

2nd Quarter Commentary

July 2019

A Conversation that Must Be Had

What if the Internet Bubble Never Ended?

A) The stock market is up 21% this year¹. It's up 14.7% a year over the past 10 years. It just hit a new all-time high. Rewarding, is it not? May we say that is reassuring?

B) The stock market returned only 5.9% a year over the past 20 years. Is that reassuring?

Which is the better number? Which is the one you should lean on for planning your future?

What if, on December 31st, 1999, prospective investors were told that the annual return of the S&P 500 for the upcoming 19 ½ years would be 5.9%? Hardly anyone would have put their money into stocks. That can be said with confidence because the 20-year U.S. Treasury Bond yielded 6.8%. Obviously, anyone could have purchased the much higher-return Treasury and held it all this time.

One can also say with confidence that if the government had not forced interest rates far below the levels of 1999, the S&P 500 would not even have earned as much as that 5.9%. And that if corporate tax rates hadn't been reduced, the return would likewise have been lower.

During these nearly 20 years since 1999, the Federal Reserve's highly engineered gauge of inflation, the Consumer Price Index, measures the inflation rate at 2.1%. Reassuring? The U.S. money supply (M2), a more transparent measure of currency or purchasing power dilution, rose by a 6.1% rate. What do we make of that? Which is the better number? Because if your stock portfolio wealth increased by 5.9% a year, but your cost of living rose by 6.1%...

Of the S&P 500's 14.7% annual return these last 10 years, more than 10% of it, came from just five companies, from just 1% of the names in the index. These are Microsoft, Apple, Amazon.com, Facebook, and Google. And Facebook has only been public since 2013. That's astounding, for sure. But is it reassuring?



Page 1: *What if the Internet Bubble Never Ended?*

Page 3: *Measuring its Extent*

Page 6: *Measuring the Valuation Risk: Outcome #1*

Page 7: *Outcome #2: The Approaching Growth Limits of the S&P 500 Internet Beneficiary Sector*

Page 10: *The Other Risk: The Historical Certainty of Technological and Competitive Displacement*

Page 13: *Displacement Mechanism #1: Technological and Competitive Displacement*

Page 14: *Displacement Mechanism #2: Index Rebalancing and Shelf Space*

Page 16: *Appendix: Selected Holdings*

Portion of S&P 500 Returns Attributable to Microsoft, Apple, Amazon, Facebook and Google, since Facebook's IPO ("Fab 5")²

	S&P 500 Return	Fab 5 Contrib.	% S&P Return From Fab 5
2014	13.7%	1.7%	12%
2015	1.4%	2.2%	162%
2016	12.0%	1.0%	9%
2017	21.8%	5.2%	24%
2018	(4.4%)	0.5%	n/a
1H '19	18.5%	3.6%	19%

¹ Year to date through July 17, 2019

² Source: Factset

For some clarity as to what degree one should feel reassured – or not – we should go back for a few moments to the beginning of this two-decade history of 5% returns: 1999, the final year preceding the spectacular 3-year collapse of the Internet Bubble.

Stock valuations reached heights that were, until that point in history, unheard of. As a basis for comparison, let's consider 1995 to be a normal year, at least insofar as technology company representation in the stock market. In 1995, of the top 10 companies in the S&P 500, two were tech: Microsoft and Intel, and they accounted for 3.8%, by weight, of the index. Of the top 20 companies, five were tech, amounting to 6.9% of the market. By June 2000, though, 5 of the top 10 companies were tech, and were 14% of the value of the S&P 500. Of the top 20, nine were tech and amounted to 20% of the market. Any single industry rarely reaches those weighting levels, and when they do it can be expected to precede a collapse.

Yet this concentration was accepted as quite reasonable by both investors and the professional analytical establishment – it had to have been, otherwise, to state the obvious, the situation could not have gone that far. AOL is a fine example – America Online, for those of us with short memories or the privilege of youth. AOL was the leading internet service provider. It was growing at a torrid pace – with revenues up by 50% a year – and dominant. Ergo, it was priced at valuations that, in Wall Street speak, 'discounted' the future growth: it had a stock market value well over \$100 billion, and in July 1999, it traded at 29x its *revenues* of that year and 305x its pre-tax income from operations.

We employed a slightly different analytical method³. We simply gave full allowance to the possibility that the growth investors and analysts could well have had a valid perspective, one that we as margin-of-safety investors might not have properly appreciated: that of unblemished competitive success. In fact, we dared to be more courageous than even the most bullish analyst. In respect of the majority outlook, we allowed that AOL would not only dominate the U.S. internet access market but would become the sole internet company for the entire world.

Our proprietary model anticipated that AOL's utter global dominance would take 20 years to manifest. This encompassed the entirety of the world population, including the imprisoned. A profit model must be included, of course, so it was assumed that each of the world's households would pay \$20 per month for unlimited internet access, even in impoverished regions without sufficient income for food, and irrespective of access to electricity. Desiring to be as generous as possible, a 50% operating margin was assumed. Of course, very few companies ever maintain such a high operating margin, since it inevitably attracts intense competition, nor did any internet service providers even have such a margin – AOL's was 10% in 1999, and 20% in 2000. But the object of the exercise was to devise an optimistic profit forecast and to then test for reasonability.

The outcome of this AOL valuation model was a total world pre-tax operating profit opportunity of \$117 billion. For context, Microsoft today, 20 years later, with a \$1 trillion market value and being the largest

³ Source: Horizon Kinetics Research. *The Internet Bubble Test, Part I or The Internet: A Study in Reason and Unreason*, dated 7/21/99

company in the world, has \$35 billion of operating profit and a 32% operating margin. Back to AOL, allowing for taxes, 100% market share, no further share issuance nor stock options dilution, and a Year-20 P/E ratio of 30x earnings (which coincidentally happens to be Microsoft's trailing P/E ratio today), the anticipated annual return would be 17.5% per year. Not bad. Not bad at all, really. Ready for the taking.

Of course, having 100% market share of the entire globe would mean that the company could no longer grow any faster than the world population, which in 1998 had expanded by only 1.3%. In that case – since it is well understood that the market is supposed to be a uniquely effective discounting mechanism that anticipates developing events – the final P/E ratio would probably be more reflective of a no-growth utility than a growth stock. More like 10x earnings, not 30x. That scenario would produce an 11.2% annual return. Still, not bad for global monopoly domination over the course of 20 years.

However, a responsible scenario analysis would also have to account for the possible impact of competition, which would surely be attracted by AOL's 50% profit margin. If competition to acquire some of those customers, no doubt employing price discounts, were to leave AOL with merely a 70% world-dominating market share instead of 100%, and a more normal 10% pre-tax profit margin, the annual return would be 8.4%. Of course, if the terminal P/E ratio, given the competition and absence of growth were not 30x, but 10x, then the annualized return to shareholders would be 2.6%.

As thought provoking as such scenarios might be, they rarely unfold as predicted, and we were way off the mark. AOL announced a merger with Time Warner the very next month, in January 2000. But even within Time Warner, AOL did not drape itself with glory. Competition and technological displacement not only arose but had already been in place. AOL was sold to Verizon five years later for \$4.4 billion. By then, its revenues were perhaps half of the level at the time of the Time Warner merger.

Nor did the acquisition by Time Warner help AOL shareholders. The Time Warner shares received in the merger traded at \$121 in January 2000, \$99 in January 2001, and under \$5 in January 2009. Last year, 18 years later, the shares again attained \$100 when AT&T received legal approval to acquire the company.

Why rehash AOL? Because it was perhaps the most notorious signal of the end of the Internet Bubble. Because the Internet Bubble ended, didn't it? And if it didn't end, you'd want to know about it, right?

Measuring the Internet Bubble

You'd want to know, because those Apple and Amazon returns for the past 10 years – 27.2% per year and 36.6% per year – are inconceivable without the continued growth of the internet. The percentage of the world population that used the internet grew explosively between 1995 and 1999, from 0.4% to 4.1%. In terms of number of people, from 16 million users to 248 million. An historically unique phenomenon.

But as of April 2019, there were 4.437 billion internet users⁴. That’s almost 18x greater than in 1999. The extended rapid growth of Apple’s business did not occur in a vacuum: it was supported and enabled by the expansion of internet usage. Today, 18.1 million text messages are sent *every minute*, and these are done on phones, an awful lot of which are Apple phones. Likewise, Amazon.com – just look at the name – could not exist without the internet.

Internet Use, December 1995 to December 1999

	<u>Number of Internet Users</u> <i>(millions)</i>	<u>% of World Population</u>
December 1995	16	0.4%
December 1996	36	0.9%
December 1997	70	1.7%
December 1998	147	3.6%
December 1999	248	4.1%

Source: internetworldstats.com

Today, the Information Technology sector is again the heaviest weighting in the S&P 500 Index: 21.5%. It is worth pausing on this point for a moment, and not only because it is higher than the figure reached during the Internet Bubble. Rather, because people generally think that an equity index is a way to achieve instant portfolio diversification. However, a property of the way indexes are constructed is that they eventually un-diversify themselves; this happens when a handful of firms become hugely successful and come to dominate such indexes. Unfortunately, you will not properly appreciate that by looking at the S&P 500 industry sector weightings. The way that the holdings are classified makes the index appear much less concentrated than it really is.

Top Internet Beneficiary Stocks in the S&P 500

<u>Ticker</u>	<u>Company</u>	<u>Weight</u>	<u>Official Sector</u>
MSFT	Microsoft Corp.	4.20%	Info Technology
AAPL	Apple Inc.	3.54%	Info Technology
AMZN	Amazon.com, Inc.	3.20%	Consumer Discretionary
GOOG/L	Alphabet Inc.	2.68%	Communication
FB	Facebook, Inc.	<u>1.90%</u>	Communication
		15.52%	

Source: iShares

Additional Internet Beneficiary Stocks in the S&P 500

<u>Ticker</u>	<u>Company</u>	<u>Weight</u>
	Info Technology Sector	21.45%
AMZN	Amazon.com, Inc.	3.20
GOOG/L	Alphabet Inc.	2.68
FB	Facebook, Inc.	1.90
NFLX	Netflix Inc.	0.66
AMT	American Tower	0.37
CCI	Crown Castle	0.22
EQIX	Equinix	0.17
SBAC	SBA Communications	0.10
DLR	Digital Realty Trust	0.10
EBAY	eBay Inc	0.13
TWTR	Twitter Inc	0.10
EXPE	Expedia Group	0.06
ETFC	E*TRADE	<u>0.04</u>
	<i>Sub-total:</i>	31.18%

Source: iShares

That’s because Amazon, for example, is classified as a Consumer Discretionary, even though substantially all of its earnings come from its cloud services division, which is called – please note the name – Amazon *Web Services*. It serves and is supported by the growth of internet usage. Facebook and Google are categorized as Communication Services. While it is certainly true that they are used for communicating, as a practical matter, an increase in Google search activity is likely to result in more commercial activity at Amazon, just as would more advertising activity on Facebook. Since these

⁴ Source: Statista

actions are likely to occur over a mobile phone network, traffic at Verizon will continue to rise. Verizon owns Yahoo, which is nothing if not an internet company.

One begins to see the economic interdependencies among these companies, irrespective of their formal industry sector classifications, just as occurred during the Internet Bubble. For more informative and functionally accurate investment and risk assessment purposes, for understanding their business models, they are better described as Internet Beneficiary companies. They benefit from the expansion of internet-based commercial activity.

The five internet beneficiary companies mentioned account for over 15% of the S&P 500. Along with Netflix, they might be considered the obvious, first-level internet beneficiaries, the core portion of a technology ecosystem. In which case, the total internet beneficiary sector concentration is significantly higher. The S&P 500's Information Technology sector houses, clearly, other such companies, like PayPal, Salesforce.com, and Micron Technology. Micron makes memory and storage chips used in cloud storage and smart phones.

Those are obvious enough. Once alerted to this common factor, though, one sees more and more internet-growth beneficiaries within the index. There are also eBay, Twitter and Expedia. And E*TRADE, the internet brokerage firm.

Many of these internet-based businesses confound the diversification characteristics that investors presume to acquire based on the industry sector or asset class label. For example, there are American Tower and Crown Castle, which between them operate 190,000 cell phone towers and rooftop sites. They are categorized as real estate companies and are, indeed, REITs, but they are also unequivocally internet infrastructure companies. Likewise, Equinix, with a \$45 billion market value, is categorized as real estate in the S&P 500. Equinix hosts data and server co-location centers. Its customers include Amazon Web Services, Google Cloud, IBM Cloud, Microsoft Azure, DirecTV, Netflix, Thomson Reuters, Bloomberg, Chicago Board Options Exchange, PayPal, AT&T, Verizon, and the list of such customers goes on.

In fact, investors who feel that real estate is a diversifying asset class might wish to reevaluate their index choice on a company-by-company basis. Five of the top 12 names in the iShares U.S. Real Estate ETF (IYR) are either cell tower companies or data centers; together they account for over 20% of the ETF's market value. What would happen to this REIT ETF, even if U.S. real estate is doing well, if something unpleasant were to happen to the internet related companies?

Largest Internet Beneficiary Stocks in iShares U.S. Real Estate ETF (IYR)

<u>Ticker</u>	<u>Company</u>	<u>Weight</u>
AMT	American Tower REIT Corp	7.76%
CCI	Crown Castle International REIT Co	4.65
EQIX	Equinix REIT Inc.	3.64
SBAC	SBA Communications REIT Corp	2.19
DLR	Digital Realty Trust REIT Inc.	2.11
	<i>Sub-total:</i>	20.35%

Source: iShares

Continue down this road, and you'll find UPS. It has, arguably, benefitted greatly from online commerce. During the past 10 years, its average daily package volume has increased at an almost 40% greater rate than real GDP. Why ever would that be? In which case, you must include FedEx, which helps deliver all the

Amazon.com packages. Now we're up to a 31.63% Internet Beneficiary weight in the S&P 500, and we haven't finished.

The obvious problem is that the S&P 500 is supposed to be a diversified index of equities. Yet, it is concentrated in a narrow but nonetheless rapidly-expanding segment of the economy. Most analysts who follow these companies believe that their earnings growth will continue. As an example, Microsoft is forecast to increase profits by 26.2% in the next 24 months. During the same period, Apple's profits are forecast to grow by 22.8%, and Amazon's are expected to double. Facebook's profits will grow by 27.7% in the next two years, if the consensus view is to be believed.

Contrary to what you might think, these growth estimates are a very serious problem. Because there are two basic outcomes, neither very good.

Measuring the Risk: Outcome #1 (Interim Result Only)

One may accept the belief of analysts and the majority of investors that the internet beneficiary companies will grow at those rates – although they do not view them as internet companies, because for the time being, that is just our classification methodology. Even so, the great majority of the S&P 500 firms – in all the other industries – will *not* grow at these rates. Therefore, in success mode, the internet beneficiaries will have an ever-greater weight in the S&P 500 than now. The index will become even less diversified.

This is the basic problem with the market capitalization weighted indexation approach. At some point the index will become undiversified, and there is no mechanism to reset it to a more diversified posture. Not that it has to be this way. Contrast this with the practice employed in venture capital (VC). A VC fund will make a number of investments, say 10 to 20, some number sufficiently high so that the individual investment returns will be statistically normally distributed among winners and losers. After inception, though, the VC fund does not accept new investors. It also has a termination date, say a 10-year period during which the investments can mature. The hope is that one or two holdings will become the next Microsoft or Amazon. If this occurs, the most successful investments will come to represent most of the fund, by which time the fund will then be entirely undiversified, and this is in fact the goal.

At the end of this pre-established period, the investments are harvested; they are either sold or the shares are distributed directly to investors, so that they may avoid gains taxes. In the latter case, the individual fund participants are at liberty to make their own divestment and diversification decisions. The salient point is that no one invests in a venture capital fund that is already in success mode, because at that point it is undiversified; they only invest when it is in the process of creating an initially diversified portfolio. The orchestrators of the fund simply start a new fund if it is a desirable time to raise capital.

Theoretically, in the world of indexation, the un-diversification problem could be solved by using vintages. In 2009, it might have been entirely reasonable to invest in a market capitalization weighted index, because it was a diversified portfolio. When at some point the portfolio became undiversified, the 2009 vintage of an S&P 500 ETF would – under a VC model – have been closed to new investors, and a *new organizing*

indexation principle might have been devised that would result in a follow-on diversified index. The year that such a portfolio was created would be the new vintage year. Obviously, this is not the contemporary approach. People who buy the major indexes today, such as the S&P 500, are buying the old-vintage, undiversified distortion of the 2009 index, with its attendant growth and valuation risks.

Outcome #2 – The Approaching Growth Limits of the S&P 500 Internet Beneficiary Sector

The conventional approach might be just fine, so long as internet usage continues its historical growth. Yet, it is quite improbable that this growth can continue for very long. If you recall the earlier table that showed global internet usage in 1999, the figure was 4.1%, up from near zero in 1995. But a critical line was crossed just two years ago. In December 2016, 49.5% of the world’s population used the internet, and sometime in the ensuing months it exceeded 50%. Well over half the world is now on the internet: as of this March, the figure reached 56.8%.

Internet Use, December 1995 to December 1999

	<u>Number of Internet Users</u> <i>(millions)</i>	<u>% of World Population</u>
December 1995	16	0.4%
December 1999	248	4.1%
December 2016	3,969	49.5%
March 2019	4,383	56.8%

Source: internetworldstats.com

Can a growth limit be calculated? Yes, quite easily; no Excel spreadsheet necessary. If growth were to continue at a 12% rate for five years, the global internet usage rate would equal 100%. It should be self-evident that it cannot reach 100% within five years. At some point during the next 60 months, investors will realize that growth will cease or at least slow markedly from the historical rate.

Internet Use, December 2012 to Present

	<u>Number of Internet Users</u> <i>(millions)</i>	<u>% of World Population</u>	<u>Year/Year Change</u>
December 2012	2,497	34.8%	2.1%
December 2013	2,802	39.0%	4.2%
December 2014	3,079	42.4%	3.4%
December 2015	3,366	46.4%	4.0%
December 2016	3,696	49.5%	3.1%
December 2017	4,156	54.4%	4.9%
December 2018	4,313	55.6%	1.2%
March 2019	4,383	56.8%	2.0%*

*Vs. est. March 2018 penetration rate of 54.8%.

Source: internetworldstats.com

In fact, it might already have slowed. If so, this would be an inflection point. Inflection points accompany all sorts of very exciting and consequential historical events. In 2018, global internet usage slowed to just over 1%, and this year, measuring from March to the prior March, the figure is roughly 2%. During the preceding five years, usage had been increasing by 3% to 5% per year. It could accelerate again, but limits are being approached.

Echoing the AOL example from earlier, acquiring the remaining 40% of the world’s market share will be nothing like the first 60%. The developed nations are essentially saturated with respect to cell phone market penetration: mobile phone subscriptions per 100 people in prosperous nations like the U.S., Japan, the U.K., and Europe is actually about 120. Meaning that people in developed nations have more than one

phone apiece, on average. As to internet usage, Europe and North America are at 89%. Asia, on the other hand, is at 52% and Africa is 40%. The most populous emerging market nations are India and China. For internet beneficiary companies that require these poorer populations to sustain their expected rate of growth – whether for buying phones, online games, or social media engagement – there will be challenges either of affordability and infrastructural access, or of political and regulatory access. And pricing will be lower. It cannot *not* be lower.

Measuring the Valuation Risk of Today’s Internet Bubble

The internet is so vast and so visible to the entire global investor base that it is inevitable that a dawning realization of its growth limits will be discounted in stock prices – meaning lower valuations – long before it actually occurs.

Analysts have already begun to model a decline in Apple’s profits, partly due to saturation of the smartphone market and partly due to forecasting a commoditization of the smartphone in a manner similar to that of the laptop computer. In other words, the consensus view is evolving towards the idea that Apple will become a cyclical company within three years.

<u>Year</u>	<u>Per Share</u>
September 2019 FY	\$11.47
September 2020 FY	12.81
September 2021 FY	14.52
September 2022 FY	11.36

Source: www.Nasdaq.com as of July 17, 2019

For Apple’s 2019 fiscal year, the consensus earnings estimate is \$11.47 per share; although it rises for each of the next two years, it is only \$11.36 for fiscal 2022.

It is difficult to imagine that by the summer of 2021—roughly two years from now—Apple shares would trade at a P/E ratio much above 15x the lower year-forward estimate. This would be a price of about \$170, some 10% below the current price. In reality, though, although the 2022 earnings estimate appears conservative, it is actually excessive, because the estimate is still steeped in bubble mentality. Here’s why.

Apple earns an after-tax profit margin of 23.68%. This is extraordinarily high. The average profit margin of the S&P 500 on a look-through basis, *inclusive of internet beneficiary companies*, is 10.3%. Johnson & Johnson, the sixth largest company in the index, with patent protection on much of its product portfolio, has an 18.8% profit margin. ExxonMobil, number 10, has a 7.5% net margin. Bear in mind that these are – aside from the technology giants – among the most profitable companies in the world. For Apple, at a 10% margin and 15x the reduced profit, that would be \$72 per share, a 65% decline.

But wait, there’s more. Analysts’ projections of 2022 earnings of \$11.36 per share implicitly assume that Apple will earn a 50% return on equity. That is, Apple’s book value is \$23.02 per share, so \$11.35 of earnings is a 50% return on equity – well, 49.3%, but why quibble? Which is even more extraordinarily high than a 24% net profit margin. Yet, even this figure understates the reality. That is because the book value figure is complicated, in part, by the company’s \$225 billion of cash and marketable securities. These aren’t productive assets – they don’t produce a meaningful return and aren’t even necessary to the business.

A more direct, undistorted measure of Apple’s profitability would compare its earnings to the operating assets that actually produce its revenues and earnings. These would be its property, plant and equipment, and one might add in its inventories. These amount to \$44 billion, or \$9.50 per share. Which means that Apple would earn, at analysts’ reduced 2022 earnings estimate, a 121% return on invested capital. A 20% return on capital, historically, is not generally sustainable by a large company.

It is certainly not the sort of profitability earned by a company experiencing increased competition in a race to acquire customers among the poorer 40% of the world’s population. Because the competition would be exceedingly happy with a lower price for their goods and services, readily commoditizing the product if the outcome is a 20% return on capital.

If Apple were to earn a 20% return on the higher, stated \$23.02 book value recorded on the balance sheet, then its earnings would be \$4.60 per share. At a P/E ratio of 15x, the share price would be \$69, and that would be 66% lower than its recent \$205 share price.

One could apply the same reasoning to Microsoft. Its balance sheet cash exceeds shareholders’ equity, so if one were to exclude the cash – as if it were paid out as a special dividend – one could not even calculate an ROE, since book value would then be negative. You could, instead, measure this year’s expected earnings against operating assets and inventories, in which case the return on invested capital would be 82%. Even adding in goodwill and intangible assets, the return on capital would be 41%. At a more normal, though still exceptionally high 20% return on invested capital, and a P/E ratio of 20x, the Microsoft shares would trade at \$48, which would be 64% lower than its current share price.

None of these assumptions are unreasonable or implausible. If the typical internet beneficiary comes to earn a Return on equity (ROE) between 15% and 20% on a normalized basis, it is obvious that the share prices of one-third of the S&P 500 would experience an enormous decline that would surely surpass the decline of 2008.

Here is a sampling of what the future could look like, applying this method of estimating future profits and values to the internet-centric growth companies.

What If the These Companies Were to Earn a Mere 20% ROE in 2019?

<u>Ticker</u>	<u>Name</u>	<u>Est. earnings per share</u>	<u>P/E</u>	<u>Estimated Share Price</u>	<u>Share Price Decline</u>
AAPL	Apple Inc.	\$4.46	20x	\$ 89	-55.0%
AMZN	Amazon.com	19.28	20x	386	-79.6%
FB	Facebook, Inc.	6.03	20x	121	-37.3%
GOOG/GOOGL	Alphabet Inc.	52.42	20x	1,048	-51.6%
MSFT	Microsoft Corp.	2.45	20x	49	-63.4%
NFLX	Netflix, Inc.	1.64	20x	32	-91.1%

Source: Horizon Kinetics Research

The S&P 500 performance for the past decade would be inconceivable without these companies. The performance of these companies would be unimaginable without returns on invested capital that are without any historical precedent. Those returns on invested capital would be impossible outside the context of an internet-centric business that

can continually service more customers with only marginal additions to invested capital. After all, what is the marginal cost to Facebook or Google or to the Amazon sales-matching platform of one more member or search, or one million more?

The internet-beneficiary companies are clearly the largest single exposure of the S&P 500. Normalization of profit dynamic and valuation are likely to be unpleasant, especially since the consensus view is that the past is merely prologue to a similar future.

Note that such a scenario does not require any recession, economic disruption or upheaval. Most of these companies will be comparatively free of debt and would be very profitable—just less so. The problem would simply be that their share prices would be reacting to lower than their presumed growth rates and ROEs.

The Precipitating Risk: The Historical Certainty of Technological and Competitive Displacement

In this section, history will largely speak for itself. The history of the development of new technology is also the history of the displacement of old technology. It is difficult to even contemplate the development of new technology without the displacement of the old.

The prevailing view is the opposite: that technology companies are growth companies and that the leaders are the favored winners. This view also holds that periodic volatility is simply that: periodic, that share price declines will be overcome by the natural equilibrium position, which is assumed to be growth. Accordingly, one is supposed to purchase shares of the leadership companies on weakness. The reality: large, leading firms are destroyed by changing conditions or new competitors with astounding frequency.

To see this, we just need to stroll down memory lane.

From the beginning of the last century, there is the Dow Jones Industrial Average, created in 1896 by Charles Dow, who founded The Wall Street Journal and co-founded Dow Jones & Company. The first Dow Jones Industrial Average contained only 12 stocks. Hardly any survive. Most were acquired by other firms. For example, American Cotton Oil eventually became part of Unilever.

First Dow Jones Industrial Stocks

American Cotton Oil	Laclede Gas
American Sugar Refinery	National Lead
American Tobacco	North American Company
Chicago Gas and Light	Tennessee Coal & Iron
Distilling & Cattle Feeding	United States Leather
General Electric	United States Rubber

Source: Corporate Finance Institute

When companies were removed from the index, it was generally after a long period of decline. Chrysler was removed in 1979, to be replaced by IBM. General Electric, which was one of the first Dow members, is the only member from the first listing of 90 S&P Index companies in 1926 that is still in the S&P 500. But it was removed from the Dow Jones last year and is in the process of disassembling itself.

Moving on to the middle of the last century, in 1955, Fortune published its first list of America’s 500 largest companies. Just 27 years later, in 1982, as reported in that year’s Economist, of the original top 100, only 29 were still in the top 100. That was in the span of one working life.

Wall Street is littered with the remains of once dominant companies, ‘blue chips’ that ultimately failed to maintain their economic relevance or even failed as going concerns. Pan American Airways was once the world’s leading airline. There was Polaroid. There was Xerox, with its golden reputation, which invented not only photocopying but also the laser printer, the Ethernet, the first personal computer, computer mouse and graphical user interface. Xerox has about exactly one-half the revenues it had in 1999.

Closer to our era, at the advent of Microsoft in 1983, here were some leading computer makers, which were then household names. Ordinary people knew of these companies: Apollo Computer, Bendix, Burroughs, Canon Computer, Computer Vision, Control Data (which acquired Bendix), Convergent Technologies, Creative Research, Data General, Intergraph, NCR, Packard Bell (acquired by Raytheon), Prime Computer, Sperry-Rand (which merged with Burroughs and ultimately became Unisys, which almost went bankrupt), Stratus, Wang Labs. Some failed utterly; others were acquired. But even after being acquired, most of those still found themselves in decline. What did most of them have in common as a competitor? Microsoft, which was then a statistical irrelevancy within the stock market. Yet, with its Q-DOS operating system, Microsoft ushered in the era of personal computers and cut a swath of destruction across the landscape of established computer giants. By the way, Q-DOS is the acronym for Quick and Dirty Operating System – which is why everyone’s PCs were perpetually crashing – before the name was modified to MS-DOS.

Moving forward to the eve of the Great Correction, December 31, 2007, these were the ten largest companies in the world, measured by stock market value.

PetroChina, #1 on the list, had a \$723 billion market capitalization; today, it is \$174 billion, 76% lower. General Electric, #3, had a market cap of \$375 billion; today, it is a mere \$92 billion, 76% lower.

Market Capitalizations, December 2007 vs. June 2019

		<u>Dec. 31,</u> <u>2007</u>	<u>June 28,</u> <u>2019*</u>	<u>Change</u>
		(\$ in billions)	(\$ in billions)	
PTR	PetroChina Company	\$723.22	\$173.87	(75.96)%
XOM	Exxon Mobil Corp.	511.89	324.23	(36.66)%
GE	General Electric Co.	374.64	91.57	(75.56)%
CHL	China Mobile Limited	354.02	186.51	(47.32)%
1398:HK	Ind’l & Comm’l Bank of China	339.12	297.58	(12.25)%
MSFT	Microsoft Corp.	333.05	1,026.51	208.21%
OGZPY	Gazprom PJSC	333.20	86.65	(73.99)%
RDSA	Royal Dutch Shell PLC	264.33	264.12	(0.08)%
T	AT&T Inc.	252.05	244.56	(2.97)%
386:HK	China Petroleum & Chemical Corp	249.75	88.48	(64.57)%

**Dividends excluded.*

Source: Bloomberg

Most of these companies, despite their great size and vast resources, even with more than a decade of expansion opportunity, declined substantially in market value. Yet, that is not unusual. It is actually very common. The only one that has a higher market cap today is **Microsoft**. Ten or 12 years later, the entire list changed over.

One reason: valuation matters. Also, the largest companies represent the most significant market opportunities for competitors; other companies in a free enterprise system want those customers and, to lure them away, try to provide better products and services, or lower prices. Also, when the largest companies begin to have social policy and political impact, they attract regulatory intervention.

The ten largest companies in the world as of March 31, 2019 are as follows.

Ten, 11, or 12 years from March 31, 2019, how many of these current leaders will still be at the top of the list of the largest companies in the world?

Largest Companies in the World, March 31, 2019

MSFT	Microsoft Corporation
AAPL	Apple Inc.
AMZN	Amazon.com, Inc.
GOOG/GOOGL	Alphabet Inc.
BABA	Alibaba Group Holding Limited
BRK	Berkshire Hathaway Inc.
FB	Facebook, Inc.
TCEHY	Tencent Holdings Limited
JNJ	Johnson & Johnson
V	Visa Inc.

Source: Morningstar

Displacement Mechanism #1: Current Examples of Pending Technological and Competitive Displacement

And now to address two present day forms of displacement, either in process at this very moment or which are entirely plausible and impending, and which threaten the most dominant and highest-valued companies in the S&P 500. These examples are but a drop in the bucket; there's a lot of activity out there.

Alibaba, arguably, competes with Amazon. Alibaba considers itself to be the world's largest retailer and e-commerce firm and, in many areas, competes with Amazon on price. It has a \$450 billion market value, and sales rose 50% last year. Its shareholders' equity is about 2x larger than Amazon's, and it has cash in excess of shareholders equity. So, it is not without considerable resources. Analysts expect Amazon to earn \$27.46 per share this year, which would be an ROE of 27.9%. Alibaba is expected to earn a 19.7% ROE. In other words, as on so many occasions in history and in so many industries, we have a company, in this case Alibaba, that is competing with a very successful incumbent by being willing to earn a much lower return.

Is that not precisely how Amazon successfully competed against, even destroyed, an array of competitors in its own relatively brief history? If Amazon were to earn Alibaba's 19.7% ROE, even trading at a P/E ratio of 40x, the result would be a \$774 share price, 60% below the current level.

Dell made its fortune disrupting incumbent personal computer makers by employing a lower-cost, direct-to-consumer sales model, and by being willing to sustain a low margin. It is in the process of trying to repeat this strategy. This is through its 64% ownership stake in Pivotal Software Inc. (PVTI), a newly public subsidiary that has a \$2.7 billion market capitalization. Its mission is to capture market share in cloud computing by underselling the competition, such as Amazon and Microsoft. It has only \$657 million of annual revenue, so obviously it is much smaller than the Amazon and Microsoft cloud divisions, but it has grown by 134% cumulatively in the past 36 months. Pivotal Software operates at a loss. It is fairly well-capitalized and certainly would have access to more capital if required. Consequently, the transformation of cloud computing into a low margin commodity-type business has already commenced, albeit, at a very low level.

If Dell is willing to challenge Amazon and Microsoft in cloud services and gain market share by relentless price competition, there is every reason to believe that Dell or perhaps some other firm would challenge Apple with an inexpensive smartphone. After all, LM Ericsson and Nokia once dominated the cell phone business and these firms were displaced, just as Dell displaced Hewlett-Packard. The current internet beneficiary incumbents have stratospheric profit margins. What if Dell were to enter the smartphone sector with a production approach that turns such phones into a low-margin proposition? What would be the impact on Apple?

A newer competitor is Slack Technologies, which last month listed on the NYSE with the ticker WORK. It did not offer shares in an IPO, to raise money, since it doesn't seem to need the money; it just listed its shares. It is not small; it has a \$17 billion market value.

Slack is a corporate email service. Supposedly it has more interesting features than Gmail, such as integrated group and project collaboration software, but Google can surely mimic any features on Slack. Nevertheless, Slack is actually selling email as a service; Gmail is free. Why is that?

One way or another, whether because Gmail or its commercial users read your emails or because they allow certain ads to come into or populate your Gmail account, Google generates revenues from your email usage. This is because there is a substantial cost to store those messages, to service the email accounts, transmit the email, and so on. The Slack business model is to charge for email and theoretically, by eliminating ads, make customers’ employees more productive by allowing them to concentrate on corporate email and related functionality, and nothing else.

Quite a number of corporations are switching their email to Slack. If this process were to continue, as seems likely, that would concentrate a lot of people on the Slack platform. What else could such an established network or population provide, in terms of demand for additional services? Could Slack provide a spreadsheet as part of the office package in addition to the email service? Obviously, they could. What would that do to Microsoft?

An even newer competitor is WordPress (WordPress.org), which is not public. Because so much time is spent online, it might seem inevitable that many people would establish their own website and blog. To facilitate that, free and open-source content management systems are now available, of which WordPress is an example. It is free and supports online forums, media galleries, and online stores. In principle, boutique retailers can now compete with Amazon. According to WordPress.org, WordPress is used by more than 60 million websites, including 33.6% of the top 10 million websites as of April 2019. A year ago, the figure was 30.7%.

WordPress Model	
<u>Premium Functionality</u>	<u>Cost Per Month</u>
Blogger	\$3
Personal Site	5
Freelancer	8
Business	25
Online Store	45
<i>Source:wordpress.org</i>	

That statistic is important because of the cost to the retailers. When Amazon and eBay allow you to establish an online store, they take commissions as a percent of your sales. Although it varies by category and by type, those numbers are not far from 40% of the revenue. The WordPress model is completely different. The basic business model is that the software is free—one can use the basic system for nothing.

If one wishes to have premium functionality, the costs are as per the accompanying table. The most expensive services are \$25 per month for a business – a much better deal than Facebook – and \$45 per month for an online store – a much better deal than Amazon or eBay.

Displacement Mechanism #2: Index Rebalancing and the Shelf Space Problem

The second way the largest internet beneficiary companies can be displaced is by index rebalancing. Over the last decade or so, the initial public offering market has been unusually dormant. There have been some IPOs, like Facebook, but not many. In the last few months, there have been quite a few. They also come with very large market capitalizations, a shift from historical practice. It is only reasonable to anticipate that

in the aftermath of the IPO, some of the venture investors will repatriate their capital and sell, as usual, which means the float – the number of non-insider shares – is going to be larger than at the IPO.

The more float there is, the more those companies have to be included in the indexes, because that is part of the index rule-set – the position size is determined by the float-adjusted market value. **Uber** just came public, so it is early. By the way, it is called Uber Technologies, so let us say that several months from now, the company is inducted into a technology index. In that case – and Uber now has approximately a \$75 billion market capitalization, which is quite sizable – another holding has to be reduced to make room for it. There has to be room on the shelf. There is actually a shelf space issue in indexation.

In a very robust IPO market, the incumbent companies necessarily suffer just from the ETF algorithm itself. In ordinary circumstances, the only way the ETF sells shares is if there is a net outflow of client funds. There is one other circumstance in which ETFs sell shares, one we just have not seen in the last decade, and it looks like we are about to see it.

If the new companies manage to displace some of the old ones in terms of index weightings and the new companies issue follow-on offerings (FPOs), or if a huge host of IPOs come to market, that must necessarily affect the valuation of the incumbent companies. That is simply because the indexes that incorporate these new constituents must thereby reduce the incumbent company weightings, and the ETFs thereby become sellers of those incumbent companies in order to maintain the new weightings. That selling will be automatic and valuation- indifferent – no different than the manner in which they have been buying for the past decade. That must happen.

It is conceivable that in the not too distant future, companies like **Square** (SQ), Uber Technologies (UBER), and **Lyft** (LYFT) will be added to the S&P 500. The aggregate market capitalization of these three stocks alone is already \$128 billion.

We, Here, Far from the Maddening Crowd

At least we hope so. Following are thumbnail descriptions of some of our equity portfolio holdings. It is intended that they have very little in common with almost everything just discussed.

Braemar Shipping Services plc is one of the world's leading shipbroking companies. It also provides technical services, such as loss adjusting for the insurance market and offshore engineering services; logistics services, such as customs clearance and freight forwarding; and financial services, such as restructuring consulting, loan servicing, and debt and equity financing. Nevertheless, 70% of underlying profits are derived from shipbroking, which is essentially an information, database and clearinghouse or buyer/seller matching type of service. There are approximately 53,000 merchant ships active around the world, 11,000 of which are container ships. This global fleet makes around 9,000 port calls every week. The vast number of permutations possible in trying to identify an appropriate vessel for any given shipper's requirement-set for type, function and size of ship, quality and provenance, availability in a given time window from one specified port to another, as well as voyage pricing, is simply not possible without such a broker. The company has been growing by acquisitions and has realized a number of extraordinary expenses related to these transactions in recent periods. If one adjusts for these charges, the company has been profitable throughout the depressed shipping cycle.

The company's financial performance can be attributed to the benefits of the shipbroking business model, which is asset-light and highly scalable. Braemar owns no vessels and, therefore, has minimal debt and a relatively low fixed expense structure, thus limiting its downside when its markets are weak. However, once the environment improves and shipping rates increase, its earnings should grow materially, as its voyage broking fees are based on the value of each transaction. That pricing leverage is generally accompanied by increased volume of activity as well. Put simply, shipbroking provides exposure to the upside in a better shipping market without many of the risks associated with a traditional vessel operator.

Historical experience shows that margins in the Shipbroking segment could double once conditions improve. Overall revenues could increase, as well, implying net income potential more than 100% greater than what it is earning at present. The Technical and Logistics businesses will also see business activity expand as the market strengthens, while the Financial segment has organic growth prospects in addition to cyclical earnings potential. In total, Braemar is capable of earning an estimated £26 million a year under better conditions, which is a meaningful improvement relative to the consensus earnings forecast of £3.8 million for the 2019 fiscal year (ending February 2019) and £7.4 million for 2020. If one also factors in the modest degree of multiple expansion Braemar typically enjoys when earnings are growing, total returns could easily exceed 300%.

This would be an excellent potential return relative to the company's risk. Net debt is modest at £22.7 million, but £13.4 million of this is convertible into equity and would not be materially dilutive to shareholders relative to the magnitude of the upside. The balance sheet risk, therefore, is minimal. The ability to remain profitable in a depressed shipping market also goes a long way towards assuring that the company will survive until rates improve. It should also be mentioned that investors are being paid to wait until this upside materializes, as the current dividend yield is a healthy 9.1%. This is an attractive return based solely on the dividend yield; yet, shareholders are also getting an option on the significant upside potential, with limited risk.

Founded in 1852, Clarksons is a U.K.-based shipping broker. It arranges contracts between buyers and sellers (or lessees and lessors) of a variety of ships and equipment, including dry cargo, containers, tankers, LNG, and offshore drilling rigs and equipment. As a broker, it simply collects a fee based on the value of the transaction. This is the company's largest operating segment, representing nearly 75% of total revenues.

Through various acquisitions, the company also provides financial services to the shipping industry, such as investment banking and project finance structuring. Similarly, it has established a research segment (although small, about 5% of revenues), in which it provides subscription-based data to industry participants. Given its role as a broker, it is in a prime position to gather relevant industry information. Data is provided on 140,000 vessels, 25,000 machinery models, 40,000 companies, and 600 shipyards.

The shipping industry and, consequently, shipping rates, have been in a decade-long recession. This ultimately will not be corrected until the ship oversupply is eventually ameliorated – towards this end, a fair number of ship operator bankruptcies and other negative events have occurred since 2008; consequently, the elimination of oversupply is well under way.

Nevertheless, shipping rates are still depressed. Since Clarksons receives a fee on ship leasing transactions, the notional value of these contracts remains low, which continues to put pressure on the company's earnings. Last year, it recorded \$440 million in revenue, and \$46 million of net profit. This is important inasmuch as it remains solidly profitable, despite poor industry conditions. In any case, since these are depressed earnings, the 20x P/E ratio is virtually meaningless at this point.

Yet, one must consider the amount of dormant earnings power that ultimately could be released in a normal operating environment. If shipping rates were to recover, the value of the contracts brokered would rise considerably – and the Clarksons commission revenue would increase commensurately. But this would not require any additional expense, such that operating earnings would expand at a disproportionately higher rate than revenues. For context, the company publishes the Clarksea Index, which is an aggregation of various daily shipping rates (i.e., charter rates). In 2007, this index reached a level of \$48,494/day. More recently, in March 2009, the index value was only \$11,130/day. In theory, if this prior high were ever reached again, the company's revenues could expand by over 300% – and earnings could expand by an even greater magnitude. This business model has enormous operating leverage, due to the largely fixed cost structure. The shares effectively represent a deep out-of-the-money call option on a recovery in shipping rates.

This company has uniquely attractive investment attributes relative to the actual operating risks associated with the industry. Ship operators require large amounts of debt or equity capital to finance new ship construction, and if revenues were to decline to a point causing sustained operating losses, not only would there be solvency risk, but access to new capital (either to restore the balance sheet or to finance additional ship building) could be extremely constrained. Clarksons has virtually no debt and exists as a croupier to the industry – merely collecting fees on the transaction volume and capital-at-risk of others. This eliminates their operational risk and maximizes their capture of recovery-based earnings.

It should also be noted that Clarksons, which has a \$941 million market capitalization, is still a small-cap company. It does not, therefore, have widespread institutional research coverage, nor is it a significant factor in the world of indexation and ETFs. If there is a meaningful recovery in shipping, this lack of corporate visibility could change very rapidly and could have an extremely positive impact on the underlying valuation (vis-à-vis the share buying pressure associated with inclusion into various ETFs).

Cheniere Energy was formerly an oil and gas exploration company. Around 1999, it abandoned its oil and gas drilling strategy in favor of building a liquefied natural gas terminal on the Gulf Coast – management at the time believed that the abundance of the natural gas reserves held within the United States could position it as a large net exporter of liquefied natural gas.

Over the course of the next two decades, Cheniere managed to navigate the quite cumbersome regulatory and permitting process. Eventually, permission was granted, and construction of the Sabine Pass facility commenced. Yet, given the immense capital requirements of the export facilities, Cheniere financed construction mostly through debt. Since a number of years were required to complete the construction, during which no operational revenues were produced, the incremental debt continued to accumulate, leaving it as a highly leveraged company.

However, the debt obligations (in particular, the interest payments on the debt) can be predictably managed through the structure of the revenue stream. The company's shipments are based on contracts that generally extend 20 years. They allow for a fixed annual fee to be paid, in addition to a variable rate that is based on the prevailing Henry Hub natural gas spot price. The fixed payments are essentially a non-refundable deposit paid to Cheniere regardless of the volume shipped. The variable payments, of course, depend on the quantity of LNG shipped to each customer, and are structured such that Cheniere collects a price equal to 115% of the Henry Hub price – meaning, it should never be forced to deliver LNG at below market prices. In essence, there is a highly predictable, programmable element to the company's forward earnings and cash flow, to a degree rarely encountered.

Currently, Cheniere operates six natural gas liquefaction terminals, or trains (five at its Sabine Pass, Louisiana facility and one at the newly constructed Corpus Christi, Texas facility). Production capacity for 80%-95% of its total shipment volume at most locations already has been secured under contracts lasting at least 20 years. In 2018, the company generated \$8 billion in revenues and \$1.2 billion of net income.

Given the abundance of natural gas being produced in the United States right now, Cheniere has embarked upon an expansion strategy, which will consist of three additional trains at a new export facility in Corpus Christi, Texas (strategically located near the Permian Basin). Commercialization of two of these trains is expected to occur in 2019, with the total project reaching completion in 2021. Based on current plans, the company will have nine full-size trains operating overall, as well as several smaller trains at the Texas location.

Cheniere is in the middle of a long-term growth expansion that will add significant capacity in coming years (and quite a bit in 2019 alone). It currently has \$32 billion in total assets (and \$28 billion of debt). One way to roughly estimate the earnings power of this balance sheet is to compare the returns of the oil/gas pipeline companies – a somewhat similar set of regulated energy companies with long-term revenue contracts. Based on a sample of the largest pipeline operators, the after-tax return on assets is in the range of 3%-10%. If Cheniere can only earn a 6% ROA, it would generate over \$7/share of net earnings. At a low multiple of 12x, the share price would be \$89, which is a significant premium over the current price.

Additionally, only half of the company's assets are actually operational, while the balance still represents construction-phase projects. Based on income recorded in 2018 relative to the operational assets, the longer-term ROA (when all construction is finished and the assets are mobilized) might be closer to 8%. This would suggest a share price of roughly \$120, which is twice the current price.

Civeo Corp. provides workforce accommodations and facility management services to the oil and oil sands industries in Canada and the US, and to the metallurgical coal industry in Australia. The company was spun off from Oil States International in early 2014 and enjoyed a period of rapid growth in the years leading up to this separation, but saw its revenues fall significantly when oil and metallurgical (met) coal prices began their precipitous declines. It has struggled for a number of years, as many of its clients shuttered mining operations and cut capital expenditures, but it has remained cash flow positive throughout the worst part of the cycle and positioned itself so as to benefit once business improves. This appears to be happening, based on a rebound in metallurgical coal prices and a number of recently awarded contracts related to LNG infrastructure projects in Canada, which should lead to significant earnings improvement starting in 2019.

The investment case is based on Civeo's current free cash flow, which represents an adequate rate of return for investors even if its business were to stay depressed. The company generated more than \$40 million in free cash flow during both 2016 and 2017, and \$37 million during a challenging year in 2018, which is equal to a free cash flow yield of approximately 10%. Much of this cash is currently being used to pay down debt, which could increase the value of the equity to shareholders by nearly 10% per year for the next 8 to 9 years, until the debt is retired.

This scenario will likely prove to be conservative, however, considering the company's recent LNG contracts, which point to meaningful earnings growth over the next few years. Civeo expects EBITDA of \$100 million to \$110 million by 2019, while the contract terms point to an estimated \$115 million to \$125 million in EBITDA by 2020. Based on these forecasts, if one were to assume constant EBITDA multiples and a modest amount of debt repayment, Civeo's share price could appreciate by as much as 65% over the next two years.

While this would certainly be a positive outcome for shareholders, it still fails to reflect the company's full earnings potential, since it does not include any possible recovery in the oil or met coal markets. It is reasonable to believe that Civeo could generate EBITDA of \$225 million to \$250 million a year in a better environment, assuming occupancy rates and day rates well within what it has experienced historically. However, even this understates what the company has already demonstrated to be possible, having earned nearly \$500 million in EBITDA during its best year. Again, because the current earnings yield represents an adequate financial return, shareholders are getting a free call option on this earnings potential.

The CME, which has a \$62 billion market capitalization, is the largest exchange in the U.S. As primarily a derivatives exchange, the company has a well-diversified offering of futures contracts, including interest rate, agriculture, equity indexes, foreign exchange, metal, and energy (the energy and agriculture segments were expanded greatly through the acquisitions of the Chicago Board of Trade and the New York Mercantile Exchange). The CME also owns a significant equity interest in OneChicago (a single stock futures exchange), 25% of the Bursa Malaysia Derivatives Berhad, 50% of the Dubai Mercantile Exchange, and 27% of S&P/Dow Jones Indices. In late 2018, it also purchased NEX, which operates the BrokerTec trading platform for U.S. Treasuries and other foreign exchange contracts.

Although not widely known by most investors, the CME is a great beneficiary of higher interest rates – to be more specific, volatility in interest rates. In 2018, interest rate futures contracts amounted to 52% of the company's total daily trading volume, so these contracts have the most impact on its earnings. Institutions frequently hedge interest rate exposure via the futures market, such that an expectation that an increase in rates likely causes more futures contract trading activity (and vice versa in a declining rate environment). This has been evident over the last five years. Amid the Federal Reserve's near zero interest rate policy in 2014, daily interest rate volume at the CME was 7 million contracts. As this policy reversed a few years later, contract volume reached 9.951 million, a 42% increase over five years. Given that interest rates are still at very low levels, the CME represents a call option on any rate expansion that may occur in the future.

There is also optionality in the company's bitcoin futures contract. Although trading in this contract recently reached a record in April (slightly over 20,000 daily contracts), it is still not meaningful to the company's overall volume of over 4 billion contracts annually. However, the adoption and use of bitcoin and other cryptocurrencies is still inconsequential within the global payment and currency systems. If this ever were to change, and bitcoin were to become even a moderately successful form of payment/currency, in our opinion, merchants and other users would use bitcoin futures to hedge exposure, as is similarly done with currency futures and swaps. Over time, this could be a considerable product for the CME. Importantly, the CME contract would likely be the most heavily traded (to the extent the CBOE and other exchanges introduce competing products), having now been established as the most liquid bitcoin future.

In addition to these two earnings considerations, as well as ordinary growth in the existing futures franchise, any one of the company's investments in exchanges (or index businesses) could become more meaningful and productive assets on the balance sheet. The CME also licenses the use of its GLOBEX trading platform to certain other exchanges, providing yet another income stream.

What CME shares in common with other exchanges is its high-fixed-cost / negligible-variable-cost operating structure. In practical terms, not only can any one of its products trade vastly higher volumes in the right environment, but these increased sales could translate very nearly 100% to an increase in pre-tax operating income. As well, some of its products with the greatest such potential are countercyclical, such as might occur during periods of interest rate shock, rising commodity prices or credit market deterioration.

Given the dominance of its position in the derivatives trading market, and near unrivaled profitability (61% operating margin), the CME is not a cheap company. It currently trades at 26x the 2019 consensus earnings estimate. While there is intriguing earnings optionality that, presumably, is reflected in this multiple, the potential risk associated with this type of valuation is mitigated through the smaller sizing of the position in our portfolios.

Franco-Nevada is a Canadian gold-focused royalty and streaming company, although it acquires royalties in other commodities as well, including silver, copper, oil and gas. It does not operate mines itself, but rather, collects royalties from mining companies or purchases future gold production at pre-arranged prices, in exchange for providing investment capital. Those prices represent a discounted present value of future years' production, established by using an interest rate negotiated between the miner and Franco-Nevada. It can be startling to read that a typical contract might give Franco-Nevada the right to purchase gold at perhaps as low as one-third of current prices. It is clear both from per-ounce prices for new gold and silver contracts announced, as well as from the rate of book value expansion, that these are double-digit rates of interest, perhaps in the 12% to 15% range. The deep discount relative to current prices is simply a reflection of the power of compounding over, say, a 20-year period or longer and brought forward to the present. Franco-Nevada earns that discount over time and is a consistent generator of return of equity (ROE).

This business model is unusually attractive. Royalty companies are among the highest-margin businesses of scale that exist, in that there is very little operating expense. General & Administrative expenses are only a few percent of revenue, and the contracts produce copious amounts of free cash flow, which are reinvested in additional royalty contracts or paid out as dividends – the company has increased its dividend every year since its initial public offering in 2007. The business model also requires little debt, thereby minimizing the financial risk. Since its inception, the shares have produced a total compound return of approximately 16% per annum even as gold prices have languished and gold mining companies have declined. Moreover, the company outperformed the S&P 500 by roughly a 4:1 margin during that time. This occurred despite a weak pricing environment for gold and silver.

The company is the beneficiary when its investees increase production, as well as when gold prices rise. However, it is not directly impacted by cost inflation, as the expenses are borne by the operators, not directly by Franco-Nevada. Similarly, the company is not encumbered with risks that are normally faced by mining companies, such as increased personnel costs, exploration and development expense, and mine reclamation or remediation. The latter is important, as these costs are difficult to predict and can be quite costly in severe cases.

In the past 10 years, the annual volume of gold-equivalent ounces the company has sold under royalty agreements has increased from 110.3 million ounces to 497.7 million ounces, or almost fivefold. Yet, of the 376 royalty properties that comprise its asset portfolio, only 107 are producing. The remaining properties may be thought of as a dormant asset. As such, there is an enormous amount of upside potential when these properties start production.

The primary attraction in Franco-Nevada pertains to the inherent optionality that its business offers, leveraged to a combination of higher gold prices and increased mining activity care of the dormant assets embedded in its royalty portfolio. The first pertains to appreciation in the price of precious metals, which typically are in greater demand during periods of U.S. dollar decline or political crisis. This provides the

sort of countercyclicality or diversification element in portfolios that prompt many investors to favor gold or gold miners, yet without the opportunity cost – since gold does not produce income or earnings – or the business risk of a capital- intensive complex business. The second source of optionality is rooted in the probability that at least a portion of the properties that are not currently active will start producing gold/silver/oil/etc. at some point in the future.

Interestingly, the Franco-Nevada shares trade at a generally normal earnings multiple. However, the earnings are being produced by the active properties, which is to say that no value is being paid for the larger portion of the contract portfolio, which does not yet produce earnings. It is difficult to know whether this oversight – if it is an oversight – is due to the reticence of investors to pay for value to be received in an indeterminate time frame, or whether it is a function of the almost complete absence of royalty companies in ETFs. Considering that the number of dormant properties exceed currently active locations by a 2.5-to-1 ratio, the assumption that this optionality manifests into higher production appears reasonable.

The Grayscale Bitcoin Trust (GBTC) presently holds approximately 21,440 Bitcoin. It acts similar to a closed-end fund in that it can trade at a premium or discount to its underlying net asset value. Usually, GBTC trades at a premium of around 20-50%, but this has been as high as 100%. While GBTC holds 1.21% of all the Bitcoin currently in circulation, it is probably a considerably greater percentage of the float when the so-called spoilage is excluded, which are the Bitcoins that are forever lost on crashed hard drives or when account passwords are lost. It has been estimated that as many as two million Bitcoins are forever lost.

GBTC is highly correlated to the price of Bitcoin, and the Bitcoin price is, of course, highly volatile. Bitcoin's ultimate supply is fixed at 21.0 million units, and this level is not scheduled to be reached until the year 2140. Since there are now 17.7 million outstanding, that implies a very low inflation rate over the next 121 years, specifically 0.14%, and that will be zero thereafter. In the interim, the inflation rate is 3.6% per year, or slightly higher than the official consumer price index in the U.S., but only until May 2020. At that time, the reward received by Bitcoin miners will decline by half, which means the inflation rate will decline to 1.8% after that date, and to 0.9% in 2024 after the next halving, etc. Miners are currently rewarded with 12.5 Bitcoin ("BTC") for every block mined. When that falls to 6.25 BTC per block, they will need prices to rise to compensate for the lower reward. Bitcoin experiences these halving events every four years, and based on what happened after previous halvings, significant price gains could occur. A similar coin, Litecoin, is expected to have its next halving event in August 2019 and, perhaps in anticipation, its price has more than doubled since the start of the year.

As the price of Bitcoin spiked in 2017, the price of the computers used to mine it (known as application-specific integrated circuits, or ASICs) increased dramatically due to strong demand. Those machines, which then cost around \$3,000, could recently have been purchased for approximately \$300. As the price of Bitcoin declined, the expensively purchased ASICs could not mine Bitcoin at a profit (relative to that capital cost). Consequently, some of these machines were turned off, written down, or sold at a loss, with many mining companies going bankrupt. The demand for ASICs declined just as production was ramped up by manufacturers such as Bitmain (the primary supplier of Bitcoin ASICs), and these two factors occurred at the same time as ASICs previously used by failing miners flooded the market. The result was a spectacular decline in ASICs pricing. A side effect and follow-on benefit of lower equipment prices was that the cheaper mining equipment could be profitable at the lower Bitcoin prices. However, at \$300 per ASIC, the price is unlikely to continue to decline meaningfully, and miners might therefore require higher Bitcoin prices to remain profitable. This positive pressure for a higher Bitcoin price might well coincide with the pending halving event.

An important development is the Lightning Network, which is a "Layer 2" payment protocol that operates on top of a blockchain-based cryptocurrency (such as Bitcoin). It is designed to enable fast transactions between participating nodes and has been touted as a solution to the Bitcoin scalability problem. When fully operational – it has been in extensive beta testing – the Lightning Network is expected to improve Bitcoin's miniscule 7 transactions per second capacity to a level similar to those of VISA and MasterCard, at approximately 50,000 transactions per second, with almost negligible transaction fees. Consequently, this technology, when it emerges from beta testing, could accelerate Bitcoin's adoption and improve its value as a transactional currency. If so, GBTC should be a primary beneficiary.

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