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AlphaCurrents

Virtual Reality, Augmented Reality and the Metaverse—Opportunities in Digital Worlds

In this month's *AlphaCurrents* we provide background on virtual reality, augmented reality and the concept of the "metaverse." We also highlight several publicly traded companies focused on driving advancement and adoption in the space.

- Amid the COVID-19 pandemic, digital communication proved to be an indispensable technology as the world moved "remote." Digital adoption across a number of industries saw sharp increases and the pandemic experience appears likely to accelerate investment in digital businesses.
- Virtual Reality (VR) and Augmented Reality (AR) technology will likely benefit from acceleration in investment in the years ahead, in our view. Importantly, VR/AR technology has already been improving, and this could drive more blending of digital and physical worlds.
- While it is still early days for VR/AR, many of the large technology companies are involved and investing in the space. In this report we identify several public companies that are exposed to VR/AR. We also highlight opportunities in ancillary technology industries that are likely to benefit as VR/AR adoption grows.

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Digital Interactions and COVID-19

As the pandemic raged last spring and lockdowns were instituted across much of the US, it was only natural to wonder how the economy and society would function with so many of us stuck at home. While it is impossible to overstate the effect the pandemic had, and we do not seek to minimize its devastating toll, after the initial shock many of us found ourselves sharing a similar silver-lining realization: With recent advancements in technology, we could actually get by okay—at least for a little while.

It was remarkable to see how quickly we adopted digital alternatives that still allowed us to feel connected even as our normal routines were upended. As offices closed, millions of people flocked to Zoom, recording over 3.3 trillion hours of virtual meetings in 2020—33 times more than the year before. With gyms shut, virtual classes took off, as companies like Peloton saw their membership and engagement surge. And while schools could go remote, with so many kids unable to go out and see their friends, perhaps we discovered a newfound appreciation for video games, with virtual worlds becoming safe places for social interaction during a pandemic. And it wasn't just about playing games—in the early days of the pandemic nearly 30 million joined together in the *Fortnite* ecosystem one weekend in April to watch Travis Scott perform a virtual concert!

Seeing the rapid adoption and application of technology last year begs the question—what would we have done if the pandemic hit ten years earlier, before a smartphone was in nearly every hand, or two decades ago, before high-speed internet became ubiquitous? While, clearly, technology advancements allowed us to transition to remote life, there's also much that could be improved on. Flipping the question around—in 10 years, what technology will be widely available that, as we look back on pandemic life, we may wish we had had?

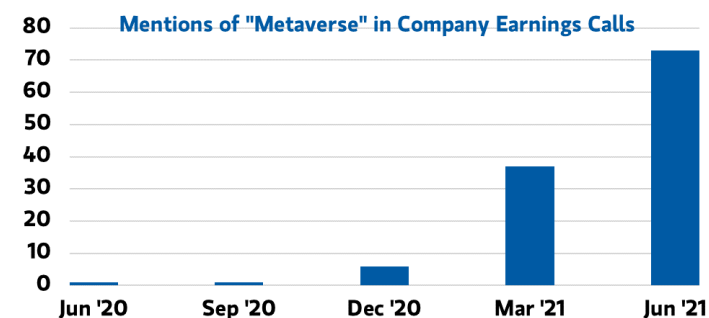
Our guess is it will be in the realm of virtual or augmented reality. While many may think of VR/AR as a niche technology, in the years ahead technology improvement is likely to drive a more seamless experience that both increases the prevalence and expands the use cases for virtual reality. And the pandemic experience is likely drawing more attention to this area. Just last month Facebook announced its "Horizon Workrooms" effort to join users in virtual workplaces meant to simulate the office experience, and several other big technology companies are reported to be working on similar projects. In this month's *AlphaCurrents* we provide background on virtual reality, augmented reality and the concept of the metaverse. We also highlight several publicly traded companies focused on driving advancement and adoption in the space.

VR, AR and the Metaverse

What are virtual reality and augmented reality? And what's the difference between the two? Merriam-Webster defines virtual reality as an artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one's actions partially determine what happens in that environment. Augmented reality is defined as an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device such as a camera smartphone. Perhaps a simple way to think about the difference between VR and AR is that VR is a fully immersive virtual experience, while AR simply adds digital enhancements to a physical environment.

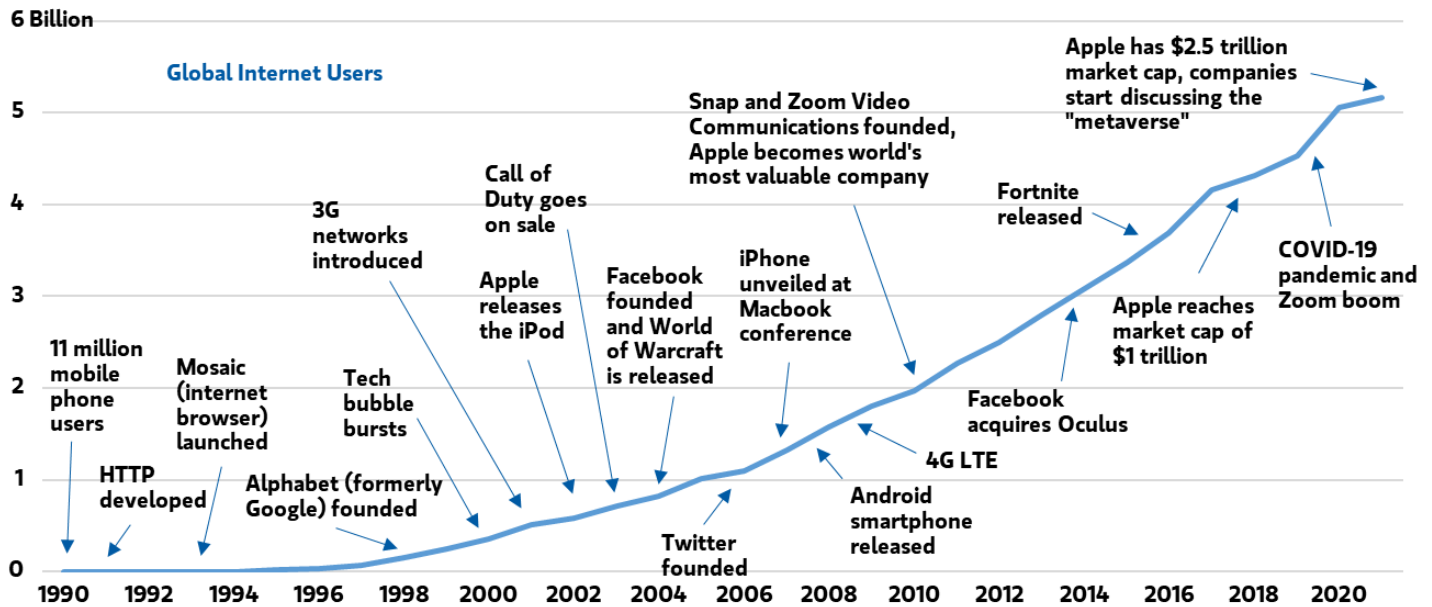
Many of us think of VR/AR as a singular experience—one in which a person wears a headset and enters his or her own virtual world, or wears AR glasses and benefits from a digital overlay in order to see information that enhances and augments the physical environment. While this may largely have been the state of VR/AR in the past, the future of VR/AR technology is likely to be much more about a connected digital experience, i.e., a shared virtual world where users interact with each other. Still in its early days, this concept of a shared experience has been referred to as the "metaverse"—a loosely defined idea related to one or more virtual environments and the seamless movement between digital and physical worlds. While the metaverse concept has grown in popularity—according to analysis from Bloomberg, the term metaverse was mentioned 73 times on second quarter earnings calls (see Exhibit 1)—defining it precisely remains difficult.

Exhibit 1: Companies Are Talking About the Metaverse



Source: Bloomberg, FactSet, Morgan Stanley Wealth Management Global Investment Office as of Sept. 21, 2021

Exhibit 2: The Internet Has Evolved Over the Past 30 Years



Source: Internet World Stats, Morgan Stanley Wealth Management Global Investment Office as of Sept. 21, 2021

One way to think about the metaverse is internet 3.0—building on the transformational nature of desktop (or fixed-connection) internet in the 1990s and 2000s and the mobile internet revolution of the 2000s and 2010s. The development of internet 1.0 allowed us to access the internet, communicating, accessing and transmitting information from a hardwire-connected device. Mobile internet (2.0) has ended up being just as transformative as the conception of the internet itself, as it allows us to connect through devices from anywhere with a wireless connection and enables so many of the applications we use today. So what could internet 3.0 be?

The next extension from mobile internet is likely to be defined in part by VR/AR—as users go from consciously accessing the internet through a device toward a world where they are always online, with devices in the background capturing and transmitting information. As technology continues to evolve, this will likely drive the blending of physical and virtual worlds, whereby what we do in the physical world is captured and affects what transpires in a virtual one—the metaverse (see Exhibit 2).

Mark Zuckerberg and Facebook have been vocal pioneers of the metaverse concept. On Facebook's July earnings call, Zuckerberg describes the metaverse as a virtual environment where a person can be present with other people in digital spaces, and went on to say that you can think about this as an embodied internet that you're inside of rather than just looking at. Facebook believes this is going to be the successor to the mobile internet, and that access to the metaverse will be

available from many different devices.

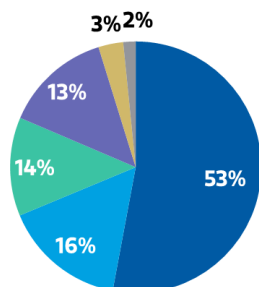
Noting that, "Within the metaverse, you can build a hangout, play games with friends, work, create and more. You're basically going to be able to do everything that you can do on the internet today, as well as some things that don't make sense currently, like dancing. The defining quality of the metaverse is presence, which is the feeling that you're really there with another person or in another place." Zuckerberg believes that Facebook's future will not be as a social media company, but rather a metaverse company.

Current and Future Use Cases of VR/AR

While we may still be several years away from beginning to understand the potential of the metaverse, there are plenty of applications for VR/AR today that are likely to grow in prominence in the near term. Some of the areas where we see VR/AR taking off for individuals include gaming, entertainment, socialization and commerce. From an industrial and commercial standpoint, VR/AR is likely to play a bigger role in manufacturing and design, health care delivery and, potentially, remote work (see Exhibit 3).

Exhibit 3: Expect to See VR/AR Adoption Outside of Consumer Sectors

Current VR/AR Market Share
Consumer
Distribution and Services
Manufacturing and Resources
Public Sector
Infrastructure
Other



Source: IDC, Morgan Stanley Wealth Management Global Investment Office as of Sept. 21, 2021

From an individual standpoint, gaming and entertainment are the most obvious current use cases for VR/AR applications. Facebook's Oculus headset and Sony's Playstation VR have become two of the more popular VR gaming platforms. In addition to headsets, game publishers are likely to incorporate AR and VR as part of their user experience—part of their strategy to keep customers engaged in their products. Beyond gaming, entertainment as a whole could benefit from further adoption of VR/AR. Epic Game's *Fortnite* has hosted several digital concerts inside its virtual world. This could help entertainment companies address issues around customers who are cautious about attending crowded events.. According to CNBC, the average cost for a Super Bowl ticket on StubHub in 2020 was \$7,000. At prices like that, the virtual experience provides an opportunity to “attend” this type of an event when it may not be economically feasible otherwise.

While the idea of a virtual concert may not sound appealing to some—what about a virtual field trip? Throughout COVID-19, with educators adapting to remote schooling, the need to engage students in new ways was a key area of focus. While the idea of virtual field trips and events may sound odd to some, the current generation of children will grow up with these experiences already being a part of their lives. This could ultimately drive more adoption of virtual events. For several years now, many museums have offered virtual tours—a tool that was well-received by educators working remotely during the pandemic. One of the key drivers for VR/AR will be socialization—the experience and feeling of being somewhere with other virtual users in real time—becoming a bigger component of the technology.

Outside of entertainment, VR/AR is being used actively in commerce, a trend that appears likely to accelerate as e-commerce continues to grow and disrupt the retail industry.

VR/AR has use cases on both ends of this physical/digital spectrum. In physical retail locations, customer interactions can be mapped and analyzed in real time to offer insights on product placement, store design and layout, and customer perspectives on current inventory, thereby allowing physical retailers to be more competitive with e-commerce players that can easily obtain shoppers' user data. From an e-commerce standpoint, this allows customers to virtually try on clothes or check out an automobile they are considering purchasing. While most real estate transactions still feature physical property tours and inspections, brokerage firms have been able to attract customers to their properties by providing pictures and information about their listings—another avenue for VR/AR.

In industries with heavy machinery or hazardous work environments, VR/AR is being used to train workers on machine operation and safety protocols. Elon Musk and his engineers at SpaceX use these technologies to examine and design parts of their rocket engines in 3D. They can move and manipulate the components of the engines virtually as if they were touching a physical engine—a method that the automotive industry also uses when designing certain components.

In the health care industry, VR/AR has been used to help treat soldiers with post-traumatic stress disorder, and *The New York Times* recently reported that Weill Cornell Medical Center used VR/AR headsets in intensive care units during the pandemic to bring additional expertise into the room without risking exposure to the virus.

Another area that is ripe for VR/AR adoption is in, or rather out of, the office. In recent years, large companies have started to host first-round interviews in automated digital formats, which not only streamline the hiring process, but expand capacity to interview additional candidates. VR/AR could also help drive traffic into meetings and events with historically low attendance, such as Parent Teacher Association and city council meetings. Allowing users to “attend” these meetings without the commitment of being physically present could help drive community engagement.

Looking even further out, as the world becomes more automated, commuting could eventually be autonomous, resulting in more time for people to get work done, relax or socialize. As a result, autonomous cars could serve as a primary place of use for VR/AR technology. So, how big could this opportunity be? International Data Corporation (IDC), a market intelligence group for the tech industry, expects a 54% compound annual growth rate in total VR/AR spending through 2024, reaching \$72.8 billion, from \$12 billion in 2020.

What Gets Us There—Hardware, Networks, Consumer Willingness

While the use cases described above are fascinating, and there are likely many more that we cannot yet picture, ultimately the success and pace of VR/AR adoption likely will depend on two things: 1) technology advancement and 2) user willingness and acceptance. On the technology front, expensive hardware is required to make VR/AR work seamlessly. As VR/AR technology adoption grows and more companies enter the space, this could put pressure on consumer hardware costs, ultimately driving them down, which could allow for faster integration. For VR, that likely would entail a separate dedicated device, e.g., a headset, wearable clothing, like gloves, or multiple cameras to capture movement, with complex processing capabilities, such as those supplied by a graphics processing unit, with enough power to support the intense needs of a VR environment. For VR to function, refresh rates on visual output generally must exceed 90 frames per second (anything less can cause eye strain or trigger motion sickness in users). For some AR applications, dedicated equipment may not be necessary, as users may be able to leverage functionality from their smartphones or other devices, though more complex applications will require separate hardware. AR glasses have been explored, for instance.

Technology needs go beyond just hardware, however. For the concept of the metaverse to work, large amounts of data will need to be transmitted wirelessly, compressed and stored. Data transmission and storage efficiency will be a key limiting factor on how far the metaverse can be extended. Further, users will need to be able to connect their devices from anywhere, so expanding coverage of ultra-high speed internet will be necessary. While networks have greatly improved in recent years, progress will still be needed to facilitate the transfer of vast amounts of data generated by VR/AR applications.

Finally, even as hardware and networks improve, technology advancements alone will not be enough to make VR/AR successful. Like any new technology, there could be network effects, and user acceptance and consumer willingness to try new products could dictate how quickly (or slowly) VR/AR becomes ubiquitous. Ultimately, user adoption of VR/AR applications will likely be impacted by how useful these applications are: Do they add enough to the experience to warrant using? How difficult is it to gain access? In other words, is separate hardware required and at what price? Like many new technologies, there will likely be a network effect component to the pace of adoption, with rapid growth in new users coming as these platforms hit scale.

Given the heavy investment needs for both applications and hardware, much of the near-term success of VR/AR will likely

be driven by some of the biggest players in tech today, such as Facebook, Snap, Alphabet or Apple, developing services that people want to use. On the hardware side, companies like Apple will be incredibly important: Can users access these applications simply from their iPhone, iWatch or AirPods, or do they need additional devices? Further, can a company like Apple integrate new technology into its existing ecosystem? The rapid growth of air pods shows Apple can sell its customers new and additional hardware, but building a new category isn't easy.

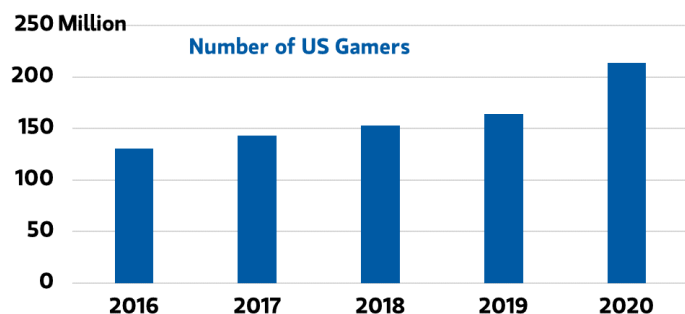
While many of the hardware components involved in VR/AR rely on semiconductors—an industry that has been experiencing shortages since the onset of the pandemic—we feel the impact to adoption has been minimal at this point. The companies involved in VR/AR currently derive small portions of their revenue directly from VR/AR offerings. Longer term, we expect semiconductor shortages to diminish, as new fabrication facilities come online and supply chain issues from COVID-19 fade. For more information on semis, refer to the March 10 report, "[Semiconductor Outlook: Putting Our Chips on the Table](#)."

Key Players—Investment Opportunities for VR/AR

While it may be too early to know who the leaders in VR/AR will be, we can take cues from companies that are already involved in the area, or that could become key early players in the market with some investment.

Lines between video games and social media are already starting to blur. Morgan Stanley & Co. Research estimates that in fiscal year 2020, COVID-induced lockdowns resulted in a pull forward of four years of gamer adoption, in terms of player bases, time spent playing games and in-game revenue growth. In the US, there have historically been 11 million new gamers each year, but in 2020, 50 million new gamers came "online" (see Exhibit 4). An estimated 50% of Americans play video games, mostly for entertainment. According to a survey conducted by MS & Co. Research, 30% of existing gamers now use video games as a means of socializing with friends and family as opposed to competitive gamers and those playing to improve their gaming skills. More than 25% of these "social gamers" cited video games as their preferred social media venue. Don't expect leading gaming publishers, such as Electronic Arts (EA), Activision Blizzard (ATVI), Take-Two Interactive Software (TTWO), and gaming design platforms, such as Unity Software (U), to squander this acceleration in gaming.

Exhibit 4: Gaming Is a Secular Trend That Saw Outsized Adoption in 2020



Source: MS & Co. Research, Morgan Stanley Wealth Management Global Investment Office as of Sept. 21, 2021

Roblox (RBLX) offers a platform that allows software developers to produce multiplayer gaming experiences. This platform is blurring the lines between gaming, social media and virtual worlds. RBLX's daily active users are online for an average of 154 minutes per day, versus 40 minutes for Facebook and 150 for console gamers. RBLX users also send an average of 63 messages per day over its platform, versus Whatsapp, through which users send an average of 50 per day. Nintendo (7974.T) released *Pokémon Go* in 2016, resulting in one of the first mainstream successes for AR gaming. With the rise of smartphones, mobile-focused game developers, such as Zynga (ZNGA) and Playtika (PLTK), have benefitted as phones have transitioned from means of communication to means of entertainment. With these companies producing games that operate on mobile phones, they are likely candidates for bridging into other forms of connectivity—whether messaging and communication or adopting VR/AR technologies in their games.

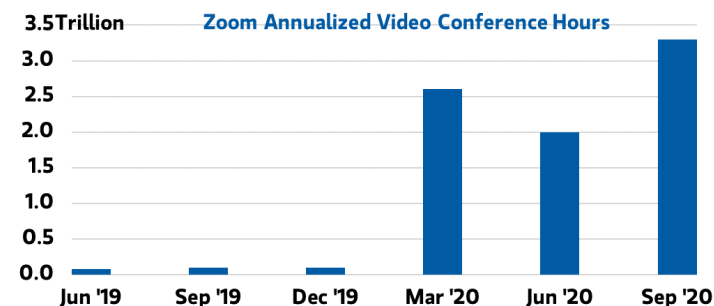
Video game publishers will be looking for ways to keep their new and existing in-game content fresh, to retain these new customers. One-way video game publishers will be able to do so is by engaging digital player bases across multiple screens and formats. That may be across different brands of gaming consoles or across gaming formats of PCs, mobile phones or consoles. Some of these changes are already happening. For instance, with the success of *Fortnite*, Activision Blizzard launched a competitor product for its *Call of Duty* franchise, *Call of Duty: Warzone*. The success of *Fortnite* and *Call of Duty: Warzone* offer a step forward in the adoption of virtual worlds. While massive multiplayer online role-playing games (MMORPGs), such as Activision Blizzard's *World of Warcraft*, have supported millions of online players operating in virtual worlds where they have the option to trade goods, interact and play with one another, markets have opened outside of the virtual setting of *World of Warcraft* as well, giving players the ability to buy and sell equipment and goods they acquire in games.

World of Warcraft requires an annual subscription to play. However, *Fortnite* and *Call of Duty: Warzone* offer a free platform, on which users can purchase in-game upgrades. Aside from the revenue models of these games, they offer a shift to platforms where users can “hang out” versus actively playing a game, and this could create further integration from social media companies and digital advertisers. Companies like Unity Software, which offers a high-performance platform called Unity Engine for creating digital games and worlds, could be used outside the gaming space to create interactive digital worlds for activities like business and socializing.

From a consumer technology and social media perspective, many well-known companies are actively developing products that will serve as the means to interact in these virtual and digital worlds. Facebook (FB) offers its Oculus headset, while Snap (SNAP) offers AR filters that can be overlaid with a smartphone's camera. As mentioned above, video game developers are looking for ways to keep their users engaged. The same can be said for social media users of Facebook and Snap.

While Apple (AAPL) provides hardware exposure to mobile games, communication and social media, it also offers a platform for developers who are looking to design more engaging application experiences that implement VR/AR technology. The LiDAR technology that is built into iPhone and iPad products allows for engagement in the user's surroundings. Microsoft (MSFT) has exposure to VR/AR through several verticals: First, it provides the operating system for PCs, which are increasingly more connected and used for gaming, social media and other forms of interaction. Second, Microsoft owns Xbox, its high-end gaming console system. Third, it sells its own VR headset, called the HoloLens. As social media, gaming and physical interactions continue to blend, expect to see Microsoft leverage these technologies and platforms to facilitate the transition. Alphabet (GOOGL), another technology giant, needs little introduction. While its core products facilitate information sharing and connectivity, it also has several hardware products aimed at VR/AR integration, such as Google Glasses and Google Lens, supported by an AI-powered technology that integrates with smartphone cameras.

Exhibit 5: COVID-19 Sped Up Digital Adoption Trends, Resulting in a Zoom Boom



Note: Annualized video conference hours represents Zoom's reported annualized meeting minute run rate, which is calculated by multiplying the quarter-ending month's exit meeting minutes by 12
Source: Zoom Video Communications, Morgan Stanley Wealth Management Global Investment Office as of Sept. 30, 2020

While the pandemic clearly benefitted digital companies (see Exhibit 5), Zoom Video Communications (ZM), Disney (DIS) and Netflix (NFLX) could evolve their primary offerings.

These are platforms—whether video conferencing through Zoom Video Communications or streaming videos and movies on Netflix and Disney+—that could easily take cues from video games, as they look to blend user experience into social media and broader interaction. It doesn't take much imagination to think of the next level of Zoom Video Communication's video chats taking place in a virtual reality setting instead of over a phone screen or computer monitor. Netflix and Disney could use VR/AR to engage their audience and drive the entertainment experience—the feeling of being in a movie theater from the comfort of your own couch.

Disney could also integrate VR/AR into their theme parks, creating physical and virtual experiences for attendees.

What do all these companies have in common? They are branching out from offering a core product or service to turning them into platforms or parts of broader connected digital ecosystems. Aside from already being directly or tangentially involved in the VR/AR space, all of these companies benefit from huge existing user bases, which is an advantage over emerging technology providers. As a result of the shift to VR/AR, there are several technologies and trends that could see continued benefits from VR/AR adoption (see Exhibit 6). As we have written in past editions of *AlphaCurrents*, a more digitally connected world will offer more opportunities for cyberattacks, and investors could benefit from opportunistic exposure to CyberArk (CYBR), Microsoft (MSFT), Palo Alto Networks (PANW) and Sailpoint Technologies (SAIL). For more information on cybersecurity, refer to the July 6 report, "[Growth Hack: Investing in Cybersecurity](#)." Increased digitalization will require high-speed wireless connectivity that will be powered by 5G, as we wrote in the February 11 report, "[5G: A New Era of Communication](#)." For investments related to 5G and digital infrastructure, we recommend adding exposure to American Tower (AMT), Crown Castle International (CCI), Cyrus-One (CONE), Digital Realty Trust (DLR), and Equinix (EQIX). Finally, growth in consumer electronics should drive semiconductor sales, and as a result, we recommend Applied Materials (AMAT), KLA Corp. (KLAC), Lam Research (LRCX) and Teradyne (TER).

Exhibit 6: Companies That Are Either Directly or Tangentially Involved in VR/AR

Segment Involved in VR/AR	Companies
Big Tech	AAPL, FB, GOOG, MSFT, SNAP
Video Games	ATVI, EA, PLTK, RBLX, TTWO, U, ZNGA, 7974 JP (Nintendo)
Communications (ex Social Media)	ZM
Streaming Entertainment	DIS, NFLX
5G	AMT, CCI, CONE, DLR, EQIX
Cybersecurity	CYBR, MSFT, PANW, SAIL
Semiconductors	AMAT, KLAC, LRCX, TER

Source : Morgan Stanley Wealth Management Global Investment Office as of Sept. 21, 2021

Regulatory Watch

Many US consumer technology and internet companies have flourished under minimal regulation. Over the past few years, however, antitrust lawsuits have continued to be brought against these companies. With public opinion shifting in favor of a need for more regulation, many companies involved in VR/AR today could be affected. As these technologies grow and become intertwined in the broader metaverse; there could be increasing regulatory focus. Domestically, we do not see this impacting the market for VR/AR today; but tides turn quickly, and recent actions in China highlight how fast shifts can occur.

Recently, the Chinese government implemented a broad ban on children's use of video games during the school week. This ban only allows children to play video games for one hour a day—on Fridays, weekends and public holidays. In the immediate term this could have some effect on game publishers with China exposure—for instance, Activision Blizzard, which generates 5% of their annual revenue in China, and Electronic Arts and Take-Two, which generate 13% and 10%, respectively. While regulation may influence video game sales regionally in the short term, we do not expect it to

impact longer-term adoption of VR/AR.

The Big Picture

While the metaverse is not likely to come to fruition for many years, companies are taking incremental steps to drive VR/AR technologies into the mainstream. For companies involved in this area currently, VR/AR is not their primary focus, but we expect it to become fully integrated as a feature of their core products.

As the technology improves and undergoes further adoption, new competitors will likely emerge, which could materially impact the products and services currently offered by companies involved in VR/AR. Regardless, we are excited about what the future holds for VR/AR and the potential metaverse, and we expect there will be many opportunities for investors to participate in this technology shift over the years. For more information about VR/AR or any company mentioned in this report, contact your Morgan Stanley Wealth Management Financial Advisor.

ALPHACURRENTS

Securities mentioned in this report:

Activision Blizzard (ATVI; \$73.03; MS & Co. Rating: Overweight/In-Line)
Alphabet (GOOGL; \$2780.60; MS & Co. Rating: Overweight/In-Line)
Applied Materials (AMAT; \$135.18 MS & Co. Rating: Equal-weight/In-Line)
American Tower (AMT; \$291.87; MS & Co. Rating: Equal-weight/In-Line)
Apple (AAPL; \$143.43; MS & Co. Rating: Overweight/In-Line)
Crown Castle International (CCI; \$187.78; MS & Co. Rating: Overweight/Attractive)
CyberArk Software (CYBR; \$164.01; MS & Co. Rating: Overweight/Attractive)
CyrusOne (CONE; \$77.92; MS & Co. Rating: Overweight/Attractive)
Digital Realty Trust (DLR; \$157.16; MS & Co. Rating: Equal-weight/Attractive)
Electronic Arts (EA; \$126.76; MS & Co. Rating: Equal-weight/In-Line)
Equinix (EQIX; \$848.20; MS & Co. Rating: Equal-weight/Attractive)
Facebook (FB; \$357.42; MS & Co. Rating: Overweight/In-Line)
KLA Corp (KLAC; \$356.58; MS & Co. Rating: Equal-weight/In-Line)
Lam Research (LRCX; \$586.22; MS & Co. Rating: Overweight/In-Line)
Microsoft (MSFT; \$294.80; MS & Co. Rating: Overweight/Attractive)
Netflix (NFLX; \$573.14; MS & Co. Rating: Overweight/In-Line)
Nintendo (7974.T; ¥52660; MS & Co. Rating: Overweight/In-Line)
Palo Alto Networks (PANW; \$473.03; MS & Co. Rating: Overweight/In-Line)
Playtika (PLTK; \$48.26; MS & Co. Rating: Overweight/In-Line)
Roblox (RBLX; \$26.14; MS & Co. Rating: Overweight/In-Line)
Sailpoint Technologies Holdings (SAIL; \$45.40 MS & Co. Rating: Overweight/Attractive)
Snap (SNAP; \$76.09; MS & Co. Rating: Overweight/In-Line)
Sony Group (6758.T; ¥12340; MS & Co. Rating: Overweight/In-Line)
Take-Two Interactive Software (TTWO; \$145.72; MS & Co. Rating: Overweight/In-Line)
Teradyne (TER; \$115.98 MS & Co. Rating: Overweight/In-Line)
Unity Software (U; \$131.00; MS & Co. Rating: Equal-weight/In-Line)
Walt Disney (DIS; \$171.17; MS & Co. Rating: Overweight/In-Line)
Zoom Video Communications (ZM; \$278.24; MS & Co. Rating: Overweight/Attractive)
Zynga (ZNGA; \$7.66; MS & Co. Rating: Overweight/In-Line)
Prices as of market close on Sep. 21, 2021.

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Not Covered (NC): Indicates that the analyst does not cover the fund.

Closed-End Fund Ratings Distribution (as of date August 31, 2021)

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Closed-End Fund (CEF) Rating Category	CEF Coverage Universe		Investment Banking Clients (IBC)		
	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight/Buy	31	36.9%	18	37.5%	58.1%
Equal-weight/Hold	38	45.2%	23	47.9%	60.5%
Underweight/Sell	15	17.9%	7	14.6%	46.7%
Total	84	100.0%	48	100.0%	

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