

MARKET SIGHT *LINES*



The Tech Revolution Continues

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A few years ago, my team and I identified the *Fourth Industrial Revolution* as one of our long-term investment themes. A concept defined by the World Economic Forum, the *Fourth Industrial Revolution* involves the integration of technology into our worlds through digitization, thereby blurring the boundaries between physical and virtual, and changing the way we live, work, and do business. Interestingly, the coronavirus pandemic further accelerated many technological innovations, driving “Big Tech” stocks higher, with the NYSE FANG+ Index (which tracks 10 global tech giants) returning 103% in 2020. In turn, investors have been asking the question: Should we invest in technology stocks now, given their recent performance? Our answer: If you are a long-term investor, yes. Building and maintaining exposure to this part of the market is important, and we believe innovation will drive positive long-term returns.

In this latest Sight|Lines, we review some examples of how the pandemic has accelerated innovation, and identify some areas of potential, dramatic innovation over the next 10 years. Looking out 10 years and beyond will give us a sense for just how transformative this innovation may be.

Trends Accelerated by the Pandemic

A number of trends have been accelerated by the pandemic. Take for example, the way we get our entertainment. Streaming has taken further hold in households, the film industry has pivoted to launch new releases online, and concerts and other events were streamed live. Big advances in video production are being driven by improved augmented and virtual reality. This is all made available through digital connectivity, which is driving the *Fourth Industrial Revolution*. Peak internet traffic was up about 50% from 2019 to 2020. Screen time on mobile devices was up twelvefold from 2008 to 2018. Through 2020, screen time is up much further. For example, the percentage of children on their phones more than four hours per day more than doubled, from 21% to 44%.

We've seen changes in consumer behavior as a result of the pandemic. For in-person purchases, there's been an increase in the use of contactless payments like digital wallets and cards with tap payment. Retailers are working to make the experience as “frictionless” as possible, moving toward cashierless checkout, for example. And pandemic shutdowns were a boost to e-commerce. Before the pandemic, e-commerce penetration was projected to be 22% in 2030. With increased use and familiarity resulting from the pandemic, the forecast for e-commerce penetration in 2030 is now 34%. This comes as categories that have previously had a slower adoption for online shopping, such as groceries and household supplies, have seen significant increases.

Of course, the nature of work and education has changed. We've learned to work remotely, and this has spurred adoption of video conferencing, virtual desktops, and cloud-based applications. Companies have adapted, and many, but not all, expect to make remote working a permanent part of their approach. The same trend is also seen

in higher education, where colleges and universities are increasingly offering online and remote methods as an alternative to in-person classes.

The World in 10 Years

While it is difficult to see the future, let's consider some possible advances resulting from the *Fourth Industrial Revolution*. Consider healthcare. Remote monitoring is one the rise and expected to grow much further. Applications include patients just out of the hospital, as well as those with diabetes, heart disease, and other chronic conditions. And we should make great strides in our battle with cancer, given technology-driven advances in testing and cell therapy.

We discussed above the advances in digital payments in 2020. In 10 years, it is quite likely that digital payments will be the standard. We should expect smarter appliances in our lives. Perhaps our refrigerator will monitor our food supply, order a delivery, and provide the digital payment.

A concept important in the *Fourth Industrial Revolution* is the Internet of Things, including wearables. In 10 years, we may wear ear buds powerful enough to translate a foreign language in real time, or smart glasses that translate signage in a foreign country. Such wearables will also allow us to experience augmented reality, blending our physical and virtual worlds.

And while the pandemic has caused an accelerated shift in entertainment, we should expect the trend to continue even further. Consider that a Broadway show costs about \$110 per person, on average, and provides three hours of entertainment. In comparison, a mobile video game costs \$1 per user and provides unlimited entertainment. Digital entertainment could be even more dominant in 10 years.

Our future will most certainly include self-driving cars, and this could become the most common form of automobile transportation. And most of those may be electric vehicles. The International Energy Agency (IEA) projects that the worldwide electric vehicle fleet will grow at an annualized rate of 28% over the next 10 years.

Our future world may be powered by renewable energy. While a little further out, some forecast that by 2050 about three-quarters of the world's power generation will come from renewable sources – solar, wind, and hydro. We will continue to see technological innovation in each area.

Conclusion

Transformative innovation, driven by technology, is changing our lives, including how we work and how we play. We'll continue to see significant improvements over the next 10 years and beyond, in areas like healthcare, entertainment, and renewable energy. And the *Fourth Industrial Revolution* will continue to shape and influence our long-term investment decisions going forward.

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