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AlphaCurrents

The Four Seasons of Cryptocurrency

Last March, we published a report in which we looked at two explanations of the cryptocurrency cycle, warned of the danger of a “crypto winter” and suggested some ways to rebalance away from crypto. Today the mood couldn’t be any different. A drumbeat of stories about fortunes lost, bankruptcies and outright fraud, along with the overhang of regulatory clampdowns, has not led to new lows. Instead of questioning whether the bull might resume, this has led investors to wonder whether the bear market is over. Those who successfully avoided the crypto hype are bragging as much as their more bullish counterparts were in late 2021 and early 2022. In retrospect, the crypto winter of 2021-2022—when bitcoin troughed 77% below its all-time high—looks a lot like the 2014-2015 and 2017-2018 cycles when bitcoin troughed nearly 84% below its former high. Further, several signs suggest the most recent winter may already be over. If winter is over, what might a “crypto spring” look like?

This *AlphaCurrents* likens the four-year crypto cycle to the seasons of the year. While indicators suggest spring is here, spring is not great—with most crypto returns occurring after the halving in “crypto summer” or “crypto fall.” However, spring is an ideal time to get educated on cryptocurrency ahead of the more positive portions of the cycle.

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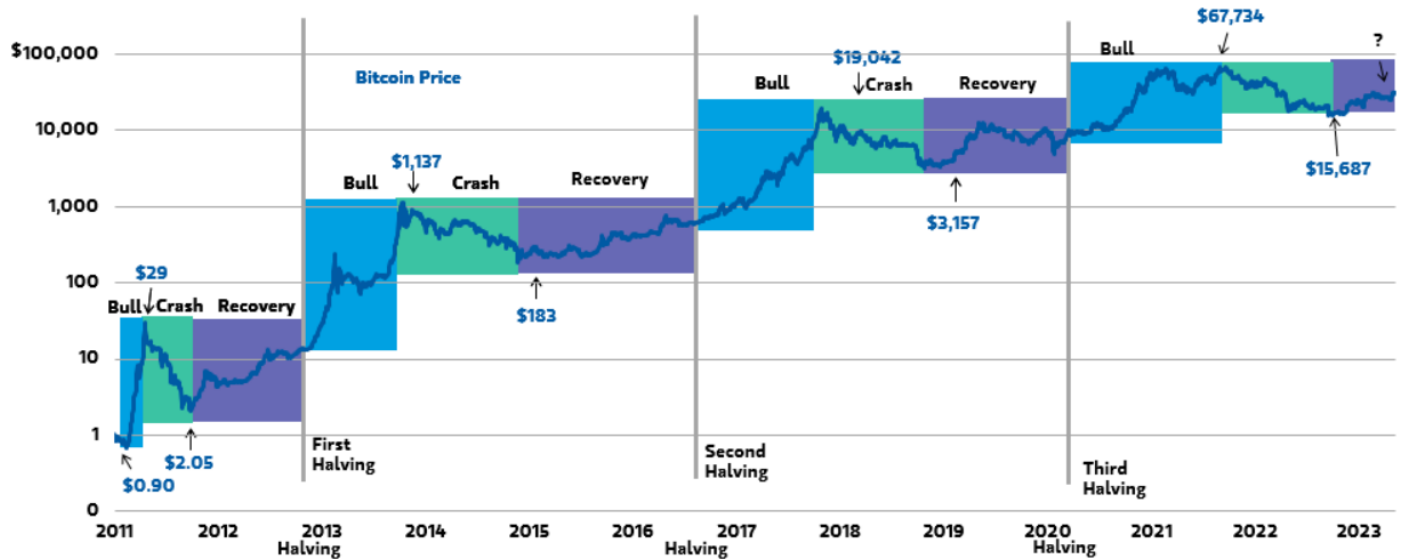
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For additional information about the risks of cryptocurrencies, please see the Important Information in the Disclosure section of this report.

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Exhibit 1: The Bitcoin Halving Cycle



Source: Bloomberg, Morgan Stanley Wealth Management Global Investment Office as of July 18, 2023

Bitcoin has not made a new low in nine months and some believe bitcoin's price bottomed last November. If the crypto winter of 2021-2022 is over, perhaps crypto spring, the next season of the four-year bitcoin cycle, is upon us. We look at the two prior crypto cycles for commonalities that could repeat in the current halving cycle from 2020 to 2024. Even if crypto spring has arrived, it's too early to position for the next summer, which might not come. The prior two instances of spring (the period in the cycle from the price trough to the halving) featured positive average monthly returns—much better than the negative returns of winter. However, those two examples also suggest investor apathy reigns, and regulatory uncertainty dominates the news. Additionally, average monthly returns were the lowest of the three positive seasons.

This time, a recession or regulation/enforcement could easily make this crypto spring more negative than in past cycles. Notably, in crypto spring, there are no flashy announcements of adoption. Beneath the surface, however, the roots of a summer bloom may be forming. We do not recommend buying or selling bitcoin, but to keep it on the radar while staying informed and waiting for the halving next year.

Bitcoin Halving Cycle

Many people still do not know about the bitcoin halving cycle, even as the start of the fourth cycle approaches. Every four years, the number of bitcoins created every ten minutes—as a result of a block of transactions being approved—is cut in half. This creates a planned supply shortage. Historically, the three times halvings have occurred, they have kicked off 12- to 18-month bull runs. These bull runs were followed by three 12- to 14-month declines similar in magnitude to that of US equities during the Great Depression.

These periods have been commonly dubbed crypto winters. Investors are typically skeptical of projections regarding economic cycles, as they are inherently unpredictable. Yet, it is not nearly so controversial to predict that summer temperatures will be hotter than winter temperatures, even if it's hard to forecast the hottest day or precisely when winter will end and spring will begin. If crypto cycles are more like seasons than economic cycles, it might be useful to review the weather of past seasons. In our April 2021 primer, "Investing in Cryptocurrency," we broke the cycle into bull, crash and recovery phases, as shown in Exhibit 1. While these phases stand out in hindsight, it is difficult to identify turning points in real time.

Exhibit 2: Summer Has Historically Resulted in the Highest Bitcoin Returns

Crypto Season	Season Description	Average Duration (Months)	Average Monthly Return (%)			
			2012 Cycle	2016 Cycle	2020 Cycle	All Cycles
Spring	Period between the trough and halving	14	6.6	8.0	9.5	7.5
Summer	Period between the halving and when the prior peak is regained	5	40.7	10.2	14.0	17.3
Fall	Period between when the prior peak is regained and the new peak	10	81.6	31.5	12.2	38.6
Winter	Period between the new peak and the trough	13	-9.1	-8.0	-7.9	-8.4

Note: 2020 cycle includes the current spring. This cycle is not complete yet. We measure bitcoin cycles starting at the halving. Summer is the first season, starting the month following the halving and including the month bitcoin reaches the prior peak. Fall starts the month following bitcoin reaching the prior peak and includes the month bitcoin makes a new peak. Winter starts the month following a new bitcoin peak and includes the trough in price. Spring begins the month following the trough in bitcoin price and includes the next halving.

Source: Bloomberg, Morgan Stanley Wealth Management Global Investment Office as of June 30, 2023

The Four Seasons of Cryptocurrency

As bitcoin is the largest cryptocurrency, we'll use it as a proxy for the entire asset class. Historically, most of bitcoin's gains have come in the period directly after the halving, which we dub summer. Summer includes the period from the halving to the prior all-time high, a time when hype is building (see Exhibit 2). In this period, the bitcoin shortage, caused by a sudden decline in bitcoin production, has historically led to a bull market in most cryptocurrencies. The next season, fall, is the time from the old high to the new high. The price momentum of the spring and summer has in the past brought in new investors, captured the imagination of the media and led to many new corporate adoption headlines. However, it also attracts scammers and frauds. This has historically been the time to sell and harvest gains. The winter (peak to trough) is the inevitable bear market, instances of which have been similar in magnitude of price decline to that of US equities during the Great Depression. All the vaporware, fraud, and scammers become more apparent, and regulators get more involved. After the bottom, spring is here until the next halving. A lot happens beneath the surface, but it doesn't make the headlines or cocktail party conversation. We discuss the signs of spring and describe the spring weather below.

How Do We Know When Crypto Spring Starts?

In the past, farmers used all kinds of methods to decide when to plant crops. In addition to calendars, some used soil temperature, soil humidity and animal behavior patterns—such as whether a certain groundhog could see its shadow—to help predict whether spring had arrived. These signs suggested the coldest days were past, the spring thaw had begun and farmers could plan for the planting season. Cryptocurrency “farmers” have their own set of signs, even if many of them are backward-looking.

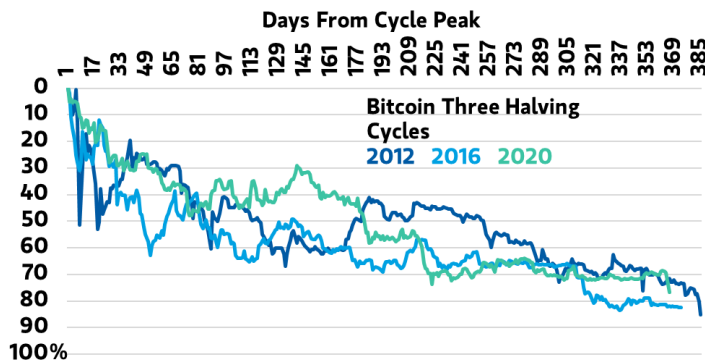
Signs of Crypto Spring

Calendar. Bitcoin troughs have occurred twelve (2016-2020 cycle) to fourteen (2012-2016 cycle) months after the peak. The most recent trough in November 2022 occurred twelve months after the 2021 peak.

Drawdown. Bitcoin troughs have occurred at levels approximately 84% (2015) and 83% (2018) below the prior highs (see Exhibit 3). In 2023, the trough was 77% below the high. The return from the halving to the peak was lower than that of prior cycles, so it makes sense the decline was also less than those of prior cycles.

Trough in Bitcoin Difficulty. "Difficulty" is a variable used by the bitcoin protocol to help keep the rate of production stable throughout a cycle. When difficulty increases, it becomes harder to mine bitcoin; when it declines, it becomes easier. Most of the time difficulty rises, but sometimes, such as when too many miners are quitting and leaving the network, it drops in order to encourage miners to stick around. Some investors look for these miner capitulations as a signal that winter is over and the bottom is in. Difficulty tends to trough near the bottom of the cycle. In December 2014, difficulty troughed 2% below its prior high and a few weeks before the price bottom. In December 2018, difficulty fell 31% from its high and troughed just after bitcoin's price bottomed and winter ended. In January 2023, difficulty fell 8%, reaching its low almost two months after the price bottom (see Exhibit 4). For more on bitcoin difficulty, see our Aug. 3, 2022 report, "[Is Bitcoin Difficulty a Useful Indicator?](#)"

Exhibit 3: The Latest Crypto Winter Saw a Smaller Drawdown Than in the Three Previous Cycles



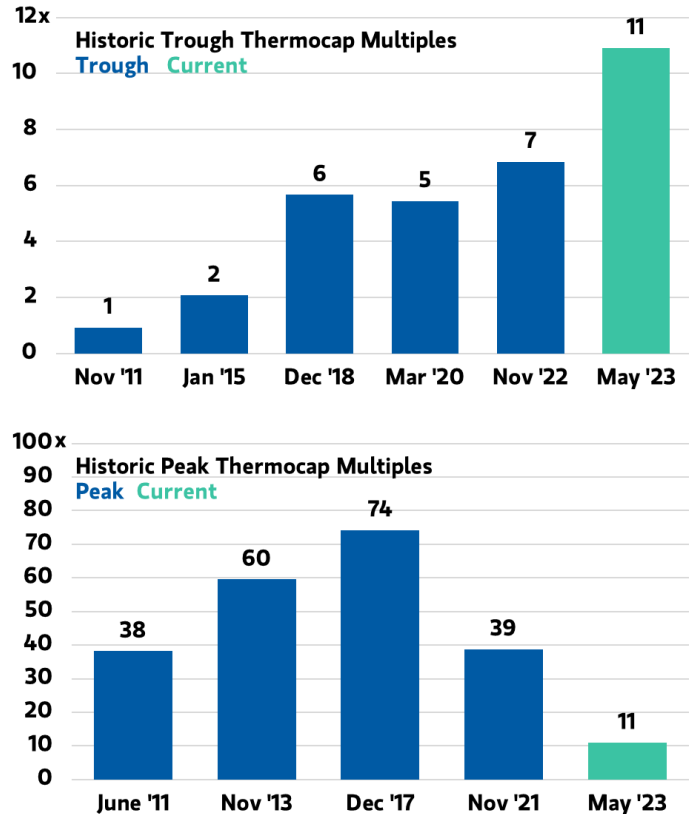
Source: Bloomberg, Morgan Stanley Wealth Management Global Investment Office as of May 31, 2023

Exhibit 4: Initial Increases in Difficulty Have Historically Indicated Price Bottoms



Source: Bloomberg, BTC.com, Morgan Stanley Wealth Management Global Investment Office as of May 31, 2023

Exhibit 5: Bitcoin's Thermocap Multiple Has Ranged From 1-7x to 38-60x



Source: Glassnode, Morgan Stanley Wealth Management Global Investment Office as of May 31, 2023

Bitcoin Price-to-Thermocap Multiple. Bitcoin "thermocap" captures how much money has been invested in bitcoin since its inception. Thermocap is calculated by summing the number of bitcoins that have been mined each day and multiplying that by each day's market price. Traditionally it is either interpreted as an approximation of amount of money spent on energy to run the bitcoin network or the amount spent securing the network. The concept is also similar to that of the book value of a bank, which measures how much money has been put into a bank through share sales and retained profits.

As such, comparing the market capitalization of bitcoin to the thermocap is like calculating the price-to-book ratio of a bank. To take the analogy a step further, when a bank stock trades near or below book value, investors fear that it may not survive. When it trades at a low price-to-book multiple, investors fear that the bank will accumulate less money in the future (through retained profits). When the bank trades at a high price-to-book ratio, it suggests investors believe it will keep adding earnings to its book value at a rapid pace. Bitcoin's current thermocap is roughly \$48 billion, according to Glassnode. As displayed in Exhibit 5, it trades at roughly 11

times thermocap value today, up from 7x in November 2022. Previous trading troughs occurred at 2x in 2015, 6x in 2018 and 5x in 2020. Peaks occurred between 38x and 74x. In the past, bitcoin's price bottomed at thermocap multiples in the 2-6 range. This cycle's trough was higher than that of prior cycles but within 20% of the 2018 low.

Problems at Exchanges. Near price bottoms, there have often been issues with cryptocurrency exchanges. In January 2015, the exchange Bitstamp announced a hack of 19,000 bitcoins worth \$5 million, and the Mt. Gox bankruptcy of March 2014 is still working its way through the legal system. In December 2018, the founder of Canada's largest cryptocurrency exchange died mysteriously and the exchange declared bankruptcy the following April. In November 2022, a news article questioning the solvency of the FTX exchange resulted in a bankruptcy filing nine days later, just before the bitcoin low. Recent Securities and Exchange Commission (SEC) complaints against the largest international and domestic exchanges have also impacted cryptocurrency prices.

Price Action. Historically, a 50% move off the bitcoin low has been a good sign the bottom is in, though in 2015 such a move was followed by a retest of the low. The 100% return level has been the point when the price does not return to the prior low. This cycle, bitcoin crossed the 50% threshold on Jan. 25 and touched the 100% threshold for a single day on July 13 before declining back toward current levels. Today, the price action, near \$30,000, suggests the low could be in the past; it's too early, however, to rule out a significant retest.

What Does It Mean if Spring Is Here?

The two crypto springs have been characterized by 1) durations of roughly 18 months from trough to halving, 2) lower average monthly returns, 3) less interest from the public and 4) regulatory pressure resulting in uncertainty about the relevant laws.

Length: 18 Months. We define crypto spring as the time from the bitcoin trough to the next halving. Estimates of when exactly the next halving will occur vary, but assuming blocks take between 9.5 and 10 minutes to be mined (consistent with history) implies that it will occur in approximately 260 to 285 days, or some time next April. If the trough was indeed on Nov. 21, 2022, an April 2024 halving would result in this cycle's spring clocking in at about 18 months, consistent with springs of the 2012-2016 and 2016-2020 cycles.

Monthly Returns: Lower but Positive. In the spring of the 2012-2016 and 2016-2020 cycles, monthly returns averaged 7% and 8%, respectively. Calculating from December (the first month after the bottom) so far in this cycle, bitcoin has risen 10% per month. While higher than those of many other assets, these monthly returns are noticeably lower than in

other seasons of the bitcoin cycle. Cycle 1, overall, averaged 19% per month, and cycle 2 averaged 9%. The current cycle is averaging 5% per month.

Public Interest: Lowest of the Cycle. Public interest, as captured by Google, is lowest in the spring. Public interest in the spring is even lower than in crypto winter bear markets. Data from Google Trends suggests interest fell 62% from the peak of the 2012-13 bull market to the trough, and another 50% during the crypto spring. In the 2016 cycle, interest fell 89% at the low in price and then another 5% as bitcoin rose during the crypto spring. This cycle, interest fell 66% from peak to the trough in price, and interest has fallen another 28% since then, even as the price of bitcoin has risen.

Regulatory Pressure: High. With only two examples, it is difficult to draw conclusions, but historically, most of the regulatory pressure has emerged in winter and spring. The recent headlines about the SEC suing two important exchanges are good examples of spring phenomena. In past early winters, just after the peak, we assume regulators and enforcement may have not yet identified the key issues or gathered enough evidence to bring the most complicated cases. Ironically, it's not until near when the bottom is in that new regulatory rules or opinions have emerged and the excesses of the last cycle are prosecuted and resolved. In the first cycle, New York's BitLicense regulation was first discussed in 2014. However, its final public comment period began in February 2015, the final rule went into effect in August 2015 and the state issued its first BitLicense in September 2015. In 2019, Facebook's libra cryptocurrency led to testimony on Capitol Hill and formal responses from some European countries. In September 2019, after the initial coin offering era, the SEC reached a \$24 million settlement with Block One on an unregistered securities offering. This cycle, SEC complaints, bankruptcies and various enforcement actions are working their way through the courts and generating headlines thus far in 2023. While there is no way to predict future regulatory action, pressure could continue to be high due to all the press and fallout from recent events and headlines.

Spring Is Here: Time to Get Educated

In conclusion, it looks like we have entered a typical crypto spring: Spring returns have been lower, though our only two examples have still been positive, most people have lost interest and regulatory questions are slowly being answered. It's possible this spring will be worse than our two other examples due to either regulatory pressures or a US economic recession. Judging from the last two cycles, we are only about halfway through crypto spring, with approximately ten months before the next halving. Using history as a guide, we expect more regulatory/enforcement developments, both positive and negative, as the year unfolds. Our goal is not to

recommend buying or selling bitcoin, but to educate investors about the cyclical tendencies in returns, investor interest and news flow. Two cycles are not enough to draw robust conclusions, though some might be tempted to try to paint a more bullish case based on two examples. We are more interested in preparing investors for the next halving, which is traditionally when price action encourages more people to become interested in learning the pros and cons of cryptocurrency. While seasonal patterns may soon become more favorable, we caution that if any of our three primary risks—encryption breaking, software bugs and coordinated government action—emerge before the halving, the cycle may not follow historical patterns. In conclusion, it is a great time to ask questions and learn about crypto in case the cycle repeats a fourth time.

Glossary

Bitcoin Difficulty - A variable used by the bitcoin protocol to help keep the rate of production stable throughout a cycle.

Block Reward - Bitcoin given to crypto miners for approving a block of transactions.

Crypto Spring - The period between the trough and halving

Crypto Summer - The period between the halving and when the prior peak is regained

Crypto Fall - The period between when the prior peak is regained and the new peak

Crypto Winter - The period between the new peak and the trough

Correlation - This is a statistical measure of how two securities move in relation to each other. This measure is often converted into what is known as correlation coefficient, which ranges between -1 and +1. Perfect positive correlation (a correlation coefficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random. A correlation greater than 0.8 is generally described as strong, whereas a correlation less than 0.5 is generally described as weak.

Drawdown - Refers to the largest cumulative percentage decline in net asset value or the percentage decline from the highest value or net asset value (peak) to the lowest value net asset value (trough) after the peak.

Miner - Computers that approve blocks of transactions on the bitcoin blockchain.

Hash - A coded identifier produced by a hash function.

Halving - An event that occurs roughly every four years, where the block reward that is awarded to miners is reduced by 50% to create a supply shortage.

Thermocap - Measures how much money has been invested in bitcoin since its inception, calculated by summing the number of bitcoins that have been mined each day and multiplying that by each day's market price.

Disclosure Section

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- Certain Digital Asset funds and products, allow investors to invest on a more frequent basis than investors may withdraw from the fund or product, and interests in such funds or products are generally not freely transferrable. This means that, particularly given the volatility of Digital Assets, an investor will have to bear any losses with respect to its investment for an extended period of time and will not be able to react to changes in the price of the Digital Asset once invested (for example, by seeking to withdraw) as quickly as when making the decision to invest. Such Digital Asset funds and products, are intended only for persons who are able to bear the economic risk of investment and who do not need liquidity with respect to their investments.
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- Digital Asset exchanges have limited operating and performance histories and are not regulated with the same controls or customer protections available to more traditional exchanges transacting equity, debt, and other assets and securities. There is no assurance that a person/exchange who currently accepts a Digital Asset as payment will continue to do so in the future.
- The regulatory framework of Digital Assets is evolving, and in some cases is uncertain, and Digital Assets themselves may not be governed and protected by applicable securities regulators and securities laws, including, but not limited to, Securities Investor Protection Corporation coverage, or other regulatory regimes.
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For index, indicator and survey definitions referenced in this report please visit the following: <https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions>

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General: Hypothetical performance should not be considered a guarantee of future performance or a guarantee of achieving overall financial objectives. Asset allocation and diversification do not assure a profit or protect against loss in declining financial markets.

Hypothetical performance results have inherent limitations. The performance shown here is simulated performance not investment results from an actual portfolio or actual trading. There can be large differences between hypothetical and actual performance results.

Despite the limitations of hypothetical performance, these hypothetical performance results may allow clients and Financial Advisors to obtain a sense of the risk / return trade-off of different asset allocation constructs.

Investing in the market entails the risk of market volatility. The value of all types of securities may increase or decrease over varying time periods.

This analysis does not purport to recommend or implement an investment strategy. Financial forecasts, rates of return, risk, inflation, and other assumptions may be used as the basis for illustrations in this analysis. They should not be considered a guarantee of future performance or a guarantee of achieving overall financial objectives. No analysis has the ability to accurately predict the future, eliminate risk or guarantee investment results. As investment returns, inflation, taxes, and other economic conditions vary from the assumptions used in this analysis, your actual results will vary (perhaps significantly) from those presented in this analysis.

The assumed return rates in this analysis are not reflective of any specific investment and do not include any fees or expenses that may be incurred by investing in specific products. The actual returns of a specific investment may be more or less than the returns used in this analysis. The return assumptions are based on hypothetical rates of return of securities indices, which serve as proxies for the asset classes. Moreover, different forecasts may choose different indices as a proxy for the same asset class, thus influencing the return of the asset class.

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Equity securities may fluctuate in response to news on companies, industries, market conditions and general economic environment.

An investment in an **exchange-traded fund** involves risks similar to those of investing in a broadly based portfolio of equity securities traded on an exchange in the relevant securities market, such as market fluctuations caused by such factors as economic and political developments, changes in interest rates and perceived trends in stock and bond prices. Investing in an international ETF also involves certain risks and considerations not typically associated with investing in an ETF that invests in the securities of U.S. issues, such as political, currency, economic and market risks. These risks are magnified in countries with emerging markets, since these countries may have relatively unstable governments and less established markets and economies. ETFs investing in physical commodities and commodity or currency futures have special tax considerations. Physical commodities may be treated as collectibles subject to a maximum 28% long-term capital gains rates, while futures are marked-to-market and may be subject to a blended 60% long- and 40% short-term capital gains tax rate. Rolling futures positions may create taxable events. For specifics and a greater explanation of possible risks with ETFs, along with the ETF's investment objectives, charges and expenses, please consult a copy of the ETF's prospectus. Investing in sectors may be more volatile than diversifying across many industries. The investment return and principal value of ETF investments will fluctuate, so an investor's ETF shares (Creation Units), if or when sold, may be worth more or less than the original cost. ETFs are redeemable only in Creation Unit size through an Authorized Participant and are not individually redeemable from an ETF.

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Treasury Inflation Protection Securities' (TIPS) coupon payments and underlying principal are automatically increased to compensate for

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inflation by tracking the consumer price index (CPI). While the real rate of return is guaranteed, TIPS tend to offer a low return. Because the return of TIPS is linked to inflation, TIPS may significantly underperform versus conventional U.S. Treasuries in times of low inflation.

Venture Capital investments involve a high degree of risk and are not appropriate for all investors. Financial and operating risks confronting startups are significant. While targeted returns should reflect the perceived level of risk in any investment situation, such returns are unrealized and based solely on the startup's own estimate of the current value of its fund investments, are not verified or audited by third party valuation, and do not represent actual return of capital or gain, may never be realized and/or may not be adequate to compensate an investor for risks taken. Loss of an investor's entire investment is possible and can easily occur. Moreover, the timing of any return on investment is highly uncertain given the illiquid nature of venture capital investments. The venture capital market is highly competitive and the percentage of companies that survive and prosper is small. Startup investments often experience unexpected problems in the areas of product development, manufacturing, marketing, financing, and general management, among others, which frequently cannot be solved. In addition, startups may require substantial amounts of financing, which may not be available through institutional private placements, the public markets or otherwise.

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The returns on a portfolio consisting primarily of **environmental, social, and governance-aware investments (ESG)** may be lower or higher than a portfolio that is more diversified or where decisions are based solely on investment considerations. Because ESG criteria exclude some investments, investors may not be able to take advantage of the same opportunities or market trends as investors that do not use such criteria. The companies identified and investment examples are for illustrative purposes only and should not be deemed a recommendation to purchase, hold or sell any securities or investment products. They are intended to demonstrate the approaches taken by managers who focus on ESG criteria in their investment strategy. There can be no guarantee that a client's account will be managed as described herein.

Asset allocation and diversification do not assure a profit or protect against loss in declining financial markets.

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