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The Cost of Underestimating Technological Disruption

Investors are underestimating the rapid pace of technological disruption and its impact on companies across industries. While virtually all investment strategies today focus on identifying thriving companies, *not* owning those left behind by technological change presents investors with a potentially compelling opportunity to generate alpha.

GraniteShares XOUT U.S. Large Cap ETF (XOUT) is an exchange traded fund whose objective is to track the performance of the XOUT US Large Cap Index (the Index) before fees and expenses.

The Index seeks to capitalize on technological disruption by eliminating companies in its investable universe that are unable to adapt and thrive in an evolving technological and economic landscape.

The speed and magnitude of technological disruption is relevant because current and future technologies will continue to create winners (i.e., *the disruptors*) and losers (i.e., *the disruptees*) among all companies across industries faster than the market may realize.

However, owning a broad market index exposes investors to both winners and losers. While it makes sense to invest in today's leading companies, why own those managing technological disruption inadequately?

This paper aims to explore:

- Disruptive technology and innovation
- Industries permanently impacted by accelerating technological change and COVID-19: Communications, Ecommerce and Transportation
- How exclusion works by avoiding the disruptees, providing a potential source of alpha without additional risk

Disruptive Technology and Innovation

Disruptive technology affects the way a market or industry functions. In some cases, the business models that adapt to new technologies generate new markets and values. This

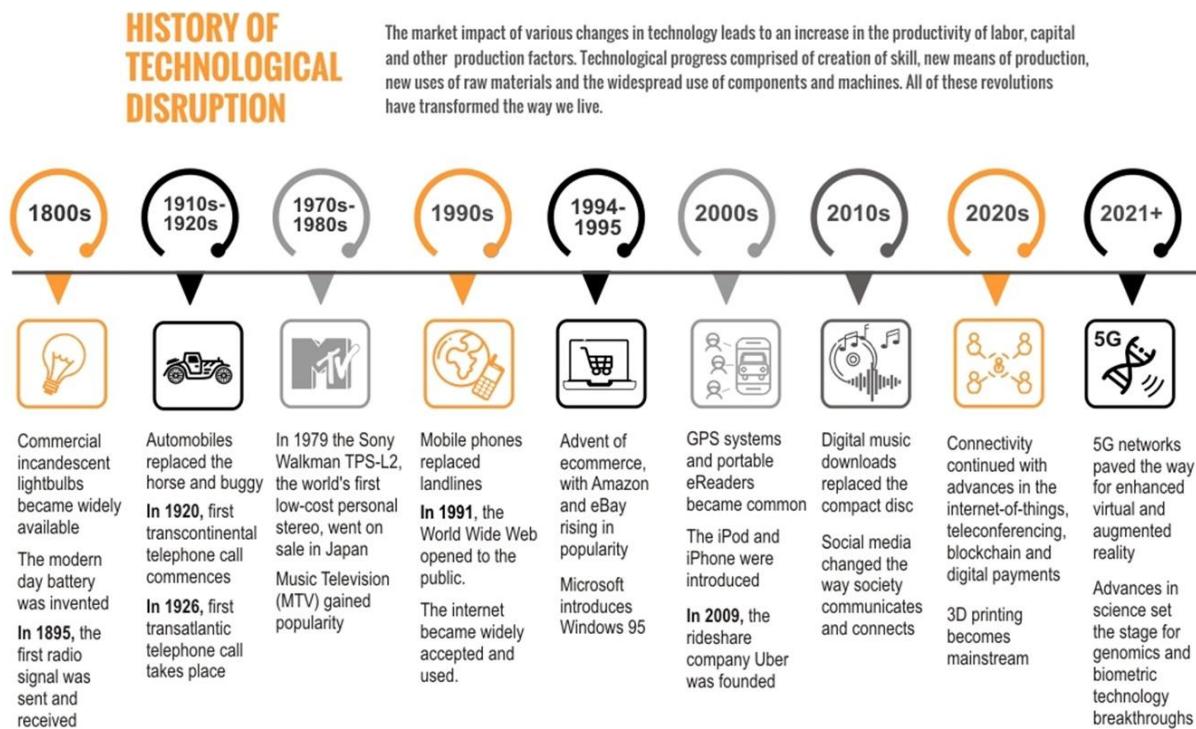
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leads to the disruption of well-established companies.¹

Disruptive innovation happens when technology transforms expensive or highly sophisticated products or services — previously accessible to a high-end or more-skilled segment of consumers — to become affordable and accessible to a broader population. This transformation disrupts the market by displacing long-standing, established competitors. Amazon is a prime example of disruptive innovation when it launched its online bookstore in the mid-1990s.²

New technologies have typically upended the status quo, forcing companies to reevaluate and adjust their businesses, with many examples throughout history:³



Following the onset of COVID-19 and through today, emerging technologies, including some of the examples below, have yet again changed the way we do things. The acceleration of these emerging technologies clearly came on faster than the marketplace was able to recognize. As technology became more widely used (or accepted) a reset of security prices ensued, making 2020 and 2021 impressive years for the disruptors. Looking ahead to the next decade and

¹ Source: Florida Institute of Technology, "Disruptive Technology Definitions and Examples" retrieved 8/20/2021 <https://www.floridatechonline.com/blog/information-technology/disruptive-technology-definition-and-examples/>

² Source: Investopedia.com "Disruptive Innovation," Aug. 23, 2021, <https://www.investopedia.com/terms/d/disruptive-innovation.asp>

³ Sources: Simplilearn.com "What Is Digital Disruption and the Top Five Digital Disruptors to Watch Out for in 2021" <https://www.simplilearn.com/digital-disruption-article> April 30, 2021; Investopedia.com "Disruptive Innovation," Aug. 23, 2021, <https://www.investopedia.com/terms/d/disruptive-innovation.asp>



beyond, these new technologies may become even more ubiquitous.⁴

- **Zoom** – This videoconferencing software application has enabled workers to conduct virtual meetings outside the traditional office.
- **5G** – Fifth generation technology is the standard for broadband cellular networks with greater bandwidth and higher download speeds than 4G, allowing internet access for laptops and desktop computers.
- **Electric and Driverless Cars** – In 2020, more than 10 million electric cars were on the world's roads, with battery electric models driving the expansion, according to the International Energy Agency (IEA). In its Global EV Outlook 2021, the IEA states that more than 20 countries have announced the full phase-out of internal combustion engine car sales over the next 10 to 30 years. Driverless cars are not expected to gain wide public acceptance until issues of safety and cyber security are addressed. Nonetheless, many companies, including automakers, technology giants and specialist start-ups, have invested approximately \$50 billion over the past five years to develop autonomous vehicle technology, with 70% of the money coming from outside the automotive industry, according to a *Yahoo! Finance* article.
- **Drones** – The drone services market size is expected to grow from \$4.4 billion in 2018 to \$63.6 billion by 2025, according to a *Business Insider* article, with consumer drone shipments forecast to reach 29 million by the end of 2021. Over the past few years, businesses and government organizations have used unmanned aircrafts for deliveries and to scan unreachable military bases.
- **Satellite Communications** – The satellite communications market was valued at \$65.68 billion in 2020 and is projected to grow by 9% to \$131.68 billion by 2028. This growth is expected to result from increased demand for various applications, such as wireless mobile communications, aircraft connectivity and air traffic management.⁵

If past is prologue in the world of technology disruption, the broad market has arguably not fully priced in the dynamics brought on by the accelerating rate of change and the innovations mentioned above, other than driving up the prices of a few hyped-up meme stocks (e.g., AMC and

⁴ Sources: Wikipedia: Zoom - <https://en.wikipedia.org/wiki/Zoom>; 5G <https://en.wikipedia.org/wiki/5G> retrieved 9/3/2021; Electric and Driverless Cars - International Energy Agency "Trends and developments in electric vehicle markets" Global EV Outlook 2021 <https://www.iea.org/reports/global-ev-outlook-2021/trends-and-developments-in-electric-vehicle-markets>, "Policies to promote electric vehicle deployment" <https://www.iea.org/reports/global-ev-outlook-2021/policies-to-promote-electric-vehicle-deployment>; Yahoo! Finance "Autonomous/Driverless Car Market – Growth, Trends, COVID-19 Impact, and Forecast (2021-2026)" July 1, 2021 https://finance.yahoo.com/news/autonomous-driverless-car-market-growth-145300015.html?fr=syccrp_catchall; Drones - Future of Drones: Business Insider "Applications & Uses of Drone Technology in 2021" January 12, 2021 <https://www.businessinsider.com/drone-technology-uses-applications>

⁵ Source: Handbook of Satellite Applications "Trends and Future of Satellite Communications" retrieved Sept. 7, 2021, https://link.springer.com/referenceworkentry/10.1007/978-1-4419-7671-0_24



GameStop).⁶

XOUT's thesis is that by eliminating the disruptees, which are slow or unable to adapt to technological change, the winners will take care of themselves, and alpha will be generated.

Market Impact of Technological Disruption

The market impact of technological disruption can be gleaned from the change in leadership within the S&P 500 Index. Exhibit 1 shows the current dominance of new technology stocks, such as Apple, Amazon, Facebook, and Google [Alphabet Inc.], based on factors such as index weights, market capitalization and revenue, as of July 31, 2021.

Exhibit 2 shows the revenue drop among previous decades' S&P 500 Index leaders, such as General Electric, Xerox, DISH Network and Yum! Brands, in the three years through 2020.⁷

It is important to note that investing in an index⁸, such as the S&P 500 Index means owning companies that have capitalization weightings that allow them to be in the index, but may have significantly underperformed, such as those shown in Exhibit 2, column 6 (year-to-date % stock change). Excluding these underperformers in an investment portfolio can improve the potential to generate alpha.⁹

Exhibit 1

The S&P 500 Index Leaders (as of July 31, 2021)

Company	Index Weighting	Market Cap (\$ Billions)	Revenue (\$ Billions, 4-Quarter Trailing)	Net Income (\$ Billions, 4-Quarter Trailing)	Place Change from Last Month
Apple Inc.	6.2%	\$2,288.0	\$347.2	\$86.8	None
Microsoft Corp.	5.8%	\$2,145.8	\$168.1	\$61.3	None
Amazon.com, Inc.	3.8%	\$1,426.5	\$443.3	\$29.4	None
Facebook, Inc.	2.3%	\$853.7	\$104.8	\$39.0	None
Alphabet, Inc. Class A	2.2%	\$810.4	\$220.3	\$62.9	None
Alphabet, Inc. Class C	2.1%	\$770.1	\$220.3	\$62.9	None
Tesla, Inc.	1.4%	\$529.6	\$41.9	\$2.2	Up Two
Berkshire Hathaway, Inc.	1.4%	\$527.5	\$365.2	\$105.8	Down One

XOUT's thesis is that by eliminating the disruptees, which are slow or unable to adapt to technological change, the winners will take care of themselves, and alpha will be generated.

⁶ Source: Nasdaq, "Unusual Options Activity Might Reveal the GameStop (GME) and AMC-led Meme Rally Will Continue Today" August 25, 2021 <https://www.nasdaq.com/articles/unusual-options-activity-might-reveal-the-gamestop-gme-and-amc-led-meme-rally-will>

⁷ Sources: Investopedia.com "Top 10 S&P 500 Stocks by Index Weight," Aug. 14, 2021 <https://www.investopedia.com/top-10-s-and-p-500-stocks-by-index-weight-4843111>; Investors' Business Daily, "GE Isn't The Only Big Company That Keeps Shrinking" May 28, 2020 <https://www.investors.com/etfs-and-funds/sectors/sp500/ge-isnt-only-big-company-keeps-shrinking/>

⁸ Indexes are not managed; one cannot invest directly in an index.

⁹ Source: Investopedia.com, "Disruptive Innovation," Aug. 23, 2021, <https://www.investopedia.com/terms/d/disruptive-innovation.asp>



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Nvidia Corp.	1.3%	\$485.9	\$19.3	\$45.3	New in Top 10
JPMorgan Chase & Co.	1.2%	\$459.5	\$121.1	\$47.8	Down 2 Places

Source: Investopedia.com, S&P Dow Jones Indices <https://www.investopedia.com/top-10-s-and-p-500-stocks-by-index-weight-4843111>

Exhibit 2

Shrinking S&P 500 Companies

Revenue dropped in each of the past three years and is seen tumbling in 2020, too.

Company	Ticker	2019 Revenue (\$ Millions)	2020 Revenue Est. (\$ Millions)	3-year Cumulative Revenue % Change	YTD % Stock Ch.	Sector	Composite Rating
SL Green Realty	(SLG)	\$1,211.2	\$859.0	-32.0%	-52.1%	Real Estate	37
General Electric	(GE)	\$95,214.0	\$79,368.8	-20.3%	-34.7%	Industrials	17
Xerox	(XRX)	\$9,066.0	\$7,346.4	-15.8%	-50.9%	Information Technology	16
DISH Network	(DISH)	\$12,807.7	\$12,368.8	-15.8%	-12.4%	Communication Services	55
YUM! Brands	(YUM)	\$5,366.7	\$5,366.7	-11.9%	-10.4%	Consumer Discretionary	65
S&P 500					-6.0%		

Source: IBD, S&P Global Market Intelligence

It is clear that owning only the “winners” as identified by the best performers in the U.S. large-cap index, such as the S&P 500, could generate alpha. However, investing in the disruptors can be complicated and extremely challenging, especially on a consistent basis. It requires an investor to focus on how companies will adapt to disruptive technology and make selective security selections. For example, in the last two decades, companies that have heavily focused on the internet as a disruptive technology have continued to prosper. In contrast, companies failing to integrate the internet’s disruptive innovation into their business models have been pushed aside.¹⁰

Over the last two decades, technology stocks in the S&P 500 Index have often outpaced the broad index, as shown in Exhibit 3. The technology sector’s outperformance has been most pronounced in the last five years, as new technologies in cloud computing and artificial intelligence (AI) enabled new digital applications in the COVID-19 era.¹¹

¹⁰ Source: Investopedia.com, “Disruptive Innovation,” Aug. 23, 2021, <https://www.investopedia.com/terms/d/disruptive-innovation.asp>

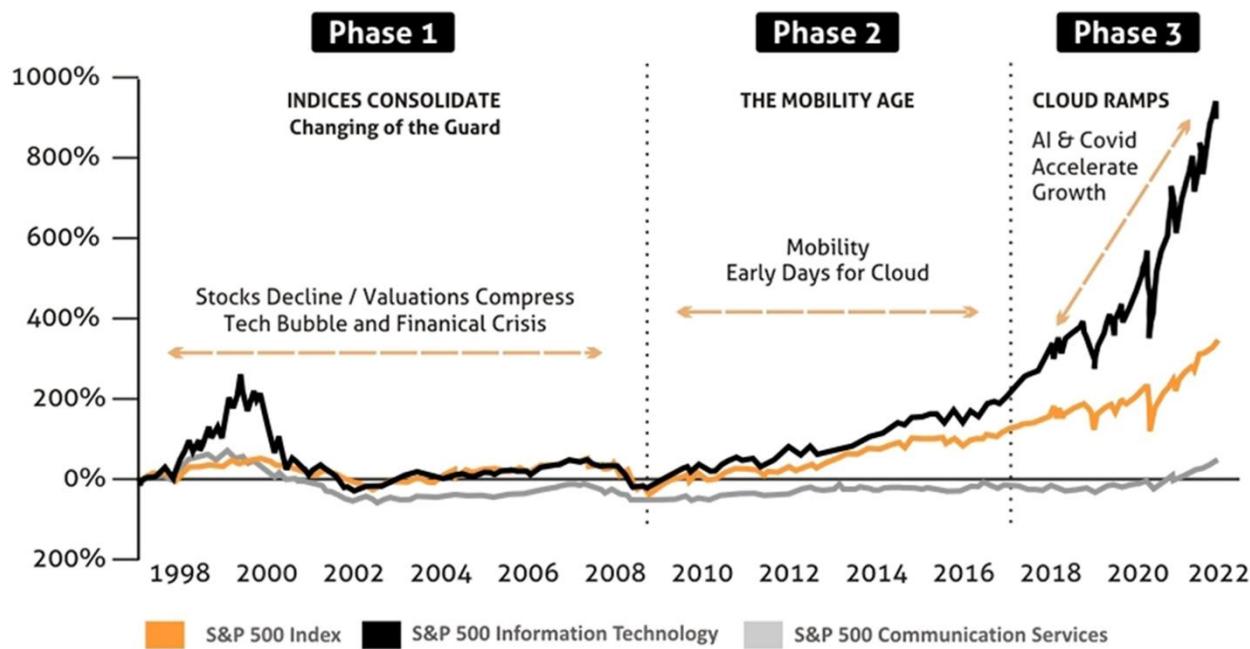
¹¹ Source: CFRA, S&P Global Market Intelligence, https://go.cfraresearch.com/StockMarket_Tech



Exhibit 3

HISTORICAL RESULTS

The S&P 500 Index is generally considered as the best single measure of U.S. large-cap equities, representing companies from 11 sectors within the U.S. economy. While sector performance has fluctuated with changing market cycles, the technology sector has outperformed the broad index over the long term.



Source: CFRA, S&P Global Market Intelligence, https://go.cfrastructure.com/StockMarket_Tech

Exclusionary vs. Passive Investing

Furthermore, it is important to note that investing in an index, such as the S&P 500 Index means owning companies that have capitalization weightings that allow them to be in the index, but may have significantly underperformed, such as those shown in Exhibit 2, column 6 (year-to-date % stock change). Excluding these underperformers in an investment portfolio can improve the potential to generate alpha.¹²

Exhibit 4 illustrates the changing leadership among the top 10 companies in the S&P 500 Index from 2012 through March 31, 2021.

¹² Source: Investopedia.com, "Disruptive Innovation," Aug. 23, 2021, <https://www.investopedia.com/terms/d/disruptive-innovation.asp>



Exhibit 4

A Decade of Capturing Changing Leadership

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Apple	Apple	Apple	Apple	Apple	Apple	Microsoft	Apple	Applet	Apple
Exxon	Exxon	Google	Google	Google	Google	Apple	Mircroft	Microsoft	Microsoft
GE	Google	Microsoft	Microsoft	Microsoft	Microsoft	Amazon	Google	Amazon	Amazon
Microsoft	GE	Exxon	Berkshire Hathaway	Berkshire Hathaway	Amazon	Google	Amazon	Google	Google
Chevron	J&J	Berkshire Hathaway	Exxon	Exxon	Facebook	Berkshire Hathaway	Facebook	Facebook	Facebook
J&J	P&G	J&J	Amazon	Amazon	Berkshire Hathaway	Facebook	Berkshire Hathaway	Berkshire Hathaway	Tesla
P&G	Chevron	Wells Fargo	Facebook	Facebook	J&J	P&J	JPM	P&G	Berkshire Hathaway
IBM	JPM	GE	GE	J&J	JPM	JPM	Visa	J&J	JPM
AT&T	Wells Fargo	Facebook	J&J	JPM	Exxon	Visa	J&J	Walmart	Visa
Pfizer	Microsoft	Walmart	Wells Fargo	GE	B of A	Exxon	Walmart	JPM	J&J

Established Leader
New Leader

Source: XOUT Capital; as of 3/31/2021

Industries permanently impacted by COVID-19: Communications, Ecommerce and Transportation

The relevance of technological disruption has been evident during the COVID-19 pandemic, when the internet and mobile phones became critical tools for surviving lockdowns and quarantines worldwide — keeping societies functioning by helping people shop for groceries, work, and stay in touch with family and friends without leaving home. A survey by consulting firm McKinsey & Company has found that responses to COVID-19 have speeded the adoption of digital technologies by several years — and that many of these changes could be here for the long haul.¹³

Life-saving technologies — such as those in communications (connectivity online), ecommerce (online shopping/digital transactions) and transportation (e-hailing and ridesharing) — will thrive beyond the pandemic.¹⁴

¹³ Source: McKinsey & Company, "How COVID-19 has pushed companies over the technology tipping point — and transformed business forever" Oct. 5, 2020, McKinsey Global Survey of Executives <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

¹⁴ Source: World Economic Forum "10 technology trends to watch in the COVID-19 pandemic," April 27, 2020 <https://www.weforum.org/agenda/2020/04/10-technology-trends-coronavirus-covid19-pandemic-robotics-telehealth/>



Communications

The internet is a classic example of disruptive technological innovation, forever changing the way we communicate, work, shop and conduct digital transactions. According to an article by the Florida Institute of Technology, when people used the web for the first time, few predicted it would change the core of how we live.¹⁵

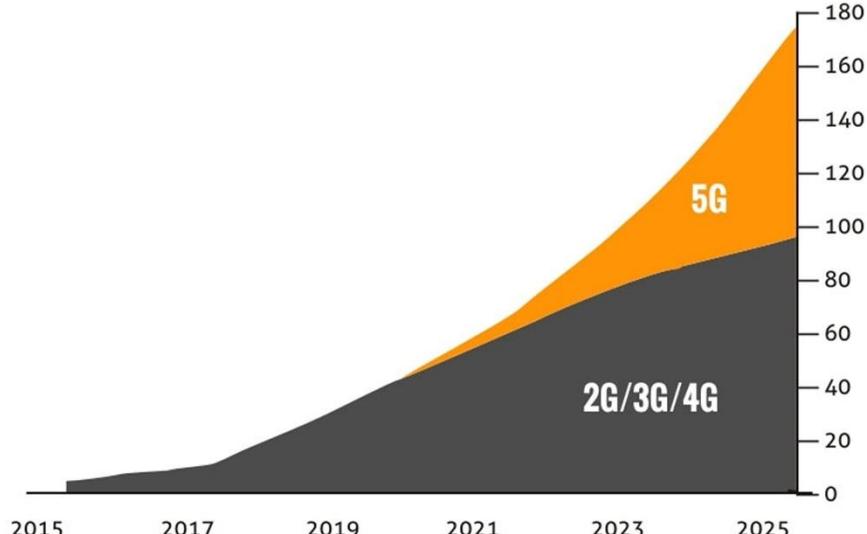
According to a report by the U.S. Federal Communications Commission, online communications have been especially important during the pandemic as remote work, distance education and telemedicine have become the new normal. This new era of digitalization spans industries amid growing demand for connected devices, increased processing power and wider network coverages, factors driving the growth of the communications sector.¹⁶

Another example of disruptive technology is the fifth generation (5G) of wireless cellular communications. The biggest promise of 5G for consumers is that it will have media transfer and data transaction speeds comparable to wired Ethernet networks across the country, and at boosted speeds in areas where the topology and service infrastructure support the necessary technology, according to a ZDNet article.¹⁷

Until now, mobile broadband has been the key driver for wireless technology deployment.

However, today's smartphones and tablets—dominated by the iOS and Android ecosystems combined with sophisticated cloud-based services—provide a stable, well-defined application environment that allows developers to target billions of users, according to a report by 5G Americas, a wireless industry trade association. The chart to the right shows an Ericsson data projection from 2015 to 2025.¹⁸

Global Mobile Data Traffic (Exabytes/Month) 2015 to 2025



Source: 5G Americas, Rysavy Research "Global 5G: Rise of a transformational technology", September 2020

¹⁵ Source: Floridatechonline.com "Disruptive Technology Definitions and Examples," retrieved 8/20/2021 <https://www.floridatechonline.com/blog/information-technology/disruptive-technology-definition-and-examples/>

¹⁶ Source: Federal Communications Commission, "Report and Recommendations: COVID-19 Response, Disaster Response and Recovery Group" presented to the Broadband Deployment Advisory Committee of the Federal Communications Commission Oct. 29, 2020 <https://www.fcc.gov/sites/default/files/bdac-disaster-response-recovery-approved-rec-10292020.pdf>

¹⁷ Source: Zdnet.com, "What is 5G? Your guide to the current generation of wireless communications," April 27, 2021 <https://www.zdnet.com/article/what-is-5g-the-business-guide-to-next-generation-wireless-technology/>

¹⁸ Source: 5G Americas, Rysavy Research "Global 5G: Rise of a transformational technology," September 2020 <https://www.5gamericas.org/global-5g-rise-of-a-transformational-technology/>

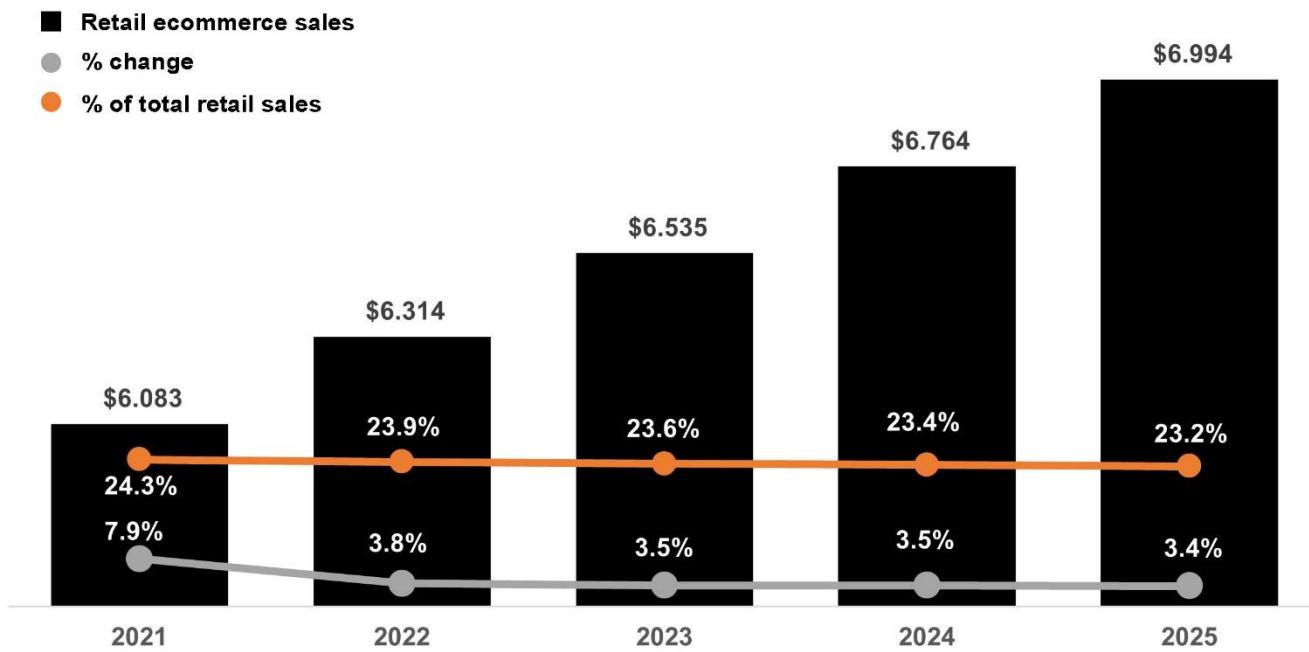


Ecommerce

Ecommerce is a relatively recent disruptive technology that originated from the internet. Nearly every product and service have become available through ecommerce transactions, from music to plane tickets, to stock investing and online banking. The rise of ecommerce has meant some traditional, brick-and-mortar retail businesses have taken a back seat amid a fast-evolving technological and economic landscape, especially during the pandemic.

In the United States, consumers are forecast to spend \$933.30 billion on ecommerce in 2021, up 17.9% year over year, and equaling 15.3% of total U.S. retail sales, according to an eMarketer report. Brick-and-mortar retail spending is expected to grow 6.3% to \$5.149 trillion in 2021. The accelerated shift toward online channels is projected to continue beyond the pandemic, as shown in the chart below.¹⁹

Retail Ecommerce Sales in the US, 2019-2025 *trillions, % change, and % of total retail sales*



Note: 2019-2025 CAGR=18.4%; includes products or services ordered using the internet regardless of the method of the payment or fulfillment; excludes travel and event tickets, payments such as bill pay, taxes, or money transfers, food services and drinking place sales, gambling, and other vice goods sales.

Source: eMarketer, May 2021. Compound Annual Growth Rate (CAGR): The rate of return required for an investment to grow from its beginning to ending balance

¹⁹ Source: eMarketer, "US Ecommerce Forecast 2021" July 8, 2021, <https://www.emarketer.com/content/us-e-commerce-forecast-2021>

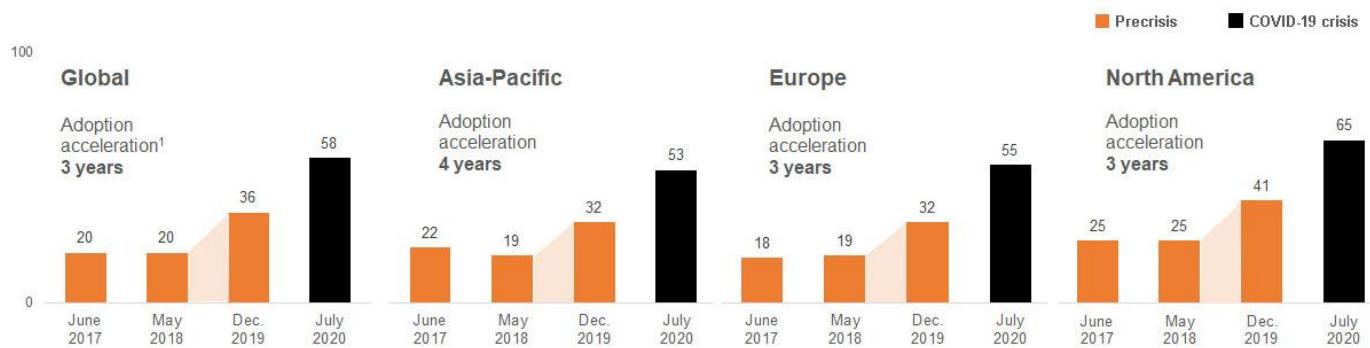


Increasing Digital Transactions

Digital adoption has taken a quantum leap at both the organizational and industry levels. According to a McKinsey & Company Global Survey of executives, their companies have accelerated the digitization of their customer and supply-chain interactions and of internal operations by three to four years. During the pandemic, consumers have moved toward online channels, as companies and industries have responded in turn. The survey results stated that rates of digital adoption were years ahead of where they were when previous surveys were conducted, as shown in the chart below. Respondents were three times likelier now than before the crisis to say that at least 80% of their customer interactions were digital in nature.²⁰

The COVID-19 crisis has accelerated the digitization of customer interactions by several years.

Average share of customer interaction that are digital, %



¹Years ahead of the average rate of adoption from 2017 to 2019.

Source: McKinsey & Company

Coming Soon: Quantum Computing Disruption

The development of technologies related to quantum computing is forecast to further accelerate digital transactions and other applications that address some of our greatest global challenges, ranging from information sharing and new drug development to designing new materials for more efficient carbon capture plants and batteries, as well as keeping water clean with chemical sensors.²¹

The development of technologies related to quantum computing is forecast to further accelerate digital transactions and other applications that address some of our greatest global challenges

²⁰ Source: McKinsey & Company, "How COVID-19 has pushed companies over the technology tipping point — and transformed business forever" Oct. 5, 2020, McKinsey Global Survey of Executives <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

²¹ Sources: Scientific American, "Quantum Computing May Be Closer Than You Think," Sept. 1, 2020 <https://www.scientificamerican.com/article/quantum-computing-may-be-closer-than-you-think/>



Quantum computing focuses on developing computer technology based on the principles of quantum theory (which explains the behavior of energy and material on the atomic and subatomic levels). Computers used today can only encode information in bits that take the value of 1 or 0 — restricting their ability. Quantum computing, on the other hand, uses quantum bits or qubits. It harnesses the unique ability of subatomic particles that allow them to exist in more than one state (i.e., a 1 and a 0 at the same time). Quantum computing is much more powerful than classical computing and can be used for big data analysis or simulations.²²

While there's no commercially developed quantum computer to date, fully functional quantum computers and a new quantum industry may come much sooner than many have anticipated, according to an article in Scientific American. In January 2020, the U.S. Department of Energy announced the establishment of five new National Quantum Information Science Research centers, the latest development in the National Quantum Initiative Act, signed into law in December 2018 and comes with a \$625 million funding over five years.²³

On the corporate side, 40% of large companies are expected to create initiatives around quantum computing, according to the research firm Gartner, as reported in *The Wall Street Journal*. Alphabet Inc.'s Google plans to spend several billions of dollars to build a quantum computer by 2029 that can perform large-scale business and scientific calculations without errors.²⁴

The global market for quantum-computing hardware is forecast to exceed \$7.1 billion by 2026, according to Research and Markets, a research firm.²⁵

Transportation

The shared mobility market, which includes e-hailing and ridesharing, is another example of disruptive technology that has changed modern transportation as we know it. While the industry has been impacted by the COVID-19 pandemic, demand has remained robust. According to a McKinsey report, more than 40 million e-hailing trips are being booked on the two biggest U.S. platforms daily. Globally, the e-hailing market has accounted for more than 90% of consumer spending in shared mobility.²⁶

²² Investopedia "What Is Quantum Computing" <https://www.investopedia.com/terms/q/quantum-computing.asp>

²² Sources: Investopedia "What Is Quantum Computing" <https://www.investopedia.com/terms/q/quantum-computing.asp>

²³ Sources: Scientific American, "Quantum Computing May Be Closer Than You Think," Sept. 1, 2020 <https://www.scientificamerican.com/article/quantum-computing-may-be-closer-than-you-think/>; U.S. Department of Energy, "Department of Energy Announces \$625 Million for New Quantum Centers," January 10, 2020 <https://www.energy.gov/articles/department-energy-announces-625-million-new-quantum-centers>

²⁴ Source: The Wall Street Journal, "Google Aims for Commercial-Grade Quantum Computer by 2029," May 18, 2021 <https://www.wsj.com/articles/google-aims-for-commercial-grade-quantum-computer-by-2029-11621359156>

²⁵ Source: The Wall Street Journal, "Google Aims for Commercial-Grade Quantum Computer by 2029," May 18, 2021 <https://www.wsj.com/articles/google-aims-for-commercial-grade-quantum-computer-by-2029-11621359156>

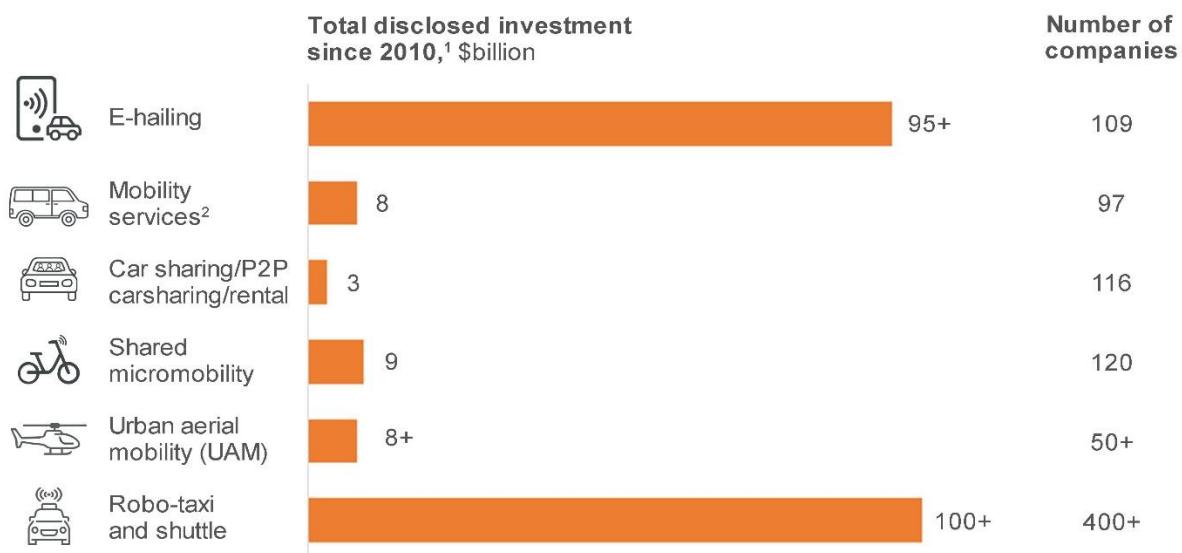
²⁶ Sources: McKinsey & Company, "Shared mobility: Where it stands, where it's headed," Aug. 11, 2021 <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/shared-mobility-where-it-stands-where-its-headed>; Msn.com, "The Future of rideshare services after COVID-19" Aug. 21, 2020 <https://www.msn.com/en-us/money/personalfinance/the-future-of-rideshare-services-after-covid-19/ar-BB18dq3r>



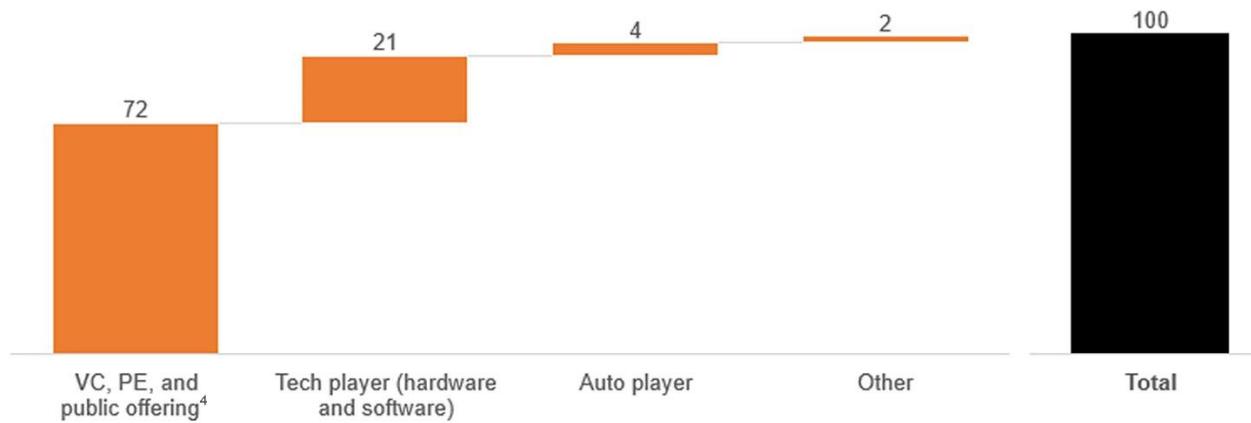
McKinsey reports that since 2010, more than \$100 billion has been invested in shared mobility companies, as shown in the chart below.

More than \$100 billion has been invested in nonautonomous shared-mobility companies, mainly by venture capital and private-equity players.

Investments in shared-mobility companies since 2010¹



Total disclosed investment amount since 2010 by investor type, percent of total³



¹As of June 2021.

²Includes ride-pooling, mobility-as-a-service players, etc.

³Figures may not sum to 100%, because of rounding.

⁴Venture capital; private equity

Source: Capital IQ; McKinsey Center for Future Mobility; McKinsey Growth Analytics – Horizon Scan; PitchBook



This massive investment is driven by expectations that people's dependence on transportation technology will continue to grow given the ease and convenience of shared mobility.

According to a Nasdaq report, global digitalization created a springboard for smartphone-incepted ridesharing applications. Furthermore, the report states that autonomous driving is the future of the ridesharing space, and once this is viable, the value of the digital ride space will skyrocket.²⁷

Exclusion Works: Avoiding Technology Laggards May Provide Alpha with No Additional Risk

Given the fast-evolving technological arena, it may be difficult to fully understand — let alone forecast — how technological disruption will affect businesses across industries.

While many active investment management approaches focus on identifying winners in the technology space and other market sectors, the majority of domestic U.S. equity funds generally trailed their benchmarks over short- and long-term periods, according to the S&P Dow Jones Indices SPIVA® U.S. Scorecard report for yearend 2020. Particularly notable is that 94% of active U.S. large-cap equity managers underperformed the S&P 500 Index in the last 20 years on an annualized basis.²⁸

Particularly notable is that 94% of active U.S. large-cap equity managers underperformed the S&P 500 Index in the last 20 years on an annualized basis.

XOUT, we believe offers a better approach to navigate the impact of technological disruption across industries — by simply not owning the disruptees in a market index. This approach takes the guesswork out of identifying winners and losers, with the potential to generate alpha.

XOUT utilizes rules-based, quantitative measures to eliminate the companies within a market index that appear to be disadvantaged or disrupted in the current market environment. We recognize that many of those companies may ultimately adapt to change, retool themselves and once again reemerge as industry leaders, so their exclusion is not permanent. The index components are re-evaluated and rebalanced on a quarterly basis.

²⁷ Nasdaq "Ridesharing in the New Normal," Nov. 11, 2020, <https://www.nasdaq.com/articles/ridesharing-in-the-new-normal-2020-11-11>

²⁸ Source: S&P Dow Jones Indices SPIVA® U.S. Scorecard Year-End 2020 <https://www.spglobal.com/spdji/en/documents/spiva/spiva-us-year-end-2020.pdf>



The quantitative factors informing the XOUT proprietary growth model include a combination of fundamental growth signals designed to unearth industry and/or secular disruption, such as:

- **Weak revenue growth** (companies failing to grow their sales)
- **Lack of employee growth** (companies that are not hiring or growing their workforce)
- **Failure to deploy capital** (companies not reinvesting in research and development)
- **Inability to repurchase company shares** (companies not investing in themselves and supporting shareholder value)
- **Negative earnings sentiment** (companies consistently disappointing investors)
- **Lackluster management performance** (companies failing to address technological change)
- **Poor profitability** (companies without pricing power and have shrinking margins)

Conclusion

Time and again, technological disruption and innovation have created winners and losers. XOUT offers an alternative to traditional active and passive investment approaches by focusing on what companies **NOT** to own — and simply “X” them “OUT” — amid a constantly shifting investment landscape.



DEFINITIONS

Alpha - A measure of performance based on the excess return of an investment relative to the return of a benchmark index.

Android – A mobile operating system designed for touchscreen mobile devices, such as smartphones and tablets, created and developed by the Open Handset Alliance consortium of developers and commercially sponsored by Google,

Artificial Intelligence – Intelligence demonstrated by machines and any system that perceives its environment and takes actions that maximize its chance of achieving its goals.

Cloud Computing – The on-demand availability of computer system resources, especially data storage and computing power, without the user's direct active management.

Disruptive Innovation - in business theory, a disruptive innovation is an innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market-leading firms, products, and alliances.

Exponential – an increase becoming more and more rapid.

Global Positioning System (GPS) – A satellite-based radionavigation system owned by the U.S. government, providing geolocation and time information to a GPS receiver anywhere on or near Earth.

Internet of Things – Physical objects that are embedded with sensors, processing ability, software, and other technologies, and which connect and exchange data with other devices and systems over the internet or other communications networks.

iOS – A mobile operating system, created and developed by Apple, Inc., that powers many of the company's mobile devices.

Mobility – Includes technologies and services that enable people and goods to move around more freely.

Source: <https://blogs.microsoft.com/chicago/2016/04/12/defining-mobility-for-the-automotive-industry/>

S&P 500® - An index that includes 500 leading companies and covers approximately 80% of available market capitalization in the United States.

S&P 500® Information Technology – An index that comprises those companies included in the S&P 500 that are classified as members of the GICS® information technology sector.

The S&P 500® Communication Services – An index that comprises those companies included in the S&P 500 that are classified as members of the GICS® communication services sector.

Top Ten Fund Holdings (as of 7/15/21). Subject to change.

1	APPLE INC	9.41%
2	MICROSOFT CORP	8.12%
3	AMAZON.COM INC	7.25%
4	ALPHABET INC-CL A	6.66%
5	FACEBOOK INC-CLASS A	3.88%
6	VISA INC-CLASS A	2.05%
7	NVIDIA CORP	1.97%
8	JOHNSON & JOHNSON	1.74%
9	WALMART INC	1.52%
10	UNITEDHEALTH GROUP INC	1.51%



XOUT CAPITAL

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ABOUT US

XOUT

XOUT Capital® (“XOUT”), founded by David Barse, is an index company specializing in identifying which companies not to own or “XOUT” in an index. XOUT’s first index, the XOUT U.S. Large Cap Index (ticker: XOUTTR), evaluates the 500 largest U.S. companies and determines how each company is addressing the challenges of technological disruption. While most investors focus on the disruptors, XOUT focuses on eliminating the disruptees.

For information, please visit www.xoutcapital.com

GRANITESHARES

GraniteShares is an ETF investment firm focused on providing investors with innovative, cutting edge investment solutions. We believe the future of investing lies at the nexus of alternative thinking, low fees and disruptive product structures—the core of our high conviction philosophy. Backed by Bain Capital Ventures, we launched our first product in 2017 and are now among the fastest growing ETP issuers with over \$1.6 Billion in assets under management spanning a full array of investment strategies.

For more information, please visit www.graniteshares.com



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IMPORTANT DISCLOSURES

This material must be preceded or accompanied by a prospectus

<https://www.graniteshares.com/media/leppb432/graniteshares-etftrust-prospectus-2020.pdf>. Carefully consider the Fund's investment objectives risk factors, charges and expenses before investing. Please read the prospectus before investing.

The GraniteShares XOUT U.S. Large Cap ETF (the "Fund") seeks to provide investment results that, before fees and expenses, correspond generally to the total return performance of the XOUT U.S. Large Cap Index (the "Index").

The Fund is distributed by ALPS Distributors, Inc, which is not affiliated with GraniteShares or any of its affiliate

The XOUT U.S. Large Cap Index utilizes a proprietary, quantitative methodology developed by XOUT Capital, LLC designed to identify companies that have a risk of being disrupted and as a result could underperform their relevant sector. The companies identified are then excluded from the index selection. The Fund is passively managed and attempts to mirror the composition and performance of the Index. The Fund's returns may diverge from that of the Index due to costs and expenses incurred by the Fund or its holdings may deviate from a precise correlation with the Index. The Index uses proprietary methodology to exclude certain securities and there can be no assurance this will result in positive performance. The Fund may concentrate its investments to the same extent as the index and it may be exposed to the risk of loss from adverse developments facing those industries. One cannot directly invest in an index

PRINCIPAL RISKS OF INVESTING IN THE FUND

The Fund is passively managed and attempts to mirror the composition and performance of the Index. The Fund's returns may diverge from that of the Index due to costs and expenses incurred by the Fund or its holdings may deviate from a precise correlation with the Index. The Index uses proprietary methodology to exclude certain securities and there can be no assurance this will result in positive performance. The Fund may concentrate its investments to the same extent as the index and it may be exposed to the risk of loss from adverse developments facing those industries.

You could lose money by investing in the Fund. There can be no assurance that the investment objective of the Fund will be achieved. The Funds should be relied upon as a complete investment program. The investment program of the fund is speculative, entails substantial risks and include asset classes and investment techniques not employed by more traditional mutual funds. Investments in the ETFs are not bank deposits and are not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency.

This information is not an offer to sell or a solicitation of an offer to buy shares of any Funds to any person in any jurisdiction in which an offer, solicitation, purchase or sale would be unlawful under the securities laws of such jurisdiction.