GLOBAL X MODEL PORTFOLIOS

INVESTING IN THEMATICS FROM A PM PERSPECTIVE

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For institutional use only.

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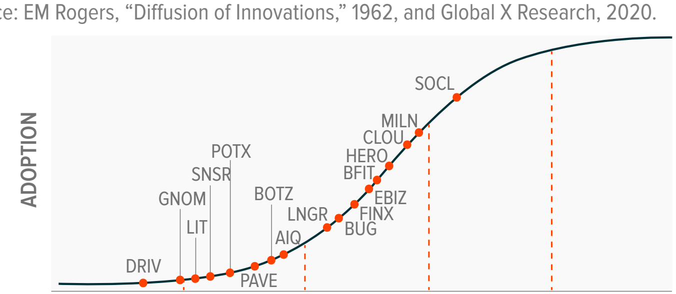
The future is calling, and it wants to video chat. As humans continue to shift focus from atoms to bits, thematics look well-positioned to capture the value created by society's continued evolution. The push towards digitalization lets people do more with less, driving increased capability and convenience as the world grows ever more connected. In this white paper, we identify important themes shaping our world and provide insight into the positioning of our thematic ETF portfolios.

At Global X, we have two ETF model portfolios that target thematic equity, each with a slightly different objective. We created our flagship Equity Thematic Disruptors portfolio with an eye on disruption. We focus on structural themes that we believe are upending various sectors and segments of the broad market. Our Digital Innovation portfolio takes a similar view but narrows the focus to themes that are predominantly linked to increasing digitalization. This portfolio provides a high level of exposure to themes with adoption rates that increased during the COVID-19 lockdowns and remain likely to grow.

Growth in new technologies typically follows an S-shaped pattern of adoption, with the rate of growth accelerating as the product gains mass acceptance, until the eventual decline as the technology becomes pervasive (see chart). Both of our thematic strategies target themes in the Early Adaptors and Early Majority phases, and eventually reduce exposure to themes as they advance into Late Majority territory.

THEMATIC ADOPTION

Source: EM Rogers, "Diffusion of Innovations," 1962, and Global X Research, 2020.



Adoption	Innovators	Early Adopters	Early Majority	Late Majority	Laggards
Growth	Slow	Medium	High	Medium	Slow

Data points along the adoption curve utilize the Global X ETF tickers to represent each theme. This is an indication of thematic adoption within society. This analysis is as of June 2020 and is subject to change. The curve does not in any way reflect past or future performance of the ETFs.

Used standalone or as satellite strategies, our thematic approach strives to position portfolios for the future. This paper will provide an overview of the themes situated within our two thematic strategies at the time of publication. Our portfolios are actively managed (not static) and will enter and exit themes over time. As such, not all themes available will be directly represented at a given time. For more information on Global X Model Portfolios, including allocations, please consult our Advisor Login.

INTERNET OF THINGS

Sparked by the continued miniaturization of microprocessors and other silicon components, The Internet of Things (IoT) looks to update everyday objects for the world to come. Surprisingly, more than 9.5 billion Internet-connected devices, not including computers and smartphones, were in use as of 2019. By 2025, IoT technology may be worth as much as $6.2 trillion—yes, trillion with a T.[2]

This multi-trillion-dollar market will go well beyond smart coffee makers to factories, healthcare, and a host of other businesses. Intel, a company at the heart of IoT tech, estimates that over 40% of IoT devices will be involved in manufacturing. From monitoring feedstock at multiple locations for just-in-time delivery to robotic maintenance, IoT will be core to the world's automated future. Healthcare, which is expected to make up the next 30% of IoT devices, may be disrupted by remote monitoring systems, ingestible sensors and drug management devices, among others.[3]

Central to IoT is the idea of integration, where the whole is actually more than the sum of its parts. Devices sharing networked information can leverage external resources to increase their feature set. Networking bottlenecks currently prevent real-time connection at scale, but as 5G becomes more wide-spread, efficiency and usage will increase.

It is the early innings of the IoT revolution, research from Gartner suggests that in 2020 global revenue from connected electronic devices will total $389 billion.[4] Retailers are set to spend an estimated $2.5 billion on hardware like Bluetooth beacons and RFID tags.[5] Soon, IoT will be standard, but in many ways, it already is.

HOW TO ACCESS THIS THEME

The Internet of Things is relevant on its own, but its core technologies are foundational for many other themes.

– Artificial Intelligence (AI) utilities will rely on data gathered by IoT systems and sensors to present real-time insights about the world around them. Think of AI as a system's brains while IoT acts as the digital nervous system.

– Cloud computing seeks to provide the massive processing power required to crunch the unending deluge of data collected from IoT devices. The size and power requirements of sensors need the cloud to organize and process incoming data.

– Robotics depend on IoT sensors to detect needed maintenance and maintain quality control. Robots actively communicating with each other can prioritize tasks independently of human input, adapt to disruptions and facilitate greater levels of automation.

– Autonomous vehicles are expected to use 5G and IoT technology to communicate between independent vehicles and smart roadways to ease traffic and prevent accidents.

All data sourced from Bloomberg.

At the time of publication, three U.S. listed ETFs provide direct exposure to this theme:

– **NXTG** (First Trust Indxx NextG ETF)

– **FIVG** (Defiance Next Gen Connectivity ETF)

– **SNSR** (Global X Internet of Things ETF)

SNSR provides pure-play exposure to IoT. The fund requires companies to generate 50% or more of their revenue from areas within the 5G value chain, including wearable technology, home automation, connected automotive technology, sensors, networking infrastructure/software, and smart metering and energy control devices. Neither NTXG nor FIVG has comparable revenue-based restrictions.[6]

NXTG focuses on getting exposure to 5G through infrastructure and data center REITs and telecommunications service providers. More than a third of NXTG is exposed to telecommunications equipment, mobile telecommunications, and fixed-line telecommunications companies.[7]

As of publication, we prefer SNSR because it has greater exposure to the segments that we feel are likely to benefit from the 5G rollout without having to bear the associated rollout costs. FIVG allocates up to 25% of the fund towards telecom network operators and tower and data center REITs, two segments that we expect to face the brunt of upgrade expenses.

CLOUD COMPUTING

Companies have their heads in the cloud, and for good reason. Cloud computing is one of the most significant recent technological advancements from a business perspective, facilitating access to capabilities that previously required expensive IT infrastructure. The ongoing wave of innovation in enterprise IT changes how companies create products and services and manage their businesses. As data centers continue to scale, the resulting drop in cost is reshaping the business landscape, akin to how electricity once changed the world.[8]

Most recently, COVID-19 and the associated public health response altered the way global business leaders view their workforce and system capabilities. With the workplace shifting into the home office, demand for remote access resources is higher than ever. In a poll conducted by Flexera, 59% of 750 cloud decision-making executives said that their current cloud usage is higher than what they planned pre-pandemic.[9] Synergy Research Group found spending on Q1 cloud infrastructure services increased 37% year over year to $29 billion.[10] The business continuity capabilities cloud technology provides helped to smooth the transition to remote work, particularly as it relates to data security. Bigger picture, cloud technology will define modern workplace adaptability.

According to Fortune Business Insights, the worldwide cloud computing market was valued at $199.01 billion in 2019 and is expected to grow at an 18.6% CAGR to $760.98 billion by 2027.[11] Cloud adoption has gone mainstream, with most new products, services, and business solutions drawing upon the strengths of cloud infrastructure. By 2022, up to 60% of organizations may use a cloud-managed service offering, double the percentage in 2018.[12]

HOW TO ACCESS THIS THEME

Similar to IoT, cloud computing is foundational for many other themes.

At the time of publication, three U.S. listed ETFs provide direct exposure to this theme:

– **SKYY** (First Trust Cloud Computing ETF)

– **CLOU** (Global X Cloud Computing ETF)

– **WCLD** (WisdomTree Cloud Computing ETF)

CLOU requires that its constituents derive 50% or more of their revenue from cloud services, or that they generate more than $500 million in revenue from public cloud activities. Neither of the other options in the space have a similar restriction, diluting true pure-play exposure.[13]

CLOU uses weighting caps to increase diversification. Hyperscale public cloud providers such as Alphabet, Alibaba, Amazon, Microsoft, and IBM are restricted to 2% per security, and 10% in aggregate at each semi-annual rebalance. SKYY caps all holdings at 4.5% max exposure, resulting in hyperscale names comprising roughly 20% of the fund.[14,15]

While CLOU tends to focus on software-as-a-services companies and other pure plays, SKYY includes several legacy hardware and software companies that pivoted to include the cloud but are not cloud natives. Examples are Adobe, HPE, Cisco and SAP, none of which CLOU holds.[16] Additionally, SKYY doesn't provide exposure to data center REITs, the point of interaction between the physical world and the cloud. CLOU caps data REIT exposure at 10%.[17]

WCLD is a new entrant to the space. While its equally weighted construction provides larger exposure to emerging companies, size and liquidity concerns exclude it from consideration at this stage.

ROBOTICS & AI

Don't fear the robots, they are the next step in society's technological evolution. Mankind always looks for ways to ease its work burden. This search prompted humans to make tools, eventually design computers, and integrate the two in the hopes of removing people from the process.

Manufacturing is ripe for robotics and AI disruption. The perfect factory is a self-maintained perpetual system that accepts feedstock and turns out products with limited human oversight or interaction. Technology for this utopia isn't there yet, but the industrial robot market has made great strides in recent years, growing near a 19% CAGR since 2012–13 and expected to continue at this rate through 2021. Since 1990, robot prices have fallen over 50% while labor costs in the U.S. rose 24%.[18] This trend is expected to continue, and it blends well with the deglobalization trend that COVID-19 may spur.

COVID has supply chains under scrutiny. Reshoring production, especially to countries with high labor costs, requires new systems. International Data Corporation's (IDC) 2020 Supply Chain Survey, completed during the early days of the global economic shutdown, showed 72.8% of respondents agreed with the statement that "robotics will be important or very important to their organization within three years."[19] Factories looking to repatriate production while staying price-competitive have few options other than increased robotic adoption.

Outside of manufacturing, robotics can transform lives through medical applications. Ranging from surgical aids to prosthetics, the market for medical robotics, valued at $6.97 billion in 2019, is expected to grow at a 20% CAGR to $25.53 billion by 2025.[20] Advancements in this area may return sight to the blind and hearing to the deaf, among other astounding health outcomes for the human body.

AI will be the brains behind the robot bodies of tomorrow. It's hard to fathom the full potential of AI or machine learning, but if done right, it may be the invention of all inventions. Until that day, AI technology will continue to be used for specific tasks. Expectations for growth remain massive, with the global market expected to grow at a 46.2% CAGR to reach $390.9 billion in 2025.[21]

HOW TO ACCESS THIS THEME

At the time of publication, five U.S. listed ETFs provide direct exposure to this theme:

– **BOTZ** (Global X Robotics & Artificial Intelligence ETF)

– **ROBO** (ROBO Global Robotics & Automation ETF)

– **ARKQ** (ARK Autonomous Technology & Robotics ETF)

– **IRBO** (iShares Robotics and Artificial Intelligence Multisector ETF)

– **ROBT** (SmartETFs Smart Transportation & Technology ETF)

BOTZ offers a targeted approach to robotics and AI companies with around 40 holdings. ROBO is more diversified with around 90 holdings. The companies BOTZ holds derive a significant portion of their revenue or have their primary business line in industrial robotics, drones, non-industrial robotics or AI. These holdings provide the pure-play exposure that we look for when constructing portfolios. Additionally, BOTZ is market cap-weighted, which we prefer because the theme is highly momentum-driven. Conversely, ROBO has a 40% allocation to pure-play and a 60% allocation to non-pure play companies, with an equal weighting scheme used in each bucket.[22]

BOTZ has more industrials and Japan exposure than ROBO, which is mostly due to a market cap weighting scheme that favors the larger Japanese automation firms. The Japanese firms are leaders in the robotics space and benefit from having great commercial relationships with China and the US, the largest robotics consumers in the world. These firms also have strong balance sheets.[23]

ARKQ is an actively managed fund, so it relies on managers to identify companies that are expected to focus on and benefit from greater robotics adoption. This ETF is U.S.-focused and doesn't reflect the overall global robotics market, which has much more exposure to Japanese robotics manufacturers.

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IRBO and ROBT use equal and modified equal weighting schemes, respectively. We have concerns about using equally weighted funds for highly momentum-driven themes like robotics. Each rebalancing results in selling winners and buying losers, effectively resulting in an anti-momentum strategy. Conversely, weighting by market cap allows for increased ownership of successful names while reducing exposure to those that fail their market tests.

ELECTRIC AND AUTONOMOUS VEHICLES

In the push for a greener world, transportation systems are waiting to be disrupted. In 2018, transportation was responsible for 28.2% of all U.S. greenhouse gas emissions, making the industry the largest contributor to total emissions.[24] Light-duty vehicles make up 59% of the industry's annual emissions, while medium and heavy-duty trucks comprise 23%.[25] Progress made in this area could be revolutionary, both environmentally and economically, and it looks to be on the horizon with electric vehicles (EV) now posing a legitimate threat to the cars of yesteryear.

Technological improvements in battery and motor design have improved performance and lowered costs significantly. BloombergNEF estimates that lithium-ion battery prices fell by approximately 90% over the last decade.[26] At one time, batteries were over 50% of an EV's total cost, but today it's about 30%.[27] When price parity is achieved with internal combustion engines, there will be no turning back.

Passenger EV sales totaled 2.1 million globally in 2019 and are expected to be half of all new vehicles sold by 2040.[28] Globally, the industry was valued at $162.3 billion in 2019 and is expected to grow at a 22.6% CAGR to $357.8 billion in 2027.[29]

EVs and AI merging will eventually eliminate human interaction and make the roads safer. According to National Highway Transportation Safety Administration (NHTSA) data, 94% of all automobile-related deaths are linked to human choices and errors.[30] Removing the human element could save tens of thousands of lives a year in the U.S. alone. McKinsey & Company expects adoption of autonomous systems to be gradual but disruptive, with Level 4 autonomy becoming available by 2022 and full Level 5 autonomy to arrive in 2030 at the earliest.[31]

HOW TO ACCESS THIS THEME

At the time of publication, five U.S. listed ETFs provide direct exposure to the electric and autonomous vehicle theme:

- **IDRV** (iShares Self-Driving EV and Tech ETF)
- **DRIV** (Global X Autonomous & Electric Vehicles ETF)
- **KARS** (KraneShares Electric Vehicles and Future Mobility Index ETF)
- **EKAR** (Innovation Shares NextGen Vehicles & Technology ETF)
- **MOTO** (SmartETFs Smart Transportation & Technology ETF)

The theme is still in its early days, and all five of these ETFs remain small with reasonably low liquidity.

DRIV focuses purely on the autonomous and electric vehicle (AV/EV) value chains. It requires all constituents to generate 50% or more revenue from development, production, and sales of AV/EVs, AV/EV vehicle components, and software integral to AV/EV functionality. IDRV also sets revenue requirements for inclusion within its index but has less restrictive requirements than DRIV.[32]

DRIV seeks to maintain a diversified approach to EV manufacturers, electric vehicle components (EVC), and autonomous vehicles technology (AVT) by capping the number of companies in each of the three segments: 15 EV companies, 30 EVC companies (15 materials, 15 components) and 30 AVT companies. DRIV caps the weight of each position at 3%. IDRV doesn't differentiate between segments, capping each security at a 4% weight.[33]

DRIV typically has roughly 15% more exposure to the Information Technology sector than IDRV because it allocates to companies at the forefront of technological advancements in AVs. Conversely, IDRV is roughly 11% more exposed to the Consumer Discretionary sector than DRIV because it seeks to gain greater exposure to traditional auto companies. Historically, traditional automakers lag in AV technologies, instead choosing to partner with tech companies to integrate AV capabilities.[34]

KARS uses a similar screen to DRIV, requiring that all constituents generate 50% or more revenue from EV/AV value chains or a preset group of subindustries. But the underlying index KARS uses is slightly different. As a result, the final portfolios differ, with KARS allocating almost 6% more towards Consumer Discretionary and 7% less to Information Technology than DRIV.[35]

CYBERSECURITY

COVID forced people indoors, away from their workplaces and, for many, into home offices. To connect with coworkers, people moved from the water cooler to various video chat platforms like Zoom. Unfortunately, many companies experienced the darker side of remote work first-hand, noticing that weak security facilitated so-called "Zoom-bombing" attacks, where third parties joined calls to display explicit photo or video content. These hijinks are relatively harmless, but they're just the tip of the data insecurity iceberg. Data from McAfee research shows that the work-from-home environment triggered a 630% increase in attacks on cloud-based services and software like Microsoft Office 365.[36]

Perhaps the most concerning trend is the rise of government-sponsored hacking attempts. In May alone, Chinese hackers were accused of accessing the EasyJet travel records of over 9 million customers, conducting a phishing campaign against Vietnamese government officials, trying to steal U.S. coronavirus vaccine research, and multiple public and private sector cyberattacks on Taiwan.[37,38] A report co-written by the U.S. Cybersecurity and Infrastructure Security Agency says the increase in state actor activity during COVID is "consistent with longstanding priorities such as espionage and 'hack-and-leak' operations."[39]

Companies recognize the threats to their businesses and are expected to spend $12.6 billion in cloud-based security tools by 2023, more than double the $5.6 billion spent in 2018. Currently, the global cybersecurity market is worth $173 billion and expected to grow to $270 billion by 2026. Corporate in-house cybersecurity functions are projected to grow at 7.2% annually over that same period, while external products and services are expected to grow at 8.4%.[40]

HOW TO ACCESS THIS THEME

At the time of publication, four U.S. listed ETFs provide direct exposure to the cybersecurity theme:

- **CIBR** (First Trust NASDAQ Cybersecurity ETF)
- **HACK** (ETFMG Prime Cyber Security ETF)
- **IHAK** (iShares Cybersecurity and Tech ETF)
- **BUG** (Global X Cybersecurity ETF)

BIOTECH AND GENOMICS

Never before has the investing public focused so intently on innovation in biotech. COVID-19 has genetics, life sciences, and pharmaceutical companies zeroed in on developing and repurposing solutions to get us through this public health crisis.

COVID-19 is a huge opportunity for the global vaccine market. In 2018, this was already a $41.6 billion industry projected to grow at a 10.7% CAGR from 2019–2026 – that was before the crisis that infected over 10 million globally as of this writing.[41,42] Public sector support via funding and relaxed regulations has helped the vaccine development process. A number of candidates are on track for Phase 3 trials, where vaccines are tested on patients for safety and efficacy.[43] But when every second counts, the physical limitations of the real world can slow research. Not surprisingly, the answer is to go digital.

AI and robotic systems are primed to propel biotech. Already, pharmaceutical companies use supercomputers, machine learning, and AI tools to screen potential therapies before creating assays for physical lab testing. Machine learning models trained on COVID-19 data can simulate interactions between therapies, human cells, and the virus, reducing testing time by months.[44] Estimates put the market for AI healthcare integration at $4.9 billion currently and $45.2 billion by 2026 following a 44.9% CAGR.[45]

On the genomics front, it's increasingly seen as a superweapon against the constant onslaught of pathogens on the human body. Understanding the source code of organisms opens new doors to help scientists create drugs and treatments. Leading Chinese firm BGI Group says it can now sequence an entire genome for under $100, a precipitous drop from $50,000 only a decade ago.[46] BGI Group leans heavily on robotic benchwork, which not only removes human-induced variables, but also eases test replication to confirm results.

The genomics space is expected to become a $31.1 billion global industry by 2027, growing at a 7.7% CAGR.[47] While still a relatively small market, genomics is likely to accelerate as it goes mainstream.

HOW TO ACCESS THIS THEME

The biotech theme can be accessed through multiple ETFs, including:

- **IBB** (iShares NASDAQ Biotechnology ETF)
- **XBI** (SPDR S&P Biotech ETF)

XBI provides broad-based, equal-weighted access to the biotech sub-sector. We believe that a weighting scheme that shifts exposure down the cap ladder and focuses on small, fast-growing companies is an advantage in the space.

The genomics theme can be accessed through the following ETFs:

- **ARKG** (ARK Genomic Revolution ETF)
- **PBE** (Invesco Dynamic Biotechnology & Genome ETF)
- **GNOM** (Global X Genomic & Biotechnology ETF)
- **GDNA** (Goldman Sachs Human Evolution ETF)
- **HELX** (Franklin Genomic Discovery ETF)

We see the roadmap for genomics and have high hopes for the theme, but genomics isn't far enough into the Early Adaptors phase yet for positioning. Instead, we prefer to gain more diverse exposure via biotech.

FINTECH

Technology has permeated all things, even cash. Tech continues to extend its reach into the financial industry, rapidly changing how people spend, lend, borrow, and invest. Legacy business models that do not adapt will be left in the dust as the financial sector moves into its digital future.

For American consumers, the current payment paradigm is comfortable. Credit cards are a convenient enough solution. But there are headaches on the merchant side of the transaction, including processing fees and the back-end payment network. Here is where mobile payment technology shines, resulting in faster and more secure transactions, less fraud, and lower fees. As of 2018, 71% of merchants supported mobile payments, with a further 21% planning to add mobile payment technology in the future.[48] Increasingly commonplace, Americans are starting to lean more on the added conveniences of mobile payments, evidenced by the market increasing 41% year over year to $98.9 billion in 2019.[49]

Fintech solutions are particularly popular in emerging market countries, which use these technologies to leapfrog legacy financial systems and bring financial services to previously unbanked and underserved populations. A clear example of this trend is China, where a mobile payment revolution has occurred. Instead of adopting credit cards that require vast infrastructure, China bypassed plastic and jumped right to mobile payments. China now has the highest adoption rate globally, with 83% of all transactions in 2018 completed with mobile payment technology, versus just 4% in 2012.[50]

Elsewhere, robo-advisors and other smart investing platforms are changing the way everyday people interact with Wall Street. For investors who don't yet need a full-service financial advisor, algorithms can provide base-level advice. Focusing on low fees and diversification, robos use risk tolerance questionnaires to help investors design their asset allocations. Interest is rising, with the robo space expected to grow at a 21% CAGR till 2023.[51]

HOW TO ACCESS THIS THEME

At the time of publication, three U.S. listed ETFs provide direct exposure to the fintech theme, while a number of other products focus on subsections such as mobile payments and blockchain technologies. We believe targeting pure-play exposure via a generalist view of the space is desirable.

- **FINX** (Global X Fintech ETF)
- **ARKF** (ARK Fintech Innovation ETF)
- **GFIN** (Goldman Sachs Motif Finance Reimagined ETF)

FINX seeks passive pure-play exposure to fintech's growth. To be included in the index, companies must have significant revenue exposure or conduct primary business operations in one or more of the following sub-themes: mobile payments, peer to peer and marketplace lending, enterprise solutions, blockchain and alternative currencies, crowdfunding, and personal finance/automated wealth management/trading software.

ARKF is an actively managed fund and therefore relies on managers to identify companies that are expected to focus on and benefit from increasing fintech adoption. ARKF does not necessarily provide pure-play exposure to the theme and currently has a high level of exposure to large, well-known Internet companies. This exposure currently comprises about 40% of the ETF.[52]

We removed GFIN from consideration due to size and liquidity concerns.

MILLENNIALS

Move over Mom and Dad, it's a Millennial world now. No longer cash-strapped, Millennials are a powerful, disruptive group that consumes. Born between 1980 and 2000, the oldest Millennials turn 40 this year, while the youngest turn 20. Seventy-two million strong, Millennials are now the largest generation in the U.S. in terms of labor force participation at 79%, according to pre-COVID data.[53,54] To note, this participation rate may hide the prevalence of more temporary gig economy or hospitality jobs. So, job losses tied to COVID-related shutdowns affected the 25–34-year-old demographic more than others. Unemployment for this group increased 9.1% between February and May.[55]

But Millennials are undoubtedly a force. By 2025, they will comprise three-quarters of the global workforce.[56] Although burdened by more debt than any previous age group, Millennials are set to become the richest generation of all time. Millennials are expected to receive a stunning $68 trillion in value by 2030 as part of the greatest generational wealth transfer in history. While inheritances can be hard to quantify, by 2030 the average Millennial will likely control five times the wealth they do today.[57] Many Millennials are off to a good start: currently, there are approximately 618,000 millionaire Millennials, or about 2% of total American upper class and 0.2% of the total population.

Millennial preferences differ from prior generations, in that they focus on technology, seek experiences, and prioritize health and wellness. Millennials are concerned more with access to resources than, say, home or car ownership, for example. Millennials are comfortable delaying such major purchase and using a slew of tech-based services and rental markets to access what they need instead.

As Millennials enter prime working age, form households, and increase their purchasing power, companies and industries that are best positioned to capitalize on this secular growth opportunity should be a focus.[58]

HOW TO ACCESS THIS THEME

At the time of publication, two U.S. listed ETFs provide direct exposure to the Millennial theme:

- **MILN** (Global X Millennials Thematic ETF)
- **GENY** (Principal Millennials ETF)

We removed GENY from consideration for our portfolios due to size and liquidity concerns.

SOCIAL MEDIA

The public square has gone digital, and now everyone has a soapbox. Social media platforms revolutionized the way that the world communicates, consumes news and media, and shares ideas.

Originally a space for free expression and communication, social media platforms are now a marketing paradise. According to Zenith forecasts, 2019 was the first year in which social media ad spend outpaced print advertising, growing over 20% to $84 billion. Social advertising now accounts for 13% of total budgets and is ranked as the third most popular channel, after TV ads and paid search.[59]

In the age of Big Data, proprietary user information is an important asset for social media companies and figures to become more influential as analytics expand. Marketers regularly use this information for ad targeting, ensuring that their dollars make as much of an impression as possible. By 2020, 1.7 megabits of data per second are expected to be produced per person. In total, the aggregate data volume is estimated to reach 44 trillion gigabytes by the end of 2020, and to double every two years thereafter.[60,61]

Social media as a theme is approaching the Early Majority phase. It continues to mature, helped by virtual monopolies customized for sharing information. Users post photos to Instagram, videos to YouTube, thoughts to Twitter, and pretty much everything to Facebook. Innovation will persist, but at a slower pace than the golden years of the early 2010s. When considering staging, an important distinction to make is between adoption by end users and marketers. Marketers—and their budgets—continue to flood social media as monetization opportunities grow. Conversely, user growth is well below peak growth rates.

But daily active users on a robust platform like Facebook haven't decreased, continuing to grow at a near consistent 10% rate since the end of 2017. Instead,

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user demographics have shifted.[62] User growth on Facebook is older now, with users aged 65 and older increasing from 26% market penetration in 2018 to 37% in 2019.[63] Use of the platform remained stable among Millennials and declined slightly for Gen X from 76% to 74%.[10]

As laggards continue to join mature platforms, the younger generation has set out to establish their own space. One such space primed to benefit from this shift is TikTok. The newest face on the social media scene fills the void left by Vine, supporting video content in quick bites. The Chinese company saw American user growth skyrocket in 2019, increasing 97.5% to over 37.2 million users.[64]

HOW TO ACCESS THIS THEME

SOCL (Global X Social Media ETF) provides pure-play exposure to social media. It is the only fund of its kind in the investment universe.

VIDEO GAMES & ESPORTS

Video games are no longer seen as a nerdy pastime. Mass adoption gives the concept of "gamer" credence, even as a profession. And in the age of lockdown, video games take on an even bigger role as safe forms of entertainment and social contact, helping people stay connected while physically apart.

According to trade group Entertainment Software Association, 65% of American adults, or more than 164 million people, now play video games. In 2018, sales totaled more than $43.4 billion.[65] Sales reached a record $1.5 billion for the month of April amid stay-at-home orders and are expected to grow at a 12% CAGR from 2020–2025.[66,67]

Catalysts for increased growth look to be plentiful in the coming months, tied to recent advancements in graphics and upcoming hardware releases. Recently released next-generation graphics added ray tracing capabilities to video games, making the digital world more dynamic and realistic. Ray tracing is the headline addition to new consoles that Microsoft and Sony plan to release for the holiday season later this year. Expectations for the kickoff of this hardware super cycle are high. PS5 sales are expected to eclipse 6 million units by March 2021.[68]

Cloud computing power and advanced networking capabilities continue to develop the remote gaming segment. Instead of plugging into a console or gaming computer, cloud gaming platforms stream visual output to end users while running games remotely in a data center. Input latency remains a hurdle, but remote processing power lets gamers who haven't upgraded to the newest hardware play blockbuster titles at high visual fidelity. Rising hardware costs may drive more users to the space, which was valued at $306 million in 2019 and is expected to grow at a 59% CAGR to 3.1 billion in 2024.[69]

A growing giant in the video game world is Esports. Small-scale competitions first appeared in America during the 1970s, but in the 2000s tournaments started to become more visible internationally, with South Korea leading the charge. Today, Esports is a vast global industry expected to surpass $1 billion in revenue in 2020.[70] Total viewership is expected to grow at a 9% CAGR from 2019–2023, increasing the opportunities of game developers and marketers to cash in on a growing and passionate fan base.[71]

Streaming is another way that viewers can consume video game-related content. Led by online platform Twitch, streaming is popular with Generation Z. Professional streamers combine action-packed content with complicated tactics and entertaining commentary to create scenarios perfect for product integration. Viewers come to experience the personalities of their favorite streamers, whether or not gameplay is at a professional level. Currently, livestreaming is growing roughly 100% year-over-year. Twitch is a big part of that growth, recording over 1,491 billion hours of gaming content watched between April 2019 and April 2020, versus 750 million hours in the prior year.[72]

HOW TO ACCESS THIS THEME

At the time of publication, four U.S. listed ETFs provide direct exposure to the video game and Esports theme:

- **ESPO** (VanEck Vectors Video Gaming and eSports ETF)
- **HERO** (Global X Video Games & Esports ETF)
- **GAMR** (ETFMG Video Game Tech ETF)
- **NERD** (Roundhill Esports & Digital Innovation ETF)

The video game space is surprisingly diverse, making pure-play exposure especially important. HERO ensures pure-play positioning by requiring all companies to derive at least 50% of their revenues from developing and publishing video games, streaming and distributing gaming content, owning and operating esports leagues, or producing video game hardware. This requirement promotes a higher level of pure-play exposure than competitor ESPO, the underlying index of which permits continued inclusion of companies where gaming-related revenues fall up to 25% below their 50% revenue threshold for new constituents. GAMR has no such restriction.[73]

Global X Research believes that holding between 30 and 40 names accurately targets pure-play video game and Esports exposure. Considering the breadth of the gaming ecosystem, targeting fewer names, like ESPO's 25, can mean weak exposure to important segments, such as streaming.[74]

ESPO's third largest holding, Tencent (7.25%), generates revenue from activities outside of gaming[75] While Tencent's gaming-related revenues are significant in absolute terms, the company's outside activities make it less representative of the gaming industry. Given its significant weight in the fund, Tencent actually dilutes exposure to the theme.[76]

GAMR seeks exposure outside of pure-play companies, adding names that provide intellectual property related to the gaming industry and exposure to gaming conglomerate companies whose business models are supportive of the industry. These names include Apple, Alphabet, and others that are not directly or fully exposed to the gaming and Esports theme.[77]

NERD is a new entrant in the space. Its modified equal weighing construction provides larger exposure to emerging companies, but size and liquidity concerns exclude the fund from consideration.

E-COMMERCE

It turns out that a pandemic can change shopping habits. Early in the COVID-19 crisis, retail shops faced quickly diminishing stocks of key goods. Daily shipments kept the largest locations somewhat full, but rising demand stressed most supply chains. Once forced to lockdown, consumers ventured online en masse to meet their shopping needs, as evidenced by a 49% jump in month over month e-commerce sales in April, led by the online grocery category.[78]

Interestingly, groceries have been one of the most resistant purchase types to make the digital transition. In general, people have a personal relationship with their food, and while younger generations are comfortable using subscription meal boxes, many Boomers prefer in-person shopping. According to the Food Industry Association (FMI), 61% of Millennials shop for consumer package goods online, versus just 41% of Baby Boomers.[79] But these are pre-COVID numbers, and shoppers have been forced to change their habits. According to recent survey data, 41% of shoppers purchasing groceries online for pick up or delivery were found to be buying groceries online for the first time.[80]

E-commerce sales made up 11.8% of total U.S. retail sales in Q1 of 2020, more than doubling the 4.2% seen in Q1 2010.[81] Now with COVID's influence, e-commerce's share is expected to reach 14.5% by the end of this year.[82] And behavioral changes are expected to persist after the COVID crisis is resolved, with more consumers buying online across more categories.

HOW TO ACCESS THIS THEME

At the time of publication, four U.S. listed ETFs provide direct exposure to the e-commerce theme:

- **IBUY** (Amplify Online Retail ETF)
- **ONLN** (ProShares Online Retail ETF)
- **EBIZ** (Global X E-commerce ETF)
- **BUYZ** (Franklin Disruptive Commerce ETF)

OVERLAP BETWEEN THEMES

The table below looks at the overlap in holdings (by weight) between different ETFs. Most of the themes have minimal to no overlap. When considering ETFs for inclusion into the portfolios, understanding the level of overlap is extremely important.

OVERLAP IN HOLDINGS (BY WEIGHT)

Source: ETF Research Center, as of 6/19/20.

	SNSR	CLOU	BOTZ	XBI	MILN	CIBR	CHIQ	SOCL	FINX	EBIZ	DRIV	BUG	HERO	LIT	AIQ	GNOM
SNSR	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CLOU	0%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOTZ	2%	0%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
XBI	0%	0%	0%	100%	-	-	-	-	-	-	-	-	-	-	-	-
MILN	0%	6%	0%	0%	100%	-	-	-	-	-	-	-	-	-	-	-
CIBR	2%	14%	0%	0%	0%	100%	-	-	-	-	-	-	-	-	-	-
CHIQ	0%	1%	0%	0%	0%	0%	100%	-	-	-	-	-	-	-	-	-
SOCL	0%	1%	0%	0%	17%	0%	0%	100%	-	-	-	-	-	-	-	-
FINX	0%	4%	0%	0%	12%	0%	0%	0%	100%	-	-	-	-	-	-	-
EBIZ	0%	7%	0%	0%	13%	0%	16%	5%	1%	100%	-	-	-	-	-	-
DRIV	12%	3%	5%	0%	6%	3%	1%	5%	0%	0%	100%	-	-	-	-	-
BUG	0%	14%	0%	0%	0%	49%	0%	0%	0%	0%	0%	100%	-	-	-	-
HERO	0%	0%	7%	0%	4%	0%	0%	15%	0%	4%	5%	0%	100%	-	-	-
LIT	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	11%	0%	0%	100%	-	-
AIQ	8%	18%	4%	0%	17%	5%	8%	13%	1%	12%	27%	2%	4%	0%	100%	-
GNOM	0%	0%	0%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Cumulative Overlap	24%	68%	18%	26%	75%	73%	28%	56%	18%	58%	78%	65%	39%	13%	119%	26%
Cumulative Overlap (Thematic Disruptors)	4%	26%	2%	0%	35%	16%	1%	18%	16%	-	-	-	-	-	-	-
Cumulative Overlap (Digital Innovation)	14%	29%	14%	-	-	-	-	26%	5%	17%	30%	14%	31%	-	-	-

CONCLUSION

The only constant in life is change. Human history has never seen such a period of consistent, widespread technological disruption like today. We are on the cusp of revolutionary advances like driverless cars, gene therapies and advanced robotics, among many others. The world of tomorrow remains just out of reach in many respects, but thanks to thematics, investing in the future has never been more accessible. Commonalities between themes can be stark or more subtle. But connecting the dots between themes has meaningful implications for portfolio construction, particularly when seeking to capture societal change driven by disruptive tech. Just remember, change is constant, and we are here to capture that move forward.

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