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GAME ON:
The New Golden Age for Video Games

>> Video games have become mainstream forms of consumer entertainment

>> Mobile gaming has expanded the addressable global market

>> User engagement statistics show that leading game titles are gaining "market share" of leisure time

>> The industry is less cyclical than ever before

>> Game publishers have successfully developed new, high-margin revenue streams

>> Modified Reality (AR/VR) is a potentially huge long-term opportunity for the game industry

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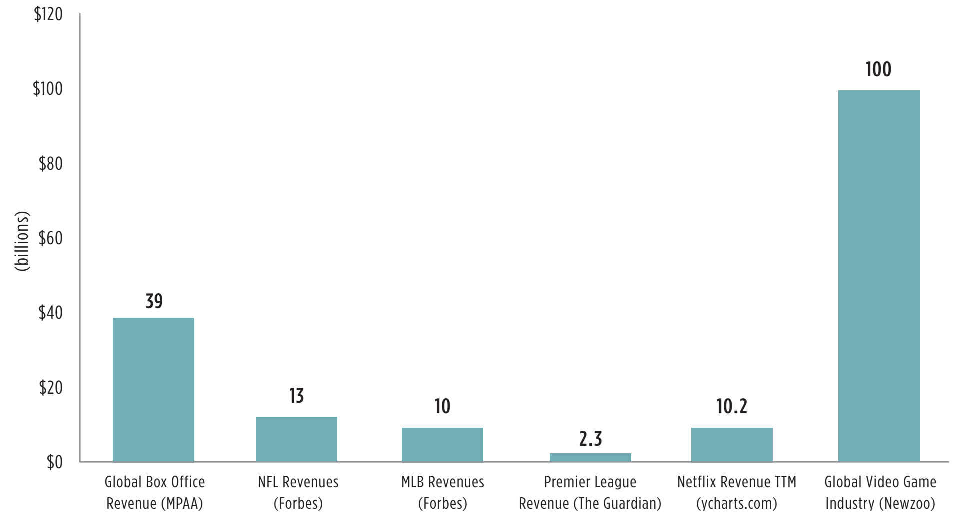
Over the past four decades, video games have emerged from basements and coin arcades into the global mainstream. The first video games sported crude black and white, two dimensional graphics. Today's game offerings include premium console and PC-based titles featuring huge, photorealistic worlds that can take literally years to explore, as well as a vast array of smartphone-enabled mobile games. As the technology driving them has advanced, videogames have also become an increasingly-ubiquitous and profitable entertainment medium. The number of video gamers worldwide has exploded from 100 million to over 2 billion since 1995, implying that more than 70% of the world's 3.7 billion internet users are also gamers (source: Statista). More importantly for investors, the video game industry now generates a large and growing stream of revenues totaling more than $100 billion annually (source: Newzoo).

Media Revenues

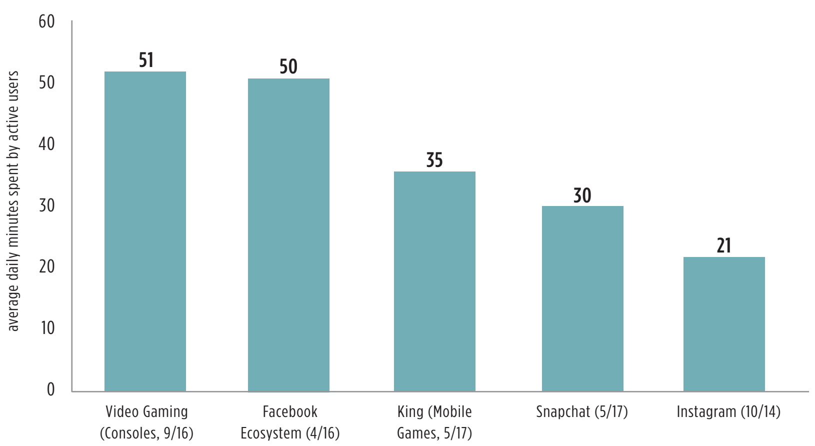


Source: Newzoo

Video gaming has helped shape the arc of modern popular culture, and the industry has spawned movie franchises, best-selling books, and toy lines. Game characters have become some of the most recognizable faces on the planet. In 1981, Nintendo's humble plumber Mario made his debut in the Donkey Kong arcade game. Despite the fact that he is more than 50 years "younger" than the world's most famous rodent, Mario is now a more-recognizable character than Mickey Mouse (source: Iwabuchi, 2002). A medium that was once seen as a niche for nerdy and reclusive teenagers is now firmly enmeshed in public consciousness.

Video games are a uniquely engaging form of entertainment. According to Global Web Index, the number of minutes per day spent using video game consoles now exceeds the time spent on Facebook. Activision Blizzard's King Mobile division reports that its users spend more time on their mobile games than they do interacting with either Snapchat or Instagram. Increasingly, it seems consumers are spending more of their leisure time consuming streaming and interactive forms of media. The share of this type of consumption seems poised to grow, eating into the time spent on other types of leisure activities. Some researchers even link increasing videogame engagement with data showing a decline in overall workforce participation and average weekly hours spent working. A 2017 working paper from researchers at Princeton and the University of Chicago (source: Leisure Luxuries and the Labor Supply of Young Men, Aguiar) found that time spent gaming explains nearly 80% of the difference in workforce participation between young men and their older counterparts.

Daily Minutes Spent Per User Across Select Digital Media Platforms



Source: Kleiner Perkins, 2017

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Current Landscape: Consoles, Mobile, PCs

Console Gaming: The Incumbent

Video game content consumption has undergone major changes over the last 35 years. The era of video game consoles kicked off with the 1982 launch of the Atari 2600 and has evolved through several generations, including the Nintendo Entertainment System, Sony PlayStation, and the Nintendo Wii. Today's immensely powerful Sony PS4 and Microsoft Xbox One consoles dominate the console market, and they support ultra HD video quality, ample hard drive storage, and full broadband access.

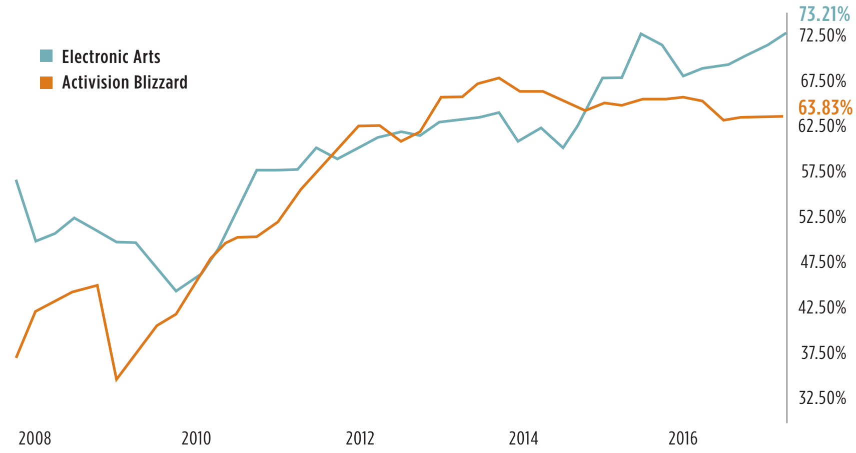
Traditionally, console manufacturers maintained a practice of selling their state-of-the-art machines at a loss or breakeven. They then sought to make up the difference on software sales and licensing fees. This resulted in a natural - and sometimes unpleasantly lumpy - cyclicality to game sales. Gamers tended to hold back their purchases of consoles and content as newer-generation launches approached. Likewise, console sales have tended to go through cycles when Microsoft and Sony released a new generation of hardware. We are generally considered to be in the third major console cycle since the initial launches of the Xbox and PlayStation 2 in the early 2000's.

The current generation of game consoles has exhibited less cyclicality for the industry than previous iterations. First, the prevalence of broadband internet speeds in households has enabled consumers to download game content from the Web versus purchasing physical units. Until just a few years ago, publishers put the vast majority of their content on discs for sale in physical retail locations. The continual guesswork of how many discs to produce for any given game could make or break quarterly results for game publishers. Now, thanks to wide availability of fast internet connections, gamers can download complete games over the internet in a relatively short amount of time. For most consumers, there is no longer any need to visit a physical retailer to purchase content. For leading publishers like Activision Blizzard, Electronic Arts, and Take-Two Interactive, the shift to digital distribution reduces guesswork and removes costs related to manufacturing, inventory management, packaging, and shipping. All of this works to make sales results more predictable, while supporting higher gross margins.

Internet distribution has also allowed publishers to sell add-on content and "micro-transactions" for games to create new and growing revenue streams. Convincing engaged customers to pay $2 for a custom avatar or $10 for a new level of their favorite title has proven to be a relatively easy sale for the major publishers.

Secondly, the console manufacturers have moved away from relying on next-generation console launches to drive sales. Both Sony and Microsoft's current versions of their consoles were launched in November 2013, and neither have plans to launch truly next-generation versions until 2019 or 2020. In the past, Microsoft, Sony, and Nintendo would launch next-generation consoles which would remain essentially unchanged for their 5-8 year sales lifecycle. The new consoles from Microsoft and Sony are changing this pattern. Borrowing a page from the playbook of Apple's iPhone, manufacturers are now opting to offer incremental software updates over the internet, as well as offering different models of the same console that offer varying tiers of performance and capabilities.

Gross Profit Margin (TTM) for Electronic Arts and Activision Blizzard



Source: YCharts

Mobile Gaming: The Upstart

An estimated 44% of people worldwide own a smartphone, and that number is projected to reach 70% by the end of the decade (source: Ericsson Mobility Report 2017). Put another way, by 2020 approximately 5 billion people will carry a perfectly capable gaming device in their pocket. While gaming on a $400 console or $2000 PC will likely remain popular for years, mobile is the fastest-growing gaming segment. Right now, 35% of gamers indicate they regularly play on smartphones. That number is expanding rapidly, and game developers are taking notice. Companies like Activision Blizzard and Electronic Arts, the two largest console game publishers, have taken serious steps to get a foothold in mobile games. With the $6 billion purchase of King Digital in late 2015, Activision Blizzard signaled that mobile gaming is not a passing fad but a major market segment and a foundation for expansion of their business model.

In a world that is increasingly connected, it makes sense that gaming would begin to shift to mobile. It is estimated that 90% of the world has access to 3G coverage and 50% will have access to 4G coverage by 2020 (source: Ericsson Mobility Report 2017). The costs associated with mobile devices are much lower than a console or PC, making them a prime gateway for gaming in the developing world. The iPhone 7 has significantly more processing power than both the gaming consoles from 2 cycles ago and the average personal computer from 5 years ago. Improved processing power and broadband availability has also made mobile devices a great way to experience high-quality video games for consumers who lack the means to afford a console or computer.

The cult-like popularity of games like Candy Crush, Words with Friends, and Pokémon Go speak to the power that mobile games can have. The people playing these games do not fit neatly into the stereotypical category of gamers. Rather, they are grandmothers, housewives, businessmen – many of whom would never view themselves as videogame aficionados. Game publishers hope to use mobile offerings as a gateway to convert some of these casual players into more serious gamers who will engage with content on a console. Developers are pursuing this goal by taking games that have a wide following on console or PC, and developing slimmed-down versions for mobile devices. Popular console and PC games like Grand Theft Auto, FIFA, Tomb Raider, Madden NFL, and Minecraft have all made a successful transition from console or PC to mobile.

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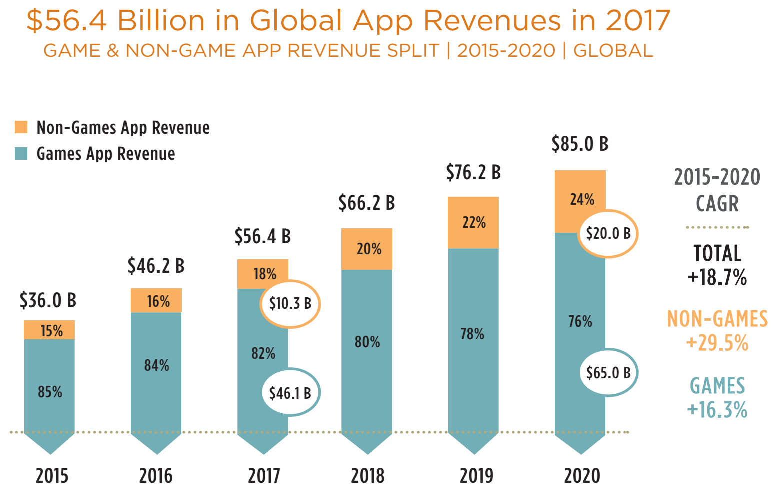
Mobile games are particularly attractive because they offer three different pathways to monetize content: upfront purchases, in-game advertising, and ongoing incremental revenue from micro-transactions. Lower price points and wide smartphone penetration are helping the mobile game industry grow faster than the PC and console markets. In 2017, projected mobile gaming revenue will grow 8% year-over-year, will generate over 80% of all global app revenue, and will constitute more than 40% of global video game sales (source: Newzoo).



Source: Newzoo and the Global Mobile Market Report 2017

PC Gaming: Slow Growth, Big Spending

PCs are becoming less important as personal computing devices thanks to the rise of mobile devices, but they are still a large portion of the global video game industry - making up just under 30% of total revenue.

PC games and hardware are becoming more sophisticated and so are the gamers. Serious gamers are willing to spend thousands of dollars to keep their gaming “rig” competitive with others across the globe. Suppliers like NVIDIA have been winners thanks to gamers’ obsessive desire for more computing and graphics processing power to give them an edge over other gamers. NVIDIA’s top of the line processors can cost more than $1,000. When paired with a top of the line CPU, monitor, and peripherals, a high-end gaming PC can cost in excess of $5,000.

We know that gamers are willing to spend serious money on their gaming experience and that mentality extends further than just consoles, PCs, and games. Peripheral equipment - controllers, headsets, keyboards, mice, and virtual reality rigs are becoming more important as the popularity of “eSports” soars. Elite level competition leads to players looking for any edge they can get. Major companies like Logitech and Bose are spending to gain a foothold in the rapidly growing space where elite-quality keyboards and headsets can cost $200 and $400, respectively. The bet on peripheral equipment has paid off so far - Logitech’s revenue tied to gaming peripherals grew 40% in the second quarter of 2017.

The Next Decade and Beyond

Modified Reality: The Next Big Thing

As long as humans have lived together in communities, we have loved stories. From ancient folk tales and fables shared around the communal fire, to ancient epic stories committed to paper or papyrus by hand, on through the age of printing press, radio, television, movies, and video games, we have relied on the advancement of technology to make the stories we share ever more immersive and compelling. We see Modified Reality (Augmented/Virtual Reality, or AR/VR for short) as the next technological innovation that will advance the way we consume entertainment and share stories.

VR has been available to consumers in some form since the 1980s, but broad adoption has thus far been held back by high prices and technology limitations that make the experience too expensive for most and physically uncomfortable for some. Thanks to advances in processing power and display technology, VR experiences are finally on the brink of becoming affordable and compelling for both consumers and manufacturers. Companies like Samsung, HTC, Sony, Facebook, Microsoft, and Google are now manufacturing their own VR headsets for consumer use.

Facebook's Virtual Reality Heaset, Oculus Rift

The near-term path of VR is somewhat uncertain, as manufacturers are pursuing different strategies. Google is selling a $15 headset made of cardboard that converts an Android smartphone into a VR headset. HTC's Vive and Facebook's Oculus VR headsets cost several hundred dollars, and rely on a powerful PC (minimum $1500 investment) to function. Sony's $350 PlayStation VR headset works exclusively with the PlayStation 4. Microsoft is focusing on delivering an AR experience via their HoloLens headset, which displays computer-generated images that are superimposed over the user's physical environment. Their approach is attracting a lot of excitement for its wide array of possible applications in gaming and beyond (watch this HoloLens demo video to see how impressive this effect can be).

With respect to the gaming industry, Modified Reality is subject to the classic "chicken and egg" problem. Publishers will not spend tens of millions of dollars to develop VR or AR titles unless they are convinced that there is a critical mass of consumers who possess the necessary equipment to enjoy the experience. But consumers are not likely to purchase headsets or hardware without the creation of a "killer app" that compels them to do so.

We expect that Modified Reality will reach a positive inflection point within the next 24-36 months, as hardware price points move lower, processing speeds continue to increase, and more content creators embrace the medium. If we are correct, we could be in the very early innings of a new wave of media and gaming content that could have significant implications for investors.

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ESports: A Bigger Deal than You Think (...and getting bigger by the day)

Gamers have been competing against each other since the 1980s, when Atari hosted the Space Invaders Championship. Today, professional gamers play both individually and on teams in worldwide tournaments that are broadcast online. "ESports" is the umbrella term used to describe competitive video gaming, which often refers to organized competition between teams of professional gamers. Competitions span a wide variety of styles and genres, including real time strategy (StarCraft II), first person shooter (Counter-Strike), multiplayer online battle arena (League of Legends and Dota 2), fighting, sports, and racing.

Amazingly, the popularity of eSports is beginning to rival that of traditional live sports. Consider that 111 million people watched the last Super Bowl on television, which was attended by 71,000 live viewers in the stadium. In the spring of this year Intel and the Electronic Sports League hosted the Extreme Masters tournament which features competition across several video game titles. The tournament drew 43 million streaming viewers, and over 173,000 fans watched the event in person. Exploding eSports viewership is attracting enough interest that ratings measurement company Nielsen is launching an eSports division to more accurately measure viewership and revenue numbers.

Tournament prize purses have grown along with the popularity of eSports. A major Dota 2 championship played last year had a total prize pool of nearly $21 million, and the League of Legends world championship had a $5 million pool for winners. In comparison, the 2017 Masters Tournament had a total prize purse of $11 million.

Top 5 Most Played eSports Games in 2016

Counter-Strike: Global Offensive
NUMBER OF PROFESSIONAL PLAYERS: 6071
PRIZE MONEY AWARDED: **£18,988,810 from 1946 tournaments**

League of Legends
NUMBER OF PROFESSIONAL PLAYERS: **4311**
PRIZE MONEY AWARDED: **£29,150,640 from 1766 tournaments**

Counter-Strike
NUMBER OF PROFESSIONAL PLAYERS: **2587**
PRIZE MONEY AWARDED: **£8,621,720 from 572 tournaments**

Dota 2
NUMBER OF PROFESSIONAL PLAYERS: **1693**
PRIZE MONEY AWARDED: **£70,293,464 from 645 tournaments**

StarCraft II
NUMBER OF PROFESSIONAL PLAYERS: **1588**
PRIZE MONEY AWARDED: **£16,909,794 from 3929 tournaments**

There are now more than 30 major eSports leagues, with more on the way. Certain popular titles like Activision Blizzard's Overwatch and Riot Games' League of Legends have their own leagues, while larger established leagues like Major League Gaming and the Electronic Sports League sponsor competitions featuring several games from a variety of publishers.

Activision Blizzard's Overwatch, a team-based first person shooter, launched last year to huge acclaim. The game won several "game of the year" awards and holds a 91 rating on Metacritic.com, making it one of the top 5 reviewed games of 2016. Activision Blizzard has capitalized on the game's popularity by creating an Overwatch eSports league for launch. The league will follow a city-based format similar to traditional major team sports. Players can be recruited from more than 30 million Overwatch players and the league has even provided scouting reports to teams. Player contracts are one year guaranteed with a league minimum salary of $50,000 per year with mandatory health insurance and retirement benefits. Similar to other professional sports leagues, teams will offer incentives for superior performance, with the league requiring at least 50% of winnings be distributed to players.

The economics of eSports are beginning to reflect the growing scale of the genre. As of July 2017, nine Overwatch teams have been announced at a reported franchise cost of up to $20 million apiece. Notable professional sports team owners like Robert Kraft (New England Patriots), Stan Kroenke (Los Angeles Rams, Denver Nuggets, and Arsenal F.C.), and Jeff Wilpon (New York Mets) have already secured their teams in the Overwatch league. Globally, teams have been announced in locations spanning from New York City to Shanghai.

Professional teams from live sports are beginning to recognize eSports potential as well. Several European soccer clubs have signed professional gamers to represent them in eSports competitions for Electronic Arts' FIFA Interactive World Cup. Manchester City, West Ham United, Borussia Dortmund, and Bayern Munich have all hired professional FIFA players to promote their club. The NBA's Philadelphia 76ers are buying eSports teams outright. The two teams they have purchased compete in games outside of traditional sports titles, including previously mentioned League of Legends, Counter-Strike, and Overwatch. The 76ers' managing partner indicated that their investment in eSports is an extension of their other investments in sports and entertainment. We believe other sports teams and leagues will follow suit as they seek to pursue new avenues to reach untapped audiences.

One projection expects the eSports economy to generate $500 million in revenue this year and more than $1.1 billion by 2019 (source: Newzoo). By comparison, North America's MLS generated $550 million last year (source: Forbes, 2017).

The winners of "The International 2014" Dota 2 tournament and Jordan Spieth who won the 2015 Masters Tournament.

For some elite gamers, eSports earnings can rival those of traditional mainstream professional athletes. With sponsorships from large advertisers, team salaries, and prize money, elite gamers can earn well more than $1 million per year. Perhaps one of the more interesting examples that demonstrates the growing legitimacy of eSports is the fact that gamers are now being granted P-1 visas to enter U.S.-based competitions. Traditionally, P-1 visas have been granted to foreigners who seek to enter the U.S. to perform in a specific athletic competition. The fact that these special visas are now being made available to top gamers is a reflection of the fact that eSports professionals are now recognized as athletes in their own right - similar to foreign race car drivers, soccer players, or baseball players.

Top Earning Gamers Year-to-Date as of September 2017

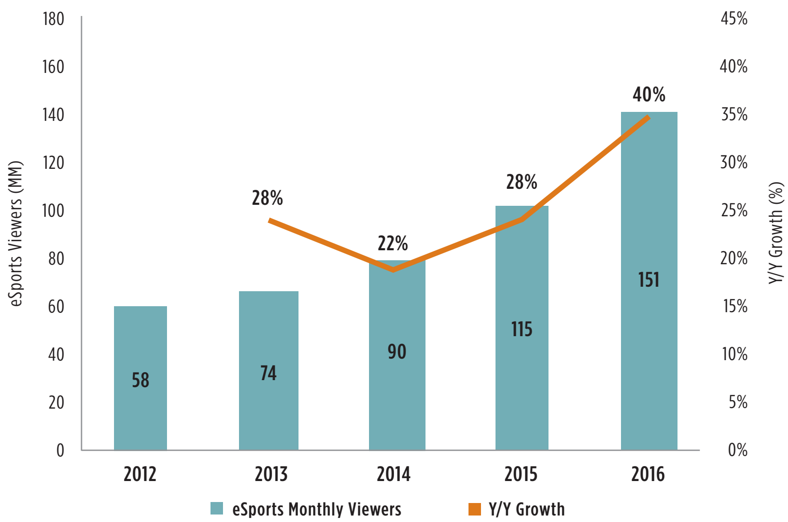
1.	KuroKy	Kuro Takhasomi	$3,367,188.35
2.	Miracle	Amer Barqawi	$2,942,665.85
3.	UNiVeRsE	Saahil Arora	$2,900,960.27
4.	Matumbaman	Lasse Urpalainen	$2,707,376.24
5.	MinD_ContRoL	Ivan Ivanov	$2,703,171.96

Source: esportsearnings.com

American colleges have begun to form varsity eSports teams, with approximately 20 schools offering some form of scholarship. Smaller colleges, mostly in the Midwest, are using the sport to gain media attention and attract students who may not consider attending the school otherwise. League of Legends is the most common collegiate game, and St. Louis' own Maryville University won the national championship in 2016. As more colleges adopt eSports as part of their athletics programs, it may only be a matter of time until they attract regulatory attention from the NCAA.

Game publishers see eSports as a potentially material revenue stream. We expect other publishers to follow the example of Activision Blizzard to create their own leagues or partner with existing leagues. The Overwatch league follows a revenue-sharing model between teams and Activision Blizzard, with the company retaining the ability to sell broadcasting rights. Given the truly global audience for eSports, we expect that these broadcasting rights could prove to be quite lucrative.

eSports Monthly Viewers, Global, 2012-2016



Source: Kleiner Perkins, 2017

According to a survey by LEK Consulting, approximately 75% of eSports fans spend more time watching tournaments online than they do viewing traditional sporting events. Venues like the Barclays Center in New York City are taking notice and making eSports events a priority. Barclays is preparing several event spaces ranging from 200 to 18,000 seats to accommodate eSports tournaments and watch parties. Other major venues are betting on the growth of eSports including MGM Resorts, which plans to open a multilevel eSports arena in its Las Vegas Luxor Hotel & Casino in 2018. As Niklas Rytterstrom, Luxor's General Manager stated in his announcement, "We watched the growth and excitement around eSports... and knew we wanted to get in the game."

Challenges

As the old saying goes, there is "no such thing as a sure thing." We very much like the long-term growth prospects of the video game industry, but there are a variety of challenges that could emerge to impede or delay our bullish outlook. Probably the biggest potential obstacle is posed by the innate scarcity of leisure time. Streaming services like Netflix, social media, and traditional television all compete with video games for their fair share of consumers' leisure time. This means that the industry must continually innovate to create compelling content that will maintain and grow user engagement.

Like any industry that is dependent upon the financial wherewithal of consumers, the video game industry also faces a certain amount of economic risk. A recession or a decline in overall consumer spending could reduce industry sales, and negatively affect trajectory of the growth drivers like modified reality and eSports.

New technologies are inherently risky, particularly to early industry participants. Slower than expected adoption of a new technology can be a death knell for developers and manufacturers. Consumers could also be priced out of new technology, hindering adoption. Nintendo launched the Virtual Boy in 1995 as a precursor to modern VR headsets. But with a high price for the time and underdeveloped technology, the console moved just 770,000 units worldwide and was discontinued just 6 months after its launch. Major game developers and console manufacturers have been cautious on investing in Modified Reality at least partly because of lessons learned from the Virtual Boy failure.

In 1994, players try out Virtual Boy, Nintendo's first virtual reality game console.

The industry also faces the possibility of regulatory risk. In most pleasurable activities, there is the chance of "too much of a good thing." Some gamers display addictive behavior to their games, which can reduce productivity and even lead to serious health risks. As a result, some countries are taking steps to curb video game addiction. Earlier this year the largest newspaper in China ran a story singling out a game published by Tencent for causing wild behavior ranging from theft to self-harm. A recent Bloomberg story said the Chinese government sees the effect of video games on youth "an increasingly urgent social problem." While we see this as being unlikely, any material regulatory measures taken against the industry by a country with a large gaming population (China has 560 million gamers by some estimates) could curb the growth of the industry.

Conclusion

We believe the videogame industry is in a secular uptrend. As global consumers become more connected through advanced networks and smart phones, the addressable market for game publishers should grow significantly over the next decade. We believe future catalysts like Modified Reality and eSports are under-appreciated by most investors, and we think either or both could develop into significant revenue and profit streams for publishers and manufacturers.

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