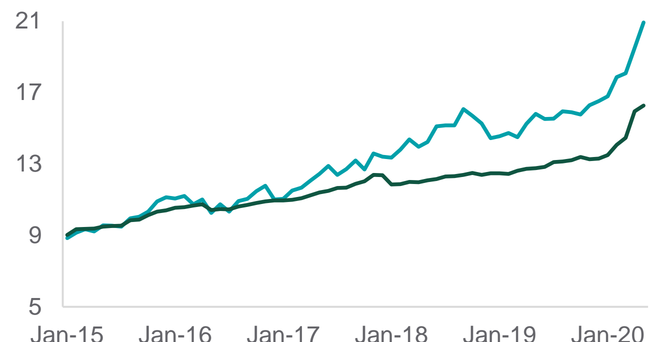
There has been increasing focus on whether the U.S. stock market is too "top heavy," with an over-reliance on the top technology stocks. We think business fundamentals should alleviate those concerns. Meanwhile, we are starting to see the earliest of signs of a restarting of the U.S. economy. Finally, COVID-19 vaccine progress has generated a lot of news but we still do not expect broad availability before mid-2021.

While the last eight weeks have seen extraordinary developments on the monetary and fiscal policy front, the world economy has understandably lagged under the weight of broad social distancing restrictions. With those starting to be gradually lifted across many important economies, we are starting to see the first signs of improvement in various real-time economic measures. As shown in Exhibit 2, financial conditions improved sharply due to policy support — which will have a lagged beneficial impact on the real economy. The industrial economy in the U.S. started to wake up before the consumer, as electricity usage has been improving for over a month and steel production is now turning up. Airline bookings are starting to improve (while still at terribly depressed levels), as have restaurant reservations. The improvement over the next several months should be relatively easy — but as shown by Ford Motor Company's start-stop-start experience this week with two of its auto plants, it will not be a simple experience. The true test of the economic recovery will occur if we encounter a sustained upturn in COVID-19 cases — either due to relaxation of social distancing practices during the reopening or because of a second wave this fall or winter.

EXHIBIT 1: BUBBLE REDUX?

Strong fundamentals, acceptable valuations offset risk of repeating the past.



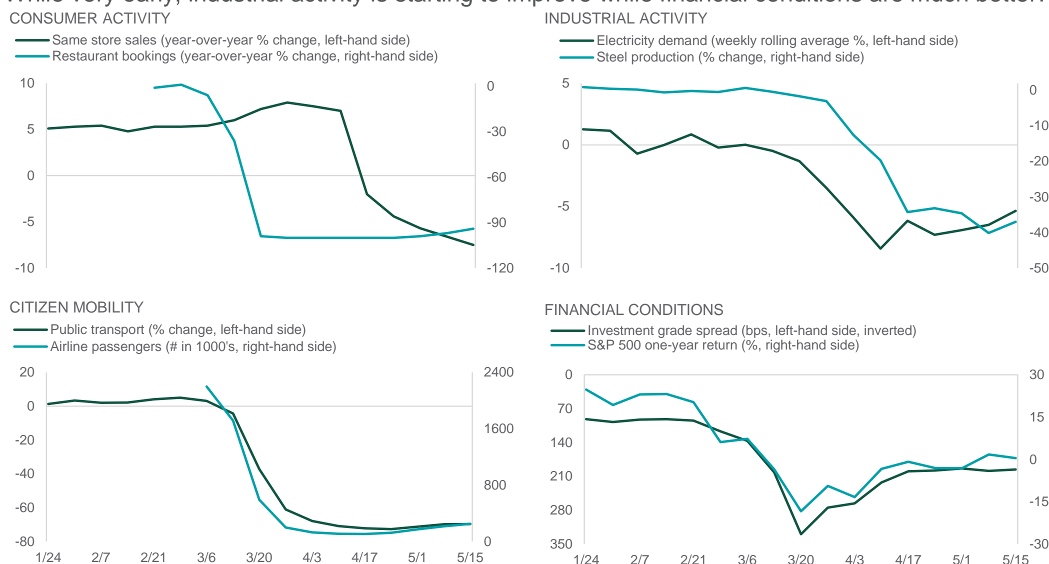
Source: Northern Trust Asset Management, FactSet, Bloomberg. Top five companies % of S&P 500 measured by market capitalization using month-end values from 4/30/1970 through 4/30/2020. Big Tech % weight and earnings measured by market capitalization and net income, respectively, using market capitalization-weighted monthly data from 1/20/2015 through 5/20/2020. Big Tech includes Microsoft, Amazon, Apple, Alphabet and Facebook. Current top five companies are Big Tech.

IS THE MARKET TOO RELIANT ON BIG TECH?

Big Tech — in this report referring to Microsoft, Apple, Amazon, Google (Alphabet) and Facebook — has outperformed the S&P 500 for years, offering investors both secular growth opportunities as well as defensive characteristics like strong balance sheets and free cash flow to weather the storm. Index returns have been strongly supported by these stocks, but it has actually abated during the recent recovery. By our calculations, Big Tech has contributed about 7 percentage points of the S&P 500's 31% bounce off the lows on March 23, which is 21% of the total return and in line with the stocks' market capitalization. Over the 3-year and 5-year periods, Big Tech accounted for about half of the market's performance. On a valuation basis, with an estimated price to earnings ratio of 27x, Big Tech trades at a 28% premium to the S&P 500's 21x multiple, which in our view is justified given secular growth drivers and strong margins, high free cash flow and strong balance sheets. Big Tech's 21% weight in the index is also not far out of line with its contribution to index net income, at ~17% (Exhibit 3).

EXHIBIT 2: SIGNS OF ECONOMIC STIRRING

While very early, industrial activity is starting to improve while financial conditions are much better.



Source: Northern Trust Asset Management, Bloomberg, Johnson Redbook same store sales, Open Table restaurant bookings, Moovit, Transportation Security Administration. Weekly data for U.S. only through 5/15/2020. Price return shown for S&P 500. Past performance does not guarantee future results.

In response to the COVID-19 crisis, these companies have cumulatively donated billions of dollars to food banks, health initiatives and small businesses, plus personal protective equipment for front line workers. Without a doubt, they are working to improve their image with governments, regulators and citizens as scrutiny of their business models has risen in recent years. A critical common denominator for Big Tech is that they all operate on 100% cloud architectures, which enable business agility and favorable unit economics to a greater degree than legacy business models. Big Tech's collective response to this crisis stands out in that each company is investing in this time of uncertainty when others have had to pull back. The difference between cloud-based digital business models and legacy business models has never been more obvious. While these companies are not immune to the macro dislocations caused by the virus, we think they are each well positioned to rebound quickly once the economy improves. We expect that post-COVID-19, enterprises will accelerate their digital transformation initiatives, which are based on cloud

computing architectures, to reduce business risk, improve business resiliency, lower operational costs and enable digital business models with a direct connection to consumers.

EXHIBIT 3: BIG CONTRIBUTORS

While Big Tech has dominated longer-term returns, the recent rally has been more broad-based.

Index/Stock	Recent low-to-date		Year-to-date		1-year		3-year		5-year	
	Return (%)	Contrib (%)	Return (%)	Contrib (%)	Return (%)	Contrib (%)	Return (%)	Contrib (%)	Return (%)	Contrib (%)
S&P 500	31	31	(9)	(9)	4	4	27	27	41	41
Apple	40	2	7	0	68	2	113	3	161	4
Amazon	29	1	33	1	31	1	155	3	481	4
Facebook	46	1	6	0	17	0	46	1	169	2
Alphabet (Class C)	30	0	3	0	18	0	47	1	156	1
Alphabet (Class A)	30	0	3	0	18	0	44	1	150	1
Microsoft	35	2	17	1	45	2	184	4	325	6
	Subtotal	7	Subtotal	3	Subtotal	6	Subtotal	12	Subtotal	18
Big Tech (% of Total)		21%				139%		45%		45%

Source: Northern Trust Asset Management, FactSet. Recent low on March 23, 2020. Contrib = absolute contribution to S&P 500 return. Cumulative returns shown. Big tech includes companies shown in table. Data as of 5/19/2020.

A HISTORICAL PERSPECTIVE

While the current concentration of the top five market capitalization stocks seems high at over 20%, there is historical precedence. The two periods of prior peaks, however, were also periods of investor excess — the "Nifty Fifty" era of the 1960s and 1970s, and the Technology Stock Bubble of the late 1990s. With company fundamentals strong and the secular growth stories intact, the biggest risk to this group of stocks may be regulations focused on decreasing their market power. Below we run through a review of the current fundamental picture for each of these companies, and how they are navigating the COVID-19 business environment.

EXHIBIT 4: REACHING HEIGHTS LAST SEEN IN THE 1970'S

Business cycle dynamics lead to different market leadership.

1970	1980	1990	2000	2010	Current
IBM 7.1%	IBM 3.8%	IBM 2.9%	Microsoft 4.9%	Exxon Mobil 3.3%	Microsoft 5.8%
AT&T 5.2%	AT&T 3.5%	Exxon Mobil 2.9%	General Electric 4.1%	Microsoft 2.4%	Apple 5.4%
General Motors 4.5%	Exxon Mobil 3.4%	General Electric 2.3%	Cisco Systems 2.9%	Apple 1.9%	Amazon 4.2%
Exxon Mobil 3.2%	Standard Oil 2.3%	Altria Group 2.2%	Walmart 2.5%	Johnson & Johnson 1.8%	Alphabet 3.4%
Kodak 2.4%	Schlumberger 2.2%	Royal Dutch Petroleum 1.9%	Exxon Mobil 2.3%	Procter & Gamble 1.8%	Facebook 2.2%
Top 5 22.4%	Top 5 15.2%	Top 5 12.2%	Top 5 16.7%	Top 5 11.2%	Top 5 21.0%

Source: Northern Trust Asset Management, Bloomberg. Weights shown for top five largest companies as a % of S&P 500 market cap. Weights of companies with multiple share classes summed. End-of-year values for 1970, 1980, 1990; beginning-of-year values for 2000, 2010. Current as of 5/19/2020.

COMPANY PERFORMANCE DURING COVID-19

Microsoft (MSFT – 1/A-rated): The company reported strong fiscal third quarter 2020 results, benefiting from strong growth in Cloud products (40% year-over-year [y/y]), especially in

productivity solutions like Teams, which grew to 75 million users from 20 million in November. Microsoft has seen strong cloud traction with large enterprises, where it can offer an on-ramp from its legacy products to the cloud, as well as a modern open source development environment for next generation applications. The company guided its fiscal fourth quarter 2020 to a slower revenue growth rate (10% y/y versus 16% y/y last quarter), as it expects pressure on consumer and enterprise technology spending, but earnings per share revisions are relatively flat and much better than the overall market. Our thesis on Microsoft is based on the growing mix of Cloud, which accounts for 38% of total revenue and is driving double-digit earnings per share and free cash flow growth.

Facebook (FB – 1/C-rated): This is Facebook's first macro downturn as a public company. Digital ads were more than half of the advertising market for the first time in 2019, compared to single-digit percentages in the last recession. Analysts cut estimates aggressively ahead of first quarter 2020 reports, and the results were better than feared. Facebook's ad revenue grew 19% y/y in the first quarter of 2020, compared to 26% in the fourth quarter of 2019 and 30% in 2019, excluding currency impacts. User engagement improved across all regions, with Total Monthly Active People across all of Facebook's apps up 11% y/y to 2.99 billion as people connected to family and friends during shelter-in-place restrictions. Advertiser spending broadly weakened in March as lockdowns expanded, especially in hard-hit industries like travel and auto, but stabilized in April. Margins are lower y/y due to continued investments in new services, platform safety and 10,000 new hires in 2020 – and management sees slower growth on weak advertising spending in coming quarters. However, we think digital advertising is likely more resilient than other advertising. The dynamic ad auction, real-time ad tech stack and direct response ads all help advertisers quickly adapt to changing consumer behavior and generate a positive return on their ad spending, which are important advantages over traditional advertising. We see continued monetization opportunities for Facebook's properties, as more of the 140,000 small businesses on Facebook build out digital marketing and e-commerce capabilities. Note: the "C" quality code reflects CEO Mark Zuckerberg's voting control.

Amazon (AMZN – 1/B-rated): Amazon is benefiting from accelerating e-commerce trends during COVID-19 lockdowns, garnering a larger share of consumer wallets. First quarter 2020 revenue grew 27% y/y compared to estimates for 23% growth, which accelerated from 22% in 2019. Second quarter 2020 guidance was for 23% y/y revenue growth. However, costs are also much higher, with shipping costs up 49% y/y in what is usually a seasonally slow quarter after the winter holiday season, and compares to 21% y/y growth in the first quarter of 2019. Headcount grew 33% y/y as Amazon hired 175,000 people in a six week period in March and April to meet higher demand levels. The company plans to spend about $4 billion in the second quarter of 2020 — or all of its pre-COVID-19 projected operating profit in the quarter — on additional safety measures for employees (new procedures which lower productivity) and employee testing, where it built its own testing labs. The Amazon Web Services cloud computing business is at a $40 billion annualized run rate and grew 33% y/y in the first quarter of 2020, with operating margins in the mid-20% range. Our thesis for Amazon is based on strong double-digit growth in earnings per share and free cash flow driven by the growing mix of higher margin Amazon Web Services and advertising businesses, along with improving leverage following heavy investments in its retail business.

Apple (AAPL – 2/A-rated): The company executed well in its March fiscal second quarter of 2020, given its supply chain concentration in China, which was shut down due to COVID-19 in February but back to normal levels by the end of March. Recall that the company pulled its March quarter guidance in mid-February on COVID-19 supply chain disruption and store closures in China. As

China recovered in March, Apple shut down the rest of its stores as the virus spread worldwide. Total revenue grew 1% y/y, reflecting a 7% decline in iPhone revenue, 17% growth in Services and 23% growth in Wearables. Margins are under pressure as the company continues to invest in its new product pipeline, offset by aggressive share buybacks (shares declined 6% y/y) to drive earnings growth. While Apple is a good defensive holding, we are 2/A coded given our more muted outlook for the upcoming 5G iPhone cycle — with a later launch and higher price points versus competitors — and new pressures on consumer spending related to COVID-19 job losses.

Alphabet (GOOG – 1/C-rated): Like Facebook, Alphabet saw weak advertising trends exiting the March quarter, with some stabilization in April. Total Alphabet properties ad revenue grew 12% y/y, with Search up 9% and YouTube up 33%, which was better than many analyst forecasts of 20-30% declines. Usage exploded in the quarter, but with fewer commercial queries. While not guiding, management expects continued weakness in ad spending through 2020, especially in highly impacted industries such as retail, travel, hospitality and auto. Alphabet's Cloud business is at an $11 billion annual run rate, growing 52% y/y in the first quarter of 2020, gaining traction with enterprises, especially those with artificial intelligence/machine learning-specific workloads. Alphabet is moderating its spending, investing in long-term priorities like cloud and artificial intelligence/machine learning while optimizing costs in other areas, including slower hiring. Given the company's real-time view into consumer behavior, coupled with a dynamic ad tech stack and highly measurable direct response ad formats, management is confident that its ad business will rebound sharply as the economy bounces back. With several secular tailwinds and long-term optionality around Other Bets (Verily in healthcare, Waymo in autonomous driving), plus a reasonable valuation, we rate the shares 1/C (the "C" quality code reflects founders' voting control).

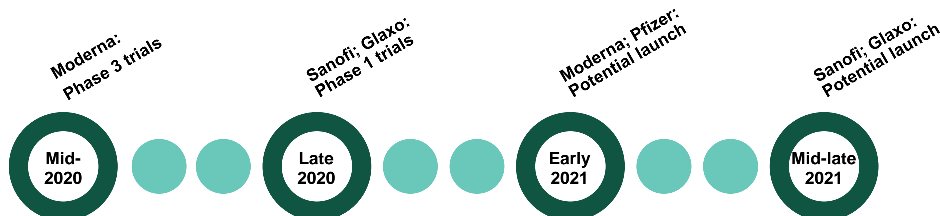
PROGRESS ON THE COVID-19 TREATMENT FRONT

The pharmaceutical industry has put substantial resources into producing a vaccine for COVID-19, and there are currently more than 100 programs underway. The companies pursuing these programs include some of the world's largest vaccine manufacturers including GlaxoSmithKline (Glaxo), Sanofi, Pfizer and Merck, in addition to emerging biotechnology companies including Moderna and BioNTech. There are significant challenges in developing a vaccine for COVID-19, including the fact that there are no currently licensed vaccines for a human coronavirus, effectiveness is difficult to prove during a pandemic and there are technical hurdles to manufacturing and distributing millions of doses of a new vaccine. Despite the challenges, the unprecedented scale and collaboration of the effort is encouraging, with companies such as Pfizer committing $1 billion to its program, and Johnson & Johnson jointly committing approximately $1 billion together with the U.S. government.

The companies pursuing vaccines are employing multiple technology platforms, some of which have never been approved in humans. Glaxo and Sanofi, two of the largest producers of the seasonal flu vaccine, have partnered on a COVID-19 vaccine program in which they will combine their advanced technologies. Sanofi will contribute its cellular technology for rapid manufacturing and Glaxo will supply its modern vaccine adjuvant, which is used to boost the immune response. In this program, the companies are employing a traditional protein-based strategy, which is used in many currently licensed vaccines. Other companies are pursuing novel vaccine technologies, including Moderna and Pfizer, who is partnered with BioNTech. These companies are using a strategy in which the genetic code of the target is injected in a form known as mRNA, causing human cells to produce a replication of the viral protein, which in turn could elicit a protective immune response. This week, Moderna announced its first Phase 1 clinical data in human healthy volunteers, demonstrating that its vaccine can elicit the development of antibodies. While we see

this news as positive, there are many questions to be answered and clinical hurdles to be achieved. Even if proven safe in small Phase 1 studies, all of these companies will need to run Phase 2 and Phase 3 studies to demonstrate that their vaccine is safe in thousands of individuals, and that it can protect individuals from COVID-19 infection.

EXHIBIT 5: VACCINE TIMETABLE



Source: FactSet, company announcements. Expected events shown for Moderna, GlaxoSmithKline (Glaxo), Pfizer and Sanofi only, based on public commentary from company management.

We believe that the demonstration of safety is paramount for the development of a vaccine to COVID-19. Unlike the development of a drug which is used to treat an existing disease, vaccines are used in otherwise healthy individuals to prevent disease. In the case of COVID-19, a vaccine could be used in millions or even billions of individuals, highlighting an extremely high bar for safety. Adverse events can take many months to appear and might only be noticed when the vaccine is given to many thousands of individuals. For example, in 2017, Sanofi's vaccine for Dengue virus was shown to increase the risk of severe infection in certain populations after it had already been launched in the Philippines. We believe safety questions will be amplified for a completely novel vaccine technology such as Moderna's.

In March, Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases in the U.S., stated that a reasonable timeline for a vaccine to become available is 12-18 months, implying March to September of 2021. Moderna estimates it could have emergency authorization before the end of 2020, and it could manufacture tens of millions of doses per month by the end of 2020, increasing to a rate of greater than one billion doses per year. Glaxo and Sanofi anticipate they could be approved in the second half of 2021 and could expand their manufacturing capacity to more than one billion doses per year. We note that timelines for vaccine development are usually estimated in years, and when Merck launched its vaccine for Ebola, it was five years after the outbreak of 2014. Even if a working vaccine is launched, it is unclear what percent of the public will be willing to take a vaccine without long-term safety data. A poll of Americans conducted by Reuters in May indicated that 24% were not interested in taking a vaccine for COVID-19, with half of those respondents worrying about the speed of development. Another potential hurdle could be the effectiveness of an approved vaccine, and we note that the vaccine for seasonal flu is only 40-60% effective in some years, according to the Centers for Disease Control and Prevention. Although we consider a vaccine to be achievable, we believe the timelines and expectations are optimistic. Instead, we believe that public health measures are more likely to curtail the pandemic over the next 12-18 months, with a successful drug or vaccine providing an upside surprise.

CONCLUSION: A MORE BALANCED RISK/REWARD OUTLOOK

Our view is that the significant rally in global equities over the last eight weeks has reduced the relative attractiveness of risk assets and put the upside/downside risk cases in better balance. On the upside, tremendous policy support has been activated — much of the impact has benefitted the financial markets and will start to help the real economy. On the health policy front, innovation is happening at breakneck speed — and early stage progress is being reported. We also might be fortunate, and not have a significant second wave of COVID-19 cases to hurt economic growth. On the downside, much of the tremendous policy support has already been implemented and reflected in financial markets through increased valuations. Medical innovation, while accelerated relative to history, might lag in its ability to address a second wave. We worry about this risk as we don't expect broad availability of a vaccine before mid-2021 so we will be vulnerable to further social distancing constraints in the case of a second wave. Earlier this month, we moved to a neutral tactical risk position in our global policy model in the wake of a more balanced risk/reward outlook in the markets. We will be paying special attention to the health data in coming months as that will likely be the most important driver of economic growth and financial markets over the next one-to-two years.

Special thanks to Tom O'Shea and Colin Cheesman, Investment Analysts, for data research.

Note: The ratings on equities covered by Northern Trust are composed of two components: a timing code and an investment code. The timing code indicates our view of the attractiveness of a company's common stock relative to its sector on a total return basis. The investment code represents an evaluation of a company's basic longer-term fundamental merits relative to its economic sector.

Timing Code:

- **1: Outperform** The stock is expected to outperform its sector over the next 12-18 months.
- **2: Market-perform** The stock is expected to perform in-line with its sector over the next 12-18 months.
- **3: Underperform** The stock is expected to underperform its sector over the next 12-18 months.

Investment Code:

- **A: Above-average** Above-average investment characteristics relative to the economic sector.
- **B: Average** Average investment characteristics relative to the economic sector.
- **C: Below-average** Below-average investment characteristics relative to the economic sector.

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