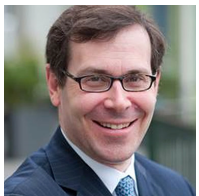


STOCK PICKING IN BIG TECH

Overvaluation concerns underscore the importance of an active approach

As we look at the current market environment, large-cap technology companies have been the main driving force behind performance this year. Obviously, it's been a volatile year thus far, with the S&P 500 Index, NASDAQ and Russell 2000 Index returning 3%, 21% and -10%, respectively. In those three numbers, you get a sense of the extreme spread between different parts of the market's performance. The S&P 500 Index's positive performance has been mainly driven by large-cap tech companies, while the Russell 2000 Index of small-cap companies is reflecting the challenged environment from the pandemic-driven slowdown.



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Chief Investment Officer

One notion we are considering is whether the market is ahead of itself. And is that why the correction happened, given the challenges in the economy as a result of the shutdown? As we look at the data right now, we see strong fundamentals supporting the leadership of large technology

companies. We believe the National Bureau of Economic Research will officially proclaim the end of the recession, eventually making it one of the shortest on record. Historically, if you look at prior recessions, the duration of the recession is proportional and a link to the nature of the recovery. The shorter the recession, the quicker and more robust the recovery. Given the extremely short, albeit severe nature of this slowdown, we think a V-shaped rebound is in the offing and strong market performance broadly is consistent with that view.

When we look at valuations, 77% of the S&P 500 Index constituents have earnings yields higher than the 10-year U.S. Treasury yield. Additionally, double-digit trillions of dollars of global bond are trading at negative yields, while U.S. real rates are negative. So, on a relative basis, leading businesses that can grow, despite this slowdown, are demonstrating strength and driving the market rebound, which is what technology companies are illustrating.

As we discuss more deeply the fundamental performance and valuations in this area, we will also focus on the business models and the asset-light advantages of

these mega-cap tech businesses. We will consider the regulatory issues, political issues and the social license to operate. These issues fit into what's being increasingly called environmental, social and governance (ESG). So, we'll be discussing key issues for a big part of the market.

We met with Brad Warden, CFA, co-portfolio manager of the Ivy Science and Technology Fund, to talk about the fundamentals, valuations and business models of the leading large-cap tech companies.

Q: To kick things off, Brad, the fundamentals have been quite strong for mega-cap technology businesses. What's your response to the belief that valuations are ahead of themselves in a nosebleed market, or do you think this is more of a rational situation in terms of market leadership?

Warden: A lot of parallels are being drawn between today's tech valuations and the valuations in the late-1990s. We take a different view on that — the underlying business models of the large tech companies that are doing well are different than what was occurring in the late 1990s. Based on the margin structures and cash flows of today's leading technology companies — I would argue that these businesses were undervalued earlier in the year and during the selloff in March. Additionally, I think the resilience of the business models, the management acumen, the ability to deal with the changing environment and the utilization of technology across those models was being underappreciated. This is becoming clearer as we continue to work through the pandemic.

We've obviously seen the stocks of large tech companies get bid up, but I don't see extreme valuations. I'd argue we're closer to fairly valued today. Now it's a matter of looking forward on a sustainable basis and evaluating future growth along with the underlying risks to the business models. We believe these companies continue to be leaders not only in technology, but across the economy and in the markets. The bottom line is that while the valuations have moved up, we continue to be comfortable owning large tech names.

The below matrix illustrates the lower stock price correlations of some of the largest technology companies. While positively correlated in many cases, due to being in the broader Information Technology sector, the median correlations of approximately 0.5 over the past five years illustrates the significant opportunity for active, fundamental stock-picking. Additionally, it further highlights how different the business models and fundamentals are within the group. This matrix shows the median correlations of free cash flow growth across this group to be around 0 — highlighting the uncorrelated nature of the company financial models themselves.

5-YEAR MEDIAN CORRELATION TO OTHER BIG TECH STOCKS

	Price	Free Cash Flow Growth	Earnings Per Share Growth	Sales Growth
AAPL	0.57	0.01	0.10	0.07
AMZN	0.57	-0.08	0.03	0.19
MSFT	0.67	-0.12	-0.12	0.17
GOOG	0.64	-0.12	-0.03	0.16
FB	0.57	0.01	0.03	0.29
TSM	0.50	-0.08	0.01	0.07
TSLA	0.37	0.06	0.03	0.07
NVDA	0.52	-0.08	0.04	0.30
ADBE	0.62	-0.21	-0.06	0.05
CRM	0.56	-0.07	0.07	0.01
PYPL	0.59	-0.13	-0.10	0.16
NFLX	0.46	0.02	0.05	0.40

Source: Bloomberg, FactSet. "Other Big Tech Stocks" include all stocks listed. Date range: 08/31/2015-08/31/2020. AAPL: Apple, Inc.; AMZN: Amazon.com, Inc.; MSFT: Microsoft, Corp.; GOOG: Alphabet, Inc.; FB: Facebook, Inc.; TSM: Taiwan Semiconductor Mfg. Co. Ltd.; TSLA: Tesla, Inc.; NVDA: NVIDIA, Corp.; ADBE: Adobe, Inc.; CRM: Salesforce.com; PYPL: PayPal Holdings, Inc.; NFLX: Netflix, Inc.

Q: One of the pushbacks to that view would be the notion that Big Tech is way over their skis and getting ahead of themselves. In contrast to this thinking, these companies have quite different business models. What's your reaction to that view?

Warden: Evaluating big technology stocks in a singular fashion is dangerous, we think you should look individually at the quality of management, their ability to execute, and governance issues. Lumping them together you see varied performance across the group as well, which is not the right way to think about it. We assess each business model, management team and their underlying ability to continue to grow. Certain business models have been discounted more heavily by the market, which we believe is correct. And then there are areas of opportunity where we think the discount level is out of whack. Overall, each of these models are different with different risks and different management teams that have shown varying abilities to maneuver through challenges over the course of time.

Q: I think that makes the point that this is a unique time in economic history and these mega cap tech firms have had such a flywheel effect, where the business models have a commonality, but they're very differentiated business models. And that is where stock selection comes into play.

Warden: That's an important point as these business models are creating a compounding advantage within technology. I think that's something that has caught the regulators attention, too. It's not that these companies are building massive businesses based on merger and acquisitions — they're building market power and compounding what they have at their fingertips. Whether it's data and analyzing available data, or using artificial intelligence or machine learning, the companies are enhancing their businesses and creating higher returns for shareholders. This is important as we analyze and break down the fundamentals of these businesses. They have built a moat and an ability to compound that advantage into the future.

Q: That's a key point that we should underscore — just because these are big businesses, nothing changes in terms of the ability as active investors to stock pick on the fundamentals. We look at the fundamentals, the integrity of management, resilience of business model and valuations, which all provide the basis for our conviction. And in conducting this fundamental

analysis, there have been some phenomenal buying opportunities this year. Year to date, some of these large-cap tech stocks are up 30%, while others are up 50% to 60%, or more. This stresses the importance of being able to pick your spots as a fundamental manager.

A big part of the fundamental analysis is understanding the regulatory factor, such as overt regulation and Federal Trade Commission antitrust concerns, or whether there's more social license operate. For example, is the company in the good graces of the public and viewed as a responsible actor, or are you viewed with suspicion, such as TikTok. Could you touch on your view as an investor of regulatory antitrust concerns?

Warden: We have spent a lot of time understanding the precedent. We've listened to Congressional hearings to understand the angles that the lawmakers are taking and how it could potentially impact business models. I think regulatory authorities really woke up initially in 2016 with the reports about potential hacking and how it may have impacted elections. As you listen to lawmakers, they want to make sure, first off, that the consumer is not harmed. That is hard to prove given many of the different things that are given almost free to consumers, or the cost of goods that have come down because of the ability to buy things online and have almost real-time delivery.

From an antitrust standpoint, we're trying to take a different angle in assessing the amount of power resting with the companies. When we analyze precedent, we look at the antitrust tests placed on companies in history, especially in the U.S. courts. In evaluating what's going on with the leading technology companies right now, we do think there is regulatory risk. Some of that is reflected in a few of the company's stock prices and some it is not, in our opinion, and likely should not be reflected there because we think that regulatory risk is less so.

We think ultimately, when antitrust tests are put in place and they start to challenge them in courts, some of the companies may have to adjust their business models to address some of the concerns. Fundamentally, we're looking at this issue on a company-by-company basis and the potential impact on the business models. We are

assessing if they can continue to generate high returns, even with some of these antitrust-driven changes, to the extent there's something that could fundamentally impact margin structures, business and cash flow. That's where we're making sure that our holdings reflect our fundamental conviction level and point of view. I think there's still much to happen here. And it's something that we're watching very closely because it's absolutely one of the top risks for these large tech franchises.

Q: Typically, where there's risk, it usually creates opportunities as an investor. We prefer risks that are analyzable and those we can objectively take a view on. It's important to understand whether the risks can be mitigated by certain business model structures, durable cash flows, management or governance, among others. Identifying, analyzing and embracing risk can be a source of real return.

One such risk is antitrust scrutiny. If we have a change of administration, there is no doubt that politics could drive a change. Does that mean our analysis needs to be hijacked by figuring out the political odds? No, but it's an important part of the analysis. Increasing antitrust noise is reflective of powerful business models and market power driving phenomenal profits. In looking at the data empirically over a century plus, if you generally owned those businesses that had a lot of antitrust scrutiny, such as AT&T and Exxon Mobil/Standard Oil, and owned them over time, you probably did well as an investor, despite occasional bumps in the road. This is similar to large-cap tech right now, in that if you own companies with business models that are fortified and powerful it can serve you as an investor, so we believe it's important to take the long view.

Warden: I agree. As you think about these business models and the point you just made, there likely will be negative headlines and discussions about company break-ups or fines. We have done the fundamental work to understand the business models of these companies. As a result, it's during such times that we may be able to adjust position sizing to take advantage of some misplaced concern in the market. This is something we absolutely monitor and consider when we think about scenarios and ownership of these large tech stocks.

Ivy Science and Technology Fund Top 10 equity holdings as a percent of net assets as of 6/30/2020: Microsoft Corp. 10.4%, Apple, Inc. 7.5%, Facebook Inc. 6.1%, Vertex Pharmaceuticals, Inc. 4.8%, Micron Technology Inc. 4.8%, Alibaba Group Holding Ltd. ADR 4.1%, Amazon.com, Inc. 4.1%, Aspen Technology, Inc. 4.0%, ASML Holding 3.6%, Cerner Corporation 3.5%

Index Description: The S&P 500 Index is a float-adjusted market capitalization weighted index that measures the large-capitalization U.S. equity market. It is not possible to invest directly in an index.

Index Description: NASDAQ is an electronic exchange founded in 1971 that lists roughly 5,000 common stocks. The NASDAQ stock market comprises two separate markets, namely the NASDAQ National Market, which trades large, active securities and the NASDAQ Smallcap Market that trades emerging growth companies.

Index Description: The Russell 2000 Index is an index measuring the performance approximately 2,000 small-cap companies in the Russell 3000 Index, which is made up of 3,000 of the biggest U.S. stocks. It is not possible to invest directly in an index.

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Risk factors: The value of the Fund's shares will change, and you could lose money on your investment. Because the Fund invests more than 25% of its total assets in the science and technology industry, the Fund's performance may be more susceptible to a single economic, regulatory or technological occurrence than a fund that does not concentrate its investments in this industry. Securities of companies within specific industries or sectors of the economy may periodically perform differently than the overall market. In addition, the Fund's performance may be more volatile than an investment in a portfolio of broad market securities and may underperform the market as a whole, due to the relatively limited number of issuers of science and technology related securities. Investment risks associated with investing in science and technology securities, in addition to other risks, include: operating in rapidly changing fields, abrupt or erratic market movements, limited product lines, markets or financial resources, management that is dependent on a limited number of people, short product cycles, aggressive pricing of products and services, new market entrants and obsolescence of existing technology. These and other risks are more fully described in the Fund's prospectus.

The impact of COVID-19, and other infectious illness outbreaks that may arise in the future, could adversely affect the economies of many nations or the entire global economy, individual issuers and capital markets in ways that cannot necessarily be foreseen. In addition, the impact of infectious illnesses in emerging market countries may be greater due to generally less established healthcare systems. Public health crises caused by the COVID-19 outbreak may exacerbate other pre-existing political, social and economic risks in certain countries or globally. The duration of the COVID-19 outbreak and its effects cannot be determined with certainty.

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