

Global Investment Committee | October 01, 2025

Asset Allocation Considerations for Cryptocurrency

Cryptocurrency has attracted significant attention in recent years, given its outsized returns, elevated volatility, growth to \$4 trillion in market capitalization and increased support from the Trump administration and Congress. Due to product innovation, investors may now access cryptocurrency through exchange-traded products, which facilitates the possibility of allocating to the emerging asset class in a multiasset portfolio.

The Global Investment Committee (GIC) considers cryptocurrency as a speculative and increasingly popular asset class that many investors, but not all, will seek to explore. We place the emerging asset class within real assets and focus our commentary here primarily on bitcoin, which we consider a scarce asset, akin to digital gold. While the GIC allocation models will not include explicit allocations to cryptocurrency, we aim to support our Financial Advisors and clients, who may flexibly allocate to cryptocurrency as part of their multiasset portfolios.

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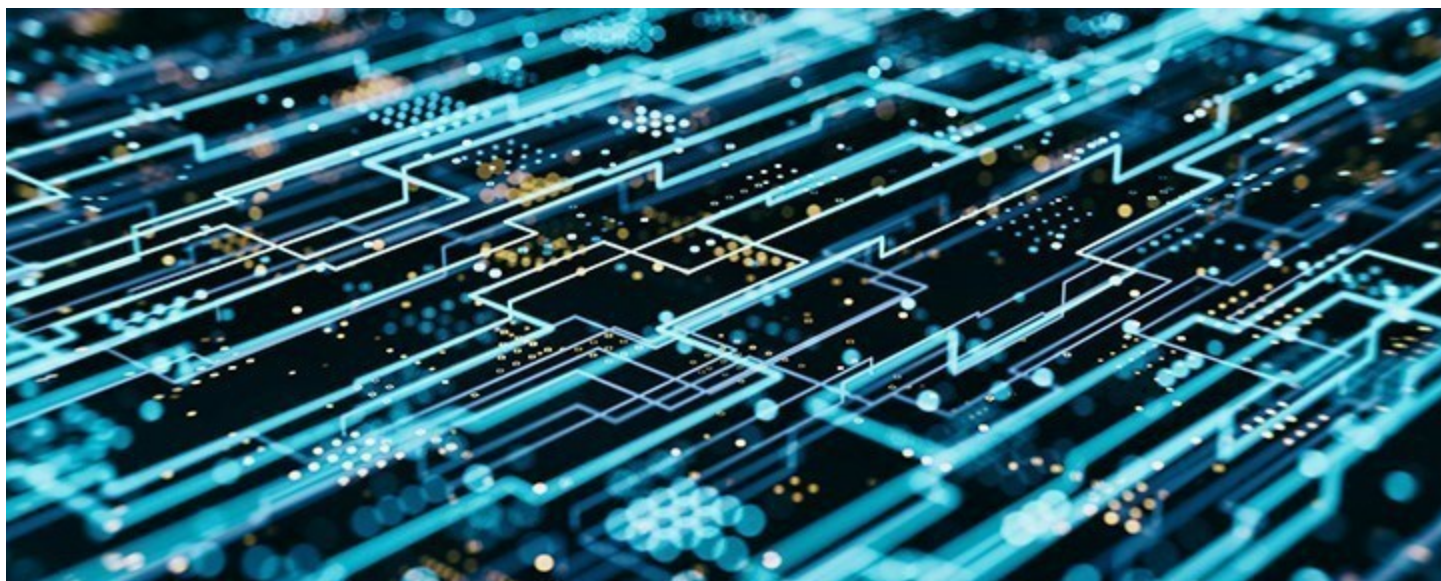
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ASSET ALLOCATION CONSIDERATIONS FOR CRYPTOCURRENCY

According to our capital markets assumption framework, calculated in March 2025, we estimated the following for cryptocurrency over the strategic, seven-year horizon: geometric and arithmetic returns of 6.0% and 17.2%, respectively; annualized volatility of 55.3%; and correlation of approximately 0.50 with US large-cap equities. Based on these quantitative characteristics, cryptocurrency bears similarities to US large-cap growth equity positions.

That said, while bitcoin may increasingly trade like a high-beta, large-cap growth stock, it is a “zero-carry” asset—unlike equities but like some commodities—with no income-related properties (dividends or interest) to underpin its valuation. Critically, that means that bitcoin often trades on so-called technicals, or relative to other fundamentally cash-flow-anchored assets. These valuation challenges contribute to its annualized volatility, which is approximately four times that of the S&P 500 Index. The GIC’s ultimate focus is always risk management around wealth preservation. As such, an asset with potential volatility of 55%, and one that could experience a 70% maximum drawdown over a 12-month period, according to the 95th percentile result from our simulation testing (see Exhibit 8), naturally leads us toward conservatism in our guidance.

In this Special Report, we seek to provide guidelines for cryptocurrency allocations in multiasset portfolios, currently most likely to be implemented through exchange-traded products. With an aim to address the risk of overconcentration in this asset class, we consider qualitative and quantitative assessments of its stand-alone and portfolio-level risk contributions. We caution that the healthy financial conditions in the post-COVID environment, along with a more favorable regulatory backdrop, may have supported the asset class in unrepeatable ways. We note that the asset class experienced strongly negative annualized returns during periods when the CBOE Volatility Index (VIX) exceeded 25, particularly when excluding 2020’s volatility spike, when cryptocurrency momentarily thrived amid economic shutdowns. The asset class’s correlations with other risky assets have increased over time, diminishing its role as a diversifier. We then conduct a series of quantitative tests on cryptocurrency’s potential stand-alone drawdowns and portfolio-level risk contributions.

Together, these observations underscore the value of taking a conservative approach to cryptocurrency allocations in multiasset portfolios, summarized in Exhibit 12. We recommend limiting initial allocations to 0% each for the Wealth Conservation and Income portfolios; 2% for the Balanced Growth portfolio; 3% for the Market Growth portfolio; and 4% for the Opportunistic Growth portfolio. Moreover, we suggest that Financial Advisors and clients rebalance multiasset portfolios with cryptocurrency allocations, preferably on a quarterly basis or at least on an annual basis.

Categorizing Cryptocurrency: Seeking Analogues and Comparisons

Prior to addressing allocation considerations for multiasset portfolios, we must wrestle with where to place cryptocurrency within an asset class taxonomy. Given its characteristics, the GIC has categorized cryptocurrency as a (publicly traded) real asset, along with commodities, energy infrastructure and real estate investment trusts (REITs). In this section, we will discuss some analogues for investors that have helped us to reach this conclusion.

While cryptocurrency has existed for more than 15 years, it remains the newest and arguably least understood asset class. Since its launch in 2009, bitcoin has experienced just one recession—and in an environment of historically low interest rates. Moreover, for much of its history, bitcoin remained unavailable to the full spectrum of investors. As such, unlike with traditional asset classes, we must extrapolate how bitcoin and other cryptocurrencies would respond to other macro environments—and how investors would adjust their cryptocurrency holdings in response to severe economic and market shocks.

When establishing potential ranges for asset class exposure, we typically benefit from studying decades of return data, looking for edge cases and opportunities to stress-test expectations for potential macroeconomic scenarios, particularly including downturns and recessions. While bitcoin and blockchain technology have proved their viability in many respects, cryptocurrency as an investment will remain a speculative asset class until its volatility materially decreases, and investors can digest its characteristics across multiple macro and market cycles.

Investors have tended to [characterize bitcoin and other cryptocurrencies](#) in one of three ways: 1) a type of scarce commodity, akin to digital gold, offering a hedge against inflation or the debasement of fiat currencies; 2) a disruptive technology; or 3) a diversifying asset, given potentially lower correlations with other assets. Proponents of each view, summarized in Exhibit 1, have gathered supporting data through time.

For some investors, bitcoin represents something akin to digital gold: a scarce asset that requires vast amounts of energy and technology to increase its available supply. While [gold supply has grown approximately 2% per year, bitcoin supply is growing at 1% per year—and scheduled to decelerate to 0%](#) programmatically over time. Both bitcoin and gold offer “independence” to investors, as their prices fluctuate based on supply-demand conditions at an arm’s length from any individual’s or organization’s direct control or intervention.

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Exhibit 1: Investors Have Typically Viewed Cryptocurrency in One of Three Ways

Analogue	GIC's View: Practical Applications	Factors in Support	Factors Against
Digital Gold	Bitcoin	- Limited growth in supply - Driven by supply-demand vs. external control - Boosted by money supply growth and inflation	- Higher correlations to risky assets than gold - Greater likelihood of weakness in stress periods than gold - Much greater volatility than gold
Disruptive Technology	Smart-Contract Platforms (e.g., Ethereum)	Delivering a new form of programmable money (bitcoin) and permissionless app stores (smart-contract platforms like Ethereum)	Adoption's dependence on investor speculation and positive returns momentum
Diversifiers	N/A	- Historically declining volatility - Limited dependence on legal frameworks	Higher (and increasing) correlations than gold and other commodities to risky assets

Source: Morgan Stanley Wealth Management Global Investment Office (GIO), Bloomberg as of Sept. 30, 2025

Unlike most other asset classes, bitcoin and gold do not require legal frameworks to enforce any contractual obligations related to their value. Their prices tend to benefit from accelerating money supply growth and apparent threats from inflation to the profitability or cash flows of investment alternatives. Further, neither gold nor bitcoin offers any stated yield or cash flow.

For others, cryptocurrency represents a disruptive technology. Along these lines, bitcoin serves as a new type of programmable money—faster and easier to transfer and borrow against than gold. In contrast, [smart-contract platforms like Ethereum](#) represent new permissionless app stores that enable third parties to create and run fintech apps. In these visions, cryptocurrency involves a disruptive innovation for large addressable markets that are slowly increasing their level of adoption. With greater levels of adoption, cryptocurrencies become more valuable, while a reversal in adoption would diminish their value. Pricing for disruptive technologies tends to benefit from low interest rates, as lower opportunity costs allow investors to discount a future with much greater adoption. Within this framework, risk-off environments could impede future increases in adoption and potentially shrink cryptocurrency's addressable market.

Finally, some observers consider cryptocurrency as a diversifier. This pragmatic group has closely watched empirical data, including correlations, returns and volatility, to assess how allocating to cryptocurrency could impact their overall portfolios. With greater institutional adoption, increased liquidity and larger market capitalization, emerging asset classes often experience higher levels of correlations over time, while asset class-level volatility typically declines.

While each viewpoint has attracted its adherents, the GIC considers bitcoin to be akin to digital gold, while smart-contract platforms like Ethereum incorporate disruptive

technology. Both gold and disruptive technology investments have demonstrated sensitivity to money supply growth. Greater monetary debasement and inflationary pressures could bolster both gold and bitcoin, while disruptive technologies, including smart-contract platforms like Ethereum, represent long-duration assets, where lower discount rates can increase present values. While gold has a long record of relatively solid performance during periods of market stress, bitcoin's more limited history paints a mixed picture, where it has experienced higher volatility and correlation during some risk events.

Beyond bitcoin and smart-contract platforms like Ethereum, there is a multitude of smaller cryptocurrencies, with various focuses: tokenizing US Treasury bills or other assets; raising money for and controlling new decentralized entities; or acting as collectibles or other affinity assets. In this Special Report, we do not consider these smaller cryptocurrencies.

Given its intentions, this Special Report cannot adequately cover other related technologies, including:

Stablecoins. As detailed in a recent [AlphaCurrents](#) publication, stablecoins aim to maintain stable value versus a benchmark, such as the US dollar. Moreover, stablecoins operate somewhat like money market funds, holding low-risk collateral like US dollars, US Treasury bills or bank deposits. Unlike money market funds, however, stablecoins do not offer inherent interest income.

The blockchain. Meanwhile, the blockchain technology, which powers cryptocurrency, further offers "digital ledger" functionality that could potentially support asset tokenization. Over time, that application could facilitate greater investment diversification for a greater breadth of investors.

Assessing the Signal Quality From Cryptocurrency's Declining Realized Volatility

Over the past 10 years, bitcoin's volatility has declined but remains elevated, as indicated in Exhibit 4. Several factors may have contributed to that decrease: larger market capitalizations; deeper liquidity; the launch of futures and options trading; the emergence of listed exchange-traded products; fewer regulatory risks; and fewer technical questions concerning the technology's functionality.¹ Recently, more favorable policies from the Trump administration may have further dampened volatility, but these effects could reverse under a less cryptocurrency-friendly administration.

We caution that, despite the long-term trend, cryptocurrency volatility may increase in the future. Along with periods of macro and market stress, realized volatility would likely increase in the event of global conflict; solar flares that affect the electrical grid; natural disasters that impede cryptocurrency mining activities or cause interruptions to crypto exchanges; or other technical issues. Quantum computing or other methodologies could help bad actors to break existing encryption methods, allowing for the theft of older cryptocurrency addresses and the dumping of associated holdings. Should an undiscovered software bug emerge, or a new bug be introduced with a code change, it would likely cause a volatility shock and downward price action.

We cannot adequately quantify the probability of these unlikely occurrences, as "[black swan](#)" events, by definition, do not lend themselves neatly to analysis. In the past, software

bugs and hacks have occasionally prompted rapid 50% drawdowns in certain cryptocurrencies. We incorporate this qualitative risk assessment into the conservative approach to cryptocurrency allocations in multiasset portfolios, summarized in the Conclusion.

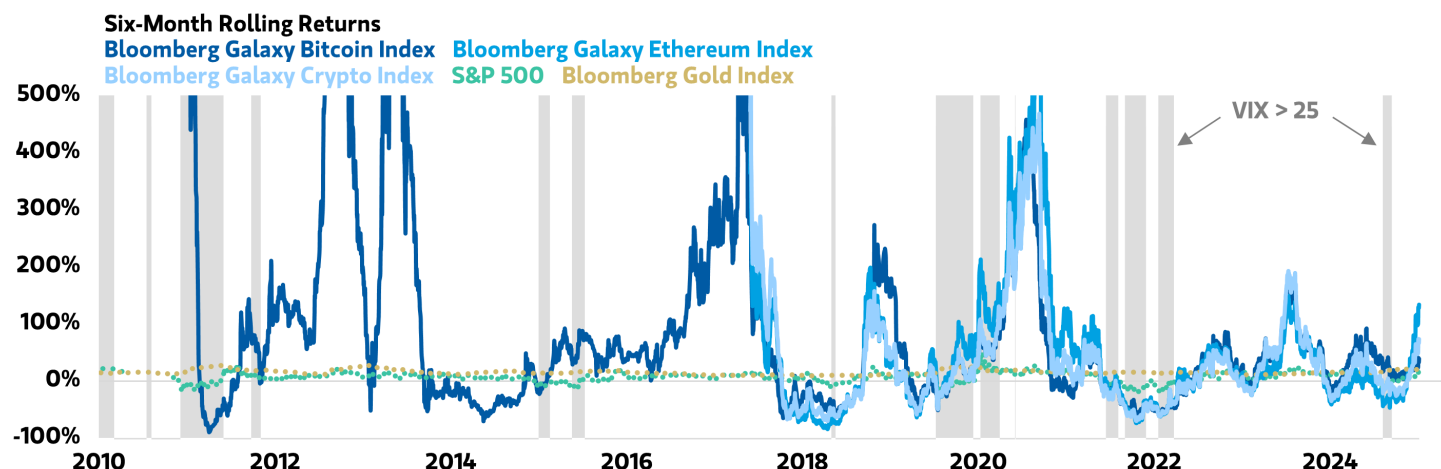
Reviewing Cryptocurrency's Historically High Returns

Since their inception, cryptocurrencies have experienced historically extreme swings in performance. While having receded somewhat since 2020, their volatility remains significantly higher than those of the primary asset classes that the GIC considers in its allocation recommendations. In Exhibit 2, we present the rolling six-month returns for three Bloomberg cryptocurrency indexes relative to the S&P 500 Index and gold.

From Exhibit 2, we observe that cryptocurrencies' six-month rolling returns have experienced much more pronounced swings than the S&P 500 and gold. Since its inception, ethereum's returns have directionally tracked bitcoin's. Looking at higher-volatility episodes, marked by the VIX rising above 25, we found that bitcoin has delivered a -47.5% annualized return since Jan. 1, 2018. Excluding the COVID-19 episode (Feb. 24, 2020, to July 28, 2020), that annualized return drops to -59.6%. Ethereum has posted annualized returns of -56.7% and -69.5% over the same periods.

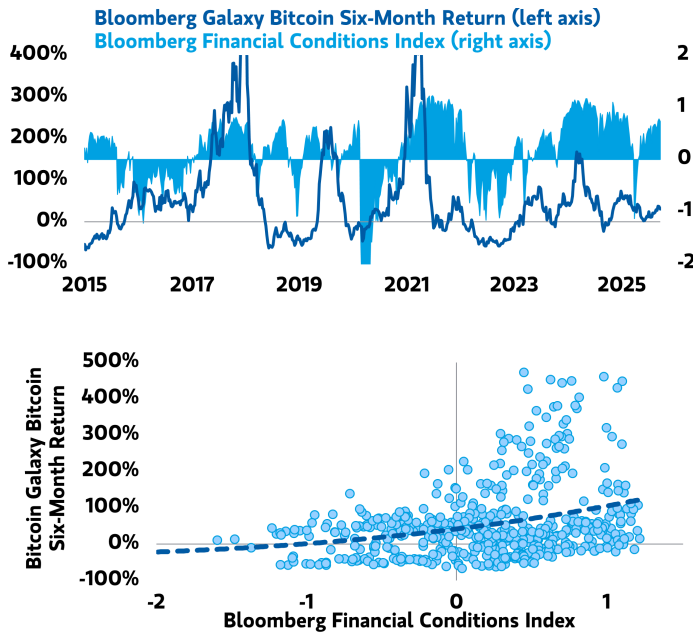
In Exhibit 3, we evaluate the positive relationship between bitcoin's returns and the Bloomberg US Financial Conditions Index. The data suggests a positive and potentially nonlinear relationship between bitcoin performance and more accommodative financial conditions.

Exhibit 2: Compared With the S&P 500 and Gold, Cryptocurrencies Have Experienced Wide Performance Swings and Have Typically Struggled in Higher-Volatility Environments



Note: The Bloomberg Galaxy Crypto and Bloomberg Galaxy Ethereum index historical price series begin in August 2017.
Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

Exhibit 3: Bitcoin Has Tended to Generate Higher Returns During Periods With More Favorable Financial Conditions



Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

The Challenges of Integrating Cryptocurrency Into Traditional Asset Allocation Frameworks

Before considering allocations to cryptocurrency in multiasset portfolios, we must first acknowledge the greater uncertainty associated with gauging its return and risk characteristics. This greater uncertainty emerges from limited historical observations and the high inherent variance in that limited history, making it challenging to infer cryptocurrency's characteristics across macroeconomic and market cycles. Moreover, we believe that cryptocurrency's characteristics have shifted since 2020, further curtailing the usefulness of the limited history for predicting future dynamics. These challenges support a more conservative approach to any potential cryptocurrency allocations.

In the GIC's [capital markets assumptions](#) process, we produce annual updates to our return and risk assumptions by asset class. To do so, we compile long-term historical data for each asset class, ideally back to the late 1940s. This extensive historical dataset facilitates a robust evaluation of each asset class's individual behavior (annualized return and risk) and joint behavior (correlations) across a diverse set of macroeconomic regimes.

Without sufficient return history, we have diminished confidence in forecasting asset classes' forward-looking

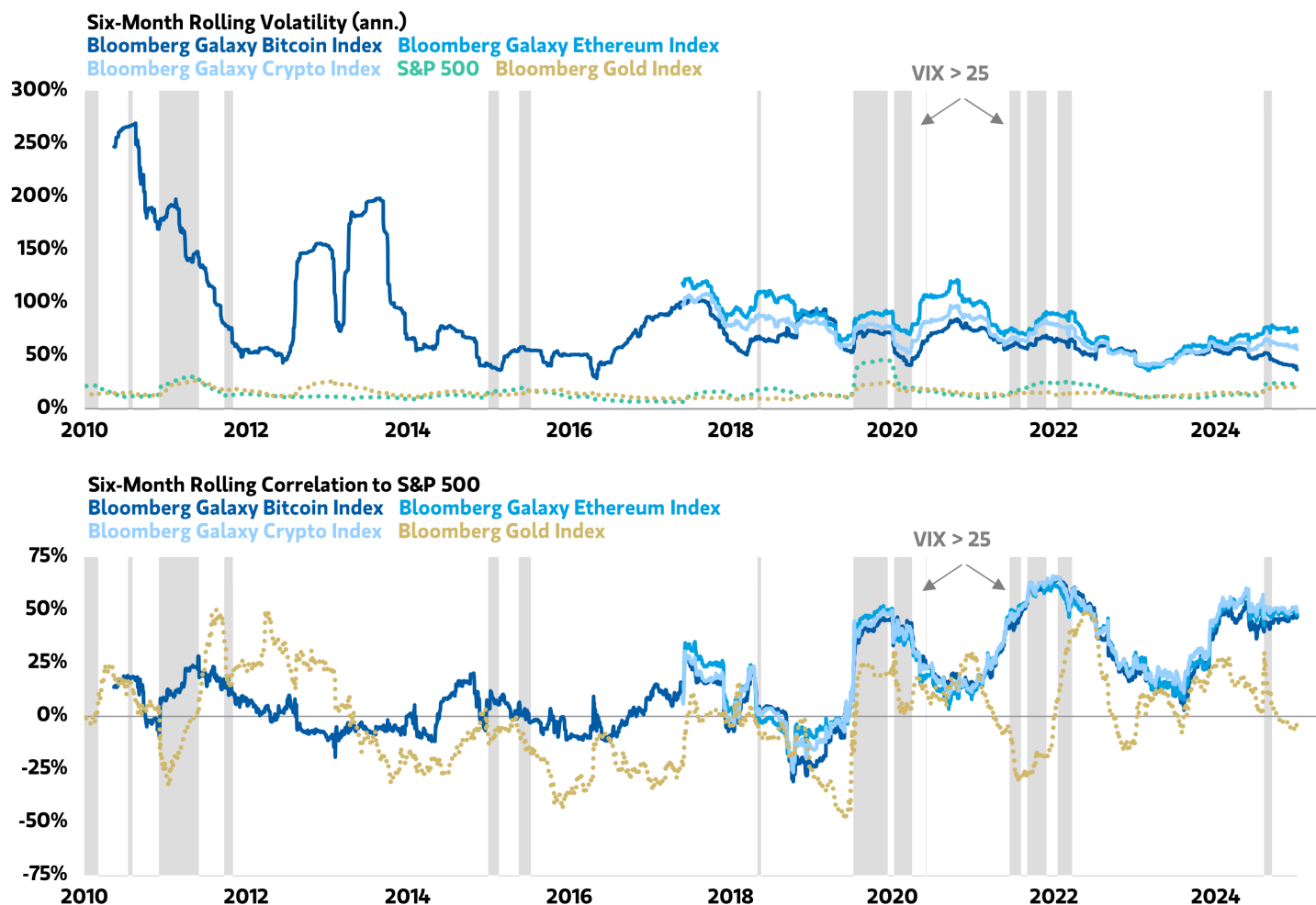
return and risk characteristics. Shorter return histories increase the potential of biasing our forecasts, owing to "overfitting" to the specific conditions in the limited historical sample. In recent years, the GIC has thoroughly explored this shortcoming, as detailed in the July 2024 report, "[What if the Future Is Inflation? Correcting Disinflationary Bias in Market Forecasts.](#)" In 2022 particularly, many investors struggled to adjust their expectations amid a period of resurgent inflation, given that most capital markets assumptions processes had grounded their extrapolations from the disproportionately low-inflation horizon that prevailed from 1990 to 2021. We describe our approach for conditioning asset class volatility and correlation estimates on regime expectations in a March 2025 [companion Special Report](#) to the GIC's annual update to its [capital market assumptions](#).

Turning to cryptocurrencies and their limited trading history, we face a daunting task of estimating forward-looking return and risk characteristics. The Bloomberg Galaxy Bitcoin Index begins in July 2010, with consistent observations emerging in 2011, yielding less than 15 years of return data, while other cryptocurrencies have even more limited histories. Moreover, bitcoin's early history reflected thin trading and elevated volatility, given the initial "novelty factor." In subsequent years, institutional adoption has introduced greater trading volume, and cryptocurrencies' collective market capitalization has reached into the trillions of dollars, leading to modestly lower volatility but increasing correlations with other risky assets.

Still, we may be "driving blind" when trying to anticipate how cryptocurrency will perform, individually and as part of a portfolio, for any market environments that differ from the past five to seven years. For example, how might cryptocurrency perform in an environment of persistently higher interest rates, tighter financial conditions or lower liquidity? Given these conditions' limited representation in the past decade, we must entertain some speculation in forecasting cryptocurrency's capital markets assumptions.

Exhibit 4 illustrates the trend in realized volatility and correlation for three Bloomberg cryptocurrency indexes. The series' relatively lower volatility and increased correlations with US equities may indicate the fruit of cryptocurrency's maturation as an asset class since 2020. Furthermore, investors may find it tempting to assume that other asset classes with which cryptocurrency shares some characteristics, particularly commodities or gold, could serve as reliable proxies. Yet, we believe that this assumption may result in misleading conclusions. The bottom panel of Exhibit 4 illustrates that S&P 500-gold correlations have frequently declined in periods of elevated volatility (defined here by VIX readings above 25), while S&P 500-cryptocurrency correlations have tended to spike during those same instances.

Exhibit 4: Cryptocurrencies' Historical Volatility and Correlations



Note: The Bloomberg Galaxy Crypto and Bloomberg Galaxy Ethereum index historical price series begin in August 2017.
Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025.

Relative to Established Asset Classes, Cryptocurrency Has Experienced Greater Drawdowns

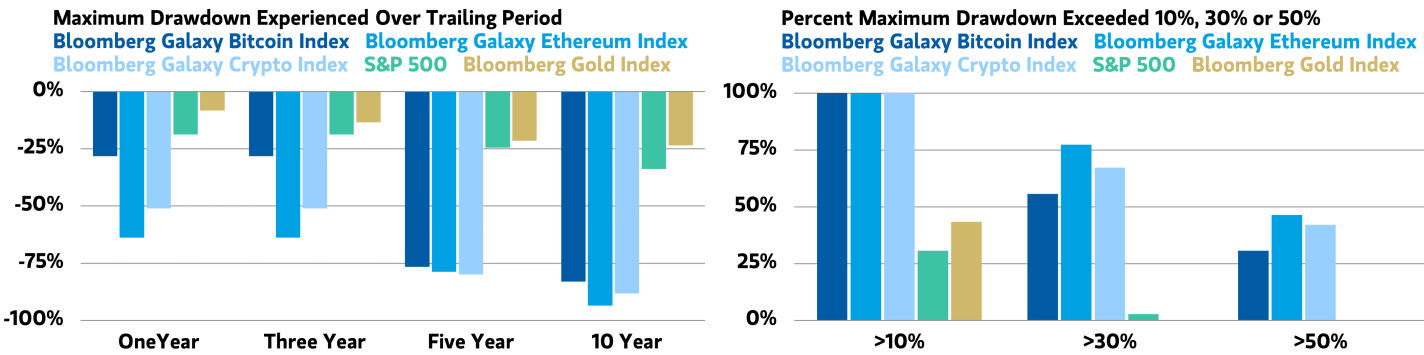
While popular attention has concentrated on crypto's high realized returns and its prospects for wealth creation, we believe that investors must carefully consider crypto's risk characteristics. In Exhibit 4, we observed that cryptocurrencies' volatility levels have declined, particularly over the previous year. Even if the asset class's volatility were to stabilize at these levels, we believe that the asset class would remain susceptible to materially higher return volatility than US equities or gold.

While volatility provides a simple measure of price fluctuations, we recommend developing a fuller picture by looking at more targeted risk measures. Drawdowns, which capture investments' declines from their high-water marks,

may better articulate the extent of an investment's downside, or "left-tail," risk. We focus on maximum drawdowns, defined as the largest peak-to-trough decline over a defined period. While volatility ascribes equal treatment to upside and downside fluctuates, we believe that investors will naturally distinguish between the consequences of large upside and downside returns.

Exhibit 5 contrasts cryptocurrencies' historical drawdowns versus those for the S&P 500 and gold. The left panel illustrates cryptocurrencies' greater maximum drawdowns over multiple trailing horizons. The right panel further illustrates percentage of rolling six-month periods in which each asset class has experienced a maximum drawdown of more than 10%, 30% or 50%. Since 2010, the Bloomberg Bitcoin Galaxy Index has experienced a maximum drawdown of at least 10% in each rolling six-month period; a 30% or greater drawdown in 50% of such periods; and a 50% or greater drawdown in 30% of periods.

Exhibit 5: Cryptocurrencies' Maximum Drawdowns Have Meaningfully Exceeded Those for the S&P 500 and Gold



Note: The Bloomberg Galaxy Crypto and Bloomberg Galaxy Ethereum index historical price series begin in August 2017. The right panel's percentages are based on rolling six-month period observations. Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

Studying Cryptocurrency's Potential Forward-Looking Risk, Using Our Capital Markets Assumptions

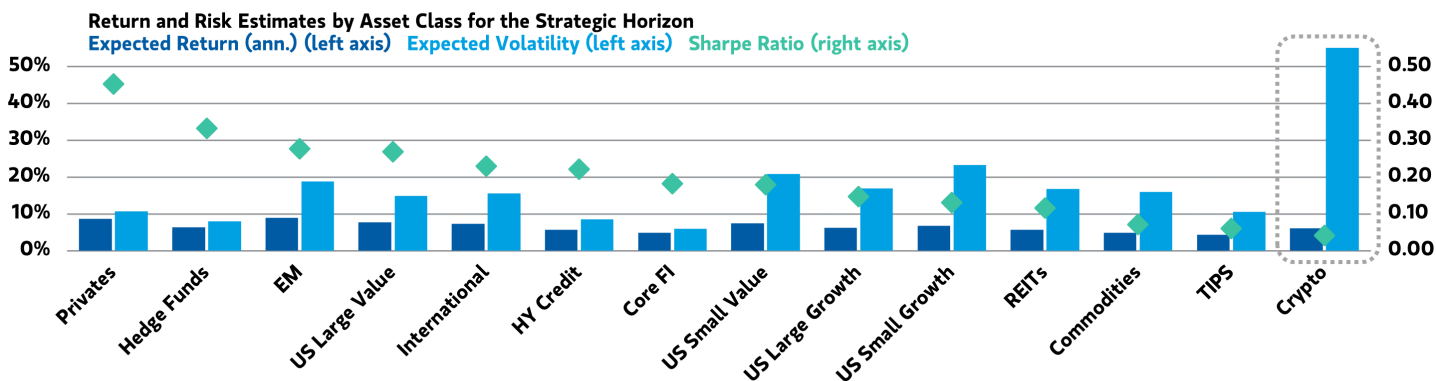
Given the limited historical data on cryptocurrency, we believe it is helpful to introduce hypothetical scenario testing, based on forward-looking simulations. While a helpful complement to historical study, simulation-based analysis still requires us to make assumptions on cryptocurrency's expected returns and volatility. As a positive, however, hypothetical testing offers the flexibility to evaluate as many simulations as desired. We may run separate simulations in which we test a range of values for expected returns, volatility and correlations. In this way, we may assess a broader range of potential outcomes, even as pinpointing specific variable forecasts may be challenging.

As a baseline, we apply the return and volatility estimates that we developed from a bitcoin-specific methodology that the GIC adopted in 2024, initially intended for financial

planning purposes. In accordance with our AlphaCurrents publication on this topic, the GIC approximates bitcoin's long-term return based on three fundamental supply-demand drivers: bitcoin supply growth (inversely correlated); bitcoin penetration growth (positively correlated); and money supply growth (positive correlated).² To calculate risk characteristics, the GIC derives annualized volatility and correlation from bitcoin's historical returns. To address cryptocurrency's changing dynamics, we apply an exponential weighting methodology that assigns greater influence to more recent observations. We believe this methodology establishes a reasonable starting point for our scenario testing.

Exhibit 6 contextualizes the baseline risk-return tradeoff reflected in our simulation assumptions. Owing to its [significant volatility](#), cryptocurrency ranks lower on the list in terms of expected risk-adjusted performance when considered as a stand-alone investment. Estimated correlations with multiple asset classes will allow us to assess the impact of including cryptocurrency allocations within a broader portfolio.

Exhibit 6: GIC Estimates of Major Asset Classes' Risk-Adjusted Performance for the Strategic Horizon



Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

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Simulation testing affords us the opportunity to assess potential stress conditions. That is, what if cryptocurrency's volatility does not continue to recede as nascent trends suggest? What if cross-correlations spike higher? We therefore evaluate the sensitivity of our volatility and correlation assumptions by simulating three additional scenarios in which we shock these inputs higher or lower relative to our baseline estimates.

As discussed above, observers often equate risk with volatility. The mathematics behind Monte Carlo simulation demonstrates how higher volatility may lead to extreme outcomes, but with a potentially deleterious effect. When considering a volatile investment's potential performance, a risk-seeking investor could observe that the investment has a natural downside limit of -100%, while its upside return is theoretically unbound. Despite the potential upside, Monte Carlo simulations with higher-volatility asset classes generally do not correspond with improved aggregate returns. This outcome emerges from a concept sometimes referred to as volatility drag, which reflects the amount by which an investment's average return exceeds its corresponding geometric return. As the investment's volatility increases, the gap between the arithmetic and geometric return widens. While a simplification, thinking about volatility as a drag helps to emphasize the importance of compounding and the sequence of returns to long-term performance. The volatility drag concept becomes more consequential when an investor intends to withdraw capital to satisfy periodic withdrawals, as we discuss in our Sept. 4 Special Report, "[Persistence Pays Off: How Investors Can Manage Risk and Capitalize on Time.](#)"

We compiled hypothetical scenarios to first evaluate crypto's potential risk as a stand-alone investment (Exhibit 8). We then extended the simulations to evaluate crypto's risk contributions *as part of a* multiasset portfolio in Exhibits 9, 10 and 11. For clarity, Exhibit 7 outlines the specific scenarios that we have considered.

Cryptocurrency's Risk as a Stand-Alone Investment

In this test, the simulation results are principally sensitive to our volatility expectations, which we vary to consider a range of possible scenarios, including 1) our baseline expected volatility of 55% annualized and where crypto's future volatility 2) rises by 20 percentage points ("-20%"), 3) declines by 20 pp (" +20%") or 4) rises by 40 pp (" +40%").

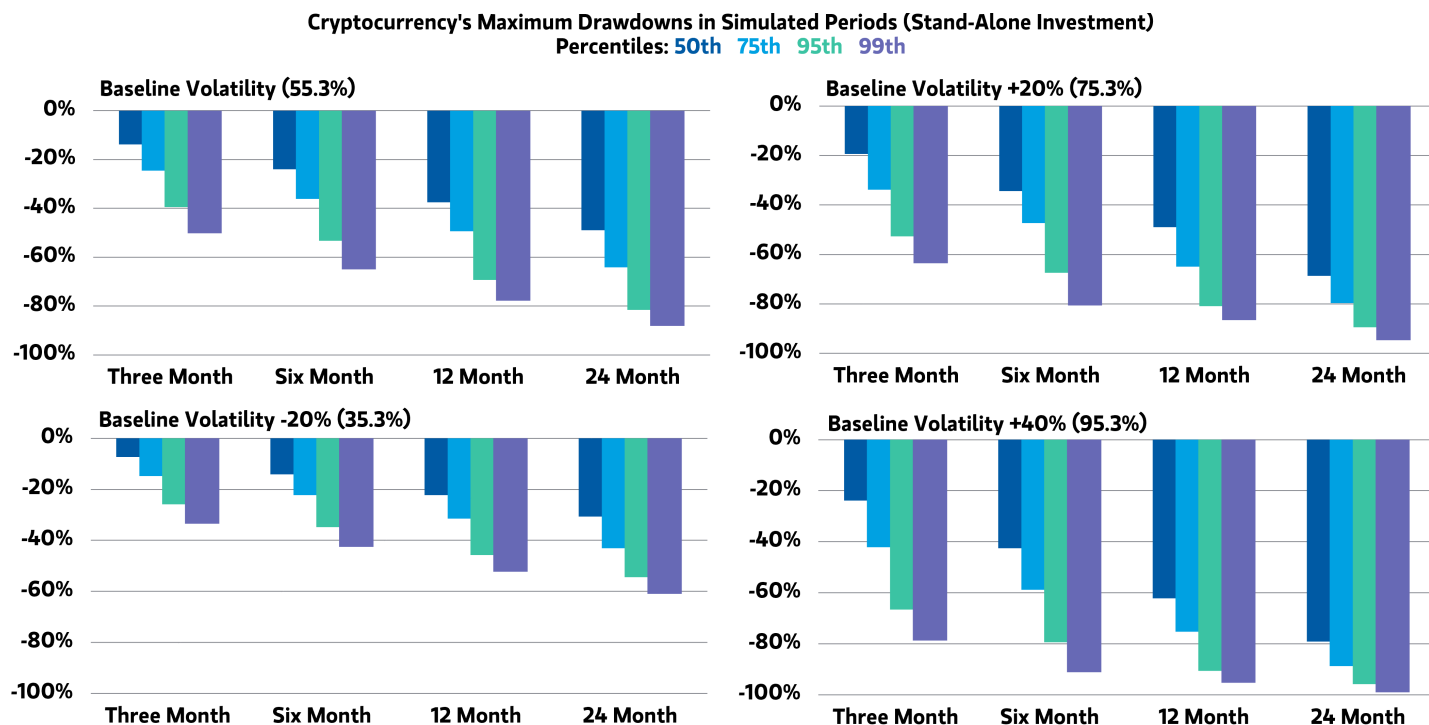
Exhibit 8 summarizes cryptocurrency's maximum drawdowns observed over three-, six-, 12- and 24-month periods, where the colored bars represent the maximum drawdown observed at successive percentile confidence levels (50th, 75th, 95th and 99th, respectively) from our simulation draws. Finally, each panel presents the results assuming different levels of volatility, as described in Exhibit 7, starting with the baseline assumption in the top-left panel. The top-right and bottom panels present the impact of assuming future volatility levels higher or lower than our baseline.

Exhibit 7: We Designed Scenarios to Observe Cryptocurrency's Potential Risk as a Stand-Alone Investment and Risk Contributions as Part of a Multiasset (Market Growth, or Risk Profile 4) Portfolio

Testing Scenario	Exhibit	What Does it Simulate?	What Does it Measure?	Cryptocurrency Allocation	Length of Monthly Simulations	Key Assumptions and "Shocks" to Baseline Inputs
1	8	Cryptocurrency as a Standalone Investment	Absolute maximum drawdowns	100% (Standalone Investment)	Three, Six, 12 and 24 Months	Crypto's Volatility: (1) Baseline (2) +20% (3) -20% (4) +40%
2	9	Cryptocurrency as an Allocation in the Market Growth Portfolio (Risk Profile 4)	Relative maximum drawdowns for Market Growth portfolios with cryptocurrency allocations versus a benchmark portfolio that does not	3% or 6% (Portfolio Allocation)	Three, Six, 12 and 24 Months	Crypto's Volatility and Correlations: (1) Baseline (2) +20% (3) -20% (4) +40%
3	10	Cryptocurrency as Allocation in the Market Growth Portfolio (Risk Profile 4)	Probability that the Market Growth portfolio's initial 6% weight swells more than 20%, 40%, 60%, 80% and 100% within 12 months	6% (Portfolio Allocation)	12 Months	Crypto's Volatility and Correlations: (1) Baseline (2) +20% (3) -20% (4) +40%
4	11	Crypto as Allocation in the Market Growth Portfolio (Risk Profile 4)	Estimated volatility and risk shares for Market Growth portfolios with varying cryptocurrency allocations	0%, 3%, 6%, 9% and 12% (Portfolio Allocation)	N/A	Crypto's Volatility and Correlations: (1) Baseline (2) +20% (3) -20% (4) +40%

Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

Exhibit 8: Cryptocurrency's Simulated Maximum Drawdowns, Applying a Range of Volatility Assumptions



Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

We may quickly gather that these results suggest that longer observation periods and higher levels of volatility will likely correspond to greater maximum drawdowns. With the baseline volatility assumption, we estimate that, at the 95th-percentile confidence level, cryptocurrency would experience a 69.3% maximum drawdown over a 12-month period.

Portfolio Construction Considerations for Cryptocurrency Allocations

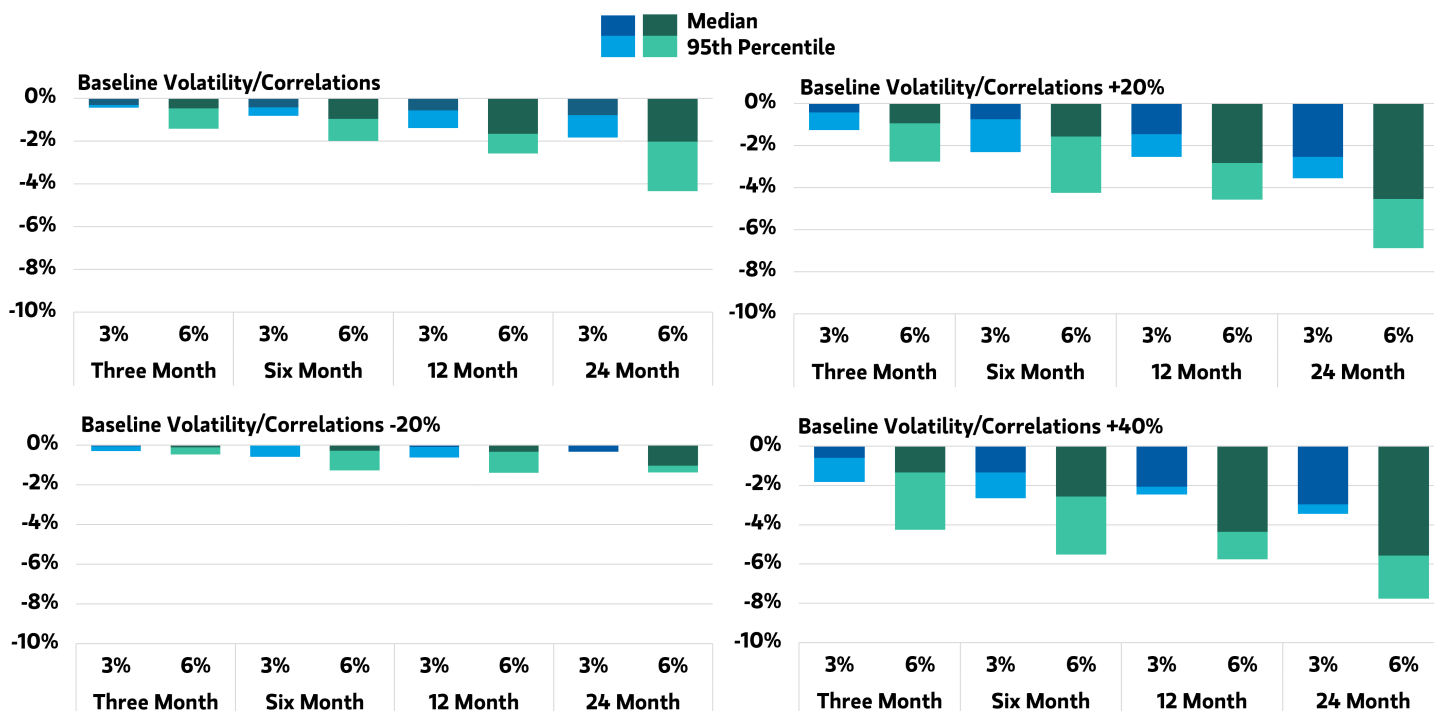
In this section, we simulate the impact of including cryptocurrency allocations in a multiasset portfolio. To perform this analysis, we used the GIC Level 0 allocations for a Market Growth (Risk Profile 4) investor, which include traditional equities and fixed income. We evaluated the relative impact on the multiasset portfolio's potential

characteristics by including varying levels of cryptocurrency allocations (3% and 6%), funded from fixed income. We selected this funding source to indicate the extent to which cryptocurrency allocations could hold sway over the holistic portfolio, but this decision does not represent any recommendation.

Portfolio-level simulations are sensitive to asset class-level volatility and correlation assumptions. In Exhibit 9, we similarly performed four sets of simulations, starting with our baseline assumptions for volatility and correlation and then three additional scenarios based on "shocked" assumptions. As in Exhibit 8, we adjust crypto's volatility and correlation inputs by 2) -20 pp, 3) +20 pp and 4) +40 pp relative to our baseline assumptions. Exhibit 9 presents the differential in maximum drawdown between portfolios with allocations to cryptocurrency versus a "benchmark" portfolio that excludes them.

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Exhibit 9: Marginal Increases in Maximum Drawdowns for Portfolios With Cryptocurrency Allocations in the Market Growth Portfolio, Applying a Range of Volatility and Correlation Assumptions

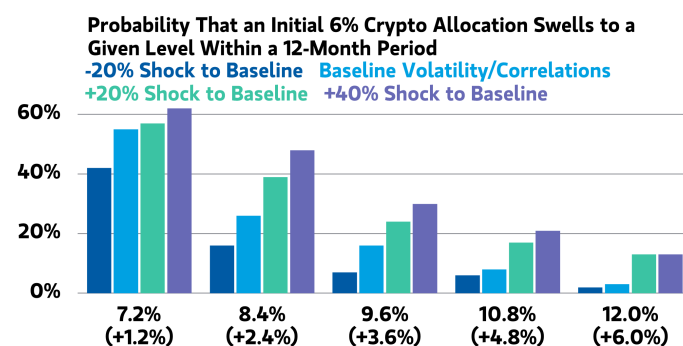


Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

While Exhibit 9 illustrates the potential incremental drawdown risk from moderate cryptocurrency allocations, Exhibit 10 evaluates the risk of significant portfolio drift resulting from larger cryptocurrency allocations (6%) in the Market Growth portfolio. Given its high variance, a larger initial cryptocurrency weight has an outsized chance of swelling well above its target (due to outperformance), exacerbated for those portfolios without disciplined rebalancing. Such swelled positions would subsequently amplify portfolio-level risk, as the portfolio would then face greater susceptibility to losses in the event of material drawdowns for the (now larger) cryptocurrency allocations.

We found that, over 12-month simulation periods, cryptocurrency allocations swelled 20% above the initial 6% weight in more than 50% of simulations. Assuming higher volatility and correlation than our baseline, cryptocurrency allocations swelled to more than double the target allocation within 12 months in more than 10% of simulations.

Exhibit 10: Probabilities That Cryptocurrency Allocations Swell Above an Initial 6% Allocation in the Market Growth Portfolio, Applying a Range of Volatility and Correlations Assumptions



Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

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In Exhibit 11, we calculated the portfolio-level volatility and “Risk Share” estimates for varying cryptocurrency allocations in the Market Growth portfolio, leveraging the four levels of volatility and correlation assumptions for the underlying asset classes. These “Risk Shares” approximate the underlying asset classes’ impact on total-portfolio risk. We compute the “Risk Share” of each asset class allocation as its average contribution to total volatility and covariance within the Market Growth portfolio.

Importantly, this portfolio-level analysis most clearly quantifies how a cryptocurrency allocation could increase a portfolio’s aggregate risk level. To underscore the most “extreme case” displayed in Exhibit 11, the portfolio-level

volatility nearly doubles from the baseline volatility and correlation assumptions and a 0% cryptocurrency allocation (“base case”) to the +40% volatility and correlation assumptions and a 12% cryptocurrency allocation (“extreme case”). Cryptocurrency’s risk share similarly ranges from 0.0% in that base case to 51.9% in the extreme case. In that extreme case, the cryptocurrency allocation becomes more impactful than even the equity allocations, based on the risk shares. Starting with a 3% cryptocurrency allocation would likely limit the potential for the multiasset portfolio to become overly volatile or for cryptocurrency’s portfolio-level risk share to rise above 35%.

Exhibit 11: Estimated Volatility (Ann.) and Risk Shares for Varying Cryptocurrency Allocations in the Market Growth Portfolio, Applying a Range of Volatility and Correlation Assumptions

Baseline Volatility/Correlations						
Metric (Est.) ↓ Cryptocurrency Allocation →		0%	3%	6%	9%	12%
Volatility (ann.)		9.7%	10.6%	11.7%	12.9%	14.1%
Risk Shares	Ultrashort Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%
	Equities	87.6%	79.0%	71.0%	63.8%	57.5%
	Fixed Income	12.4%	10.0%	8.1%	6.4%	5.1%
	Cryptocurrency		10.9%	21.0%	29.8%	37.3%

Baseline Volatility/Correlations + 20%						
Metric (Est.) ↓ Cryptocurrency Allocation →		0%	3%	6%	9%	12%
Volatility (ann.)		9.7%	11.5%	13.4%	15.4%	17.5%
Ultrashort Fixed Income		0.0%	0.0%	0.0%	0.0%	0.0%
Equities		87.6%	74.2%	63.8%	55.7%	49.4%
Fixed Income		12.4%	9.6%	7.5%	5.9%	4.6%
Cryptocurrency			16.2%	28.7%	38.4%	46.0%

Baseline Volatility/Correlations – 20%						
Metric (Est.) ↓ Cryptocurrency Allocation →		0%	3%	6%	9%	12%
Volatility (ann.)		9.7%	10.0%	10.3%	10.7%	11.2%
Risk Shares	Ultrashort Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%
	Equities	87.6%	83.7%	79.4%	75.1%	70.7%
	Fixed Income	12.4%	10.5%	8.8%	7.3%	5.9%
	Cryptocurrency		5.8%	11.7%	17.6%	23.4%

Baseline Volatility/Correlations + 40%						
Metric (Est.) ↓ Cryptocurrency Allocation →		0%	3%	6%	9%	12%
Volatility (ann.)		9.7%	12.6%	15.5%	18.3%	21.1%
Ultrashort Fixed Income		0.0%	0.0%	0.0%	0.0%	0.0%
Equities		87.6%	69.7%	58.1%	50.0%	43.9%
Fixed Income		12.4%	9.2%	7.1%	5.5%	4.3%
Cryptocurrency			21.1%	34.8%	44.5%	51.9%

Note: We compute the risk share of each asset class allocation as its average contribution to total volatility and covariance within the Market Growth portfolio
Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

Conclusion: Taking a Conservative Approach to Cryptocurrency Allocations

Based on these considerations, the GIC recommends that clients and Financial Advisors take a conservative approach to cryptocurrency allocations, currently most likely to be implemented through exchange-traded products. While the emerging asset class has experienced outsized total returns and declining volatility over recent years, cryptocurrency could experience more elevated volatility and higher correlations with other asset classes in periods of macro and market stress. Given its limited history, we have prepared a series of forward-looking simulations to stress-test stand-alone and portfolio allocations to cryptocurrency, which

highlight the potential for greater drawdowns; swelling allocation levels; and higher volatility and rising risk shares.³

Given these observations, the GIC suggests limiting portfolio-level cryptocurrency allocations to the following levels, as indicated in Exhibit 12.

Furthermore, the GIC recommends that Financial Advisors and clients rebalance multiasset portfolios with cryptocurrency allocations on a regular, periodic basis: preferably quarterly or at least annually. Such rebalancing will dampen the potential for swelling positions, which could mean outsized portfolio-level volatility and cryptocurrency risk contributions in periods of macro and market stress.

Exhibit 12: GIC Recommendations for Maximum Cryptocurrency Allocations in Multiasset Portfolios

Description	Wealth Conservation	Income	Balanced Growth	Market Growth	Opportunistic Growth
Risk Profile	1	2	3	4	5
Maximum Initial Allocation to Cryptocurrency	0%	0%	2%	3%	4%

Source: Morgan Stanley Wealth Management GIO, Bloomberg as of Sept. 30, 2025

Endnotes

¹ Galindo, Denny et al. "What Could a Futures-Based Bitcoin ETF Mean for the Asset Class?" *AlphaCurrents*, October 18, 2021, Morgan Stanley Wealth Management Global Investment Office.

² Galindo, Denny et al. "Bitcoin: A Framework for Long-Term Return Assumptions," *AlphaCurrents*, February 20, 2024, Morgan Stanley Wealth Management Global Investment Office.

³ Galindo, Denny et al. "The Four Seasons of Cryptocurrency," *AlphaCurrents*, July 20, 2023, Morgan Stanley Wealth Management Global Investment Office.

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Disclosure Section

For index, indicator and survey definitions referenced in this report please visit the following: <https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions>

Additional Index Definitions

BLOOMBERG GALAXY BITCOIN INDEX This index is designed to measure the performance of bitcoin traded in US dollars.

BLOOMBERG GALAXY CRYPTO INDEX This index is designed to measure the performance of the largest cryptocurrencies traded in US dollars.

BLOOMBERG GALAXY ETHEREUM INDEX This index is designed to measure the performance of ethereum traded in US dollars.

The **Global Investment Committee (GIC)** is a group of seasoned investment professionals from Morgan Stanley & Co. LLC, Morgan Stanley Investment Management, and Morgan Stanley Wealth Management who meet regularly to discuss the global economy and markets. The committee determines the investment outlook that guides our advice to clients. They continually monitor developing economic and market conditions, review tactical outlooks and recommend asset allocation model weightings, as well as produce a suite of strategy, analysis, commentary, portfolio positioning suggestions and other reports and broadcasts.

Spencer J. Cavallo, Denny Galindo and Jason Traum are not members of the Global Investment Committee and any implementation strategies suggested have not been reviewed or approved by the Global Investment Committee.

Glossary

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

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.

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Covariance is a measure of the degree to which returns on two risky assets move in tandem. A positive covariance means that asset returns move together, while a negative covariance means returns move inversely.

Drawdown is the peak-to-trough decline during a specific period.

Volatility This is a statistical measure of the dispersion of returns for a given security or market index. Volatility can either be measured by using the standard deviation or variance between returns from that same security or market index. Commonly, the higher the volatility, the riskier the security.

Risk Considerations

Virtual Currency Products (Cryptocurrencies)

Buying, selling, and transacting in Bitcoin, Ethereum or other digital assets ("Digital Assets"), and related funds and products, is highly speculative and may result in a loss of the entire investment. Risks and considerations include but are not limited to:

- Digital Assets have only been in existence for a short period of time and historical trading prices for Digital Assets have been highly volatile. The price of Digital Assets could decline rapidly, and investors could lose their entire investment.
- 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.
- Given the volatility in the price of Digital Assets, the net asset value of a fund or product that invests in such assets at the time an investor's subscription for interests in the fund or product is accepted may be significantly below or above the net asset value of the product or fund at the time the investor submitted subscription materials.
- Certain Digital Assets are not intended to function as currencies but are intended to have other use cases. These other Digital Assets may be subject to some or all of the risks and considerations set forth herein, as well as additional risks applicable to such Digital Assets. Buyers, sellers and users of such Digital Assets should thoroughly familiarize themselves with such risks and considerations before transacting in such Digital Assets.

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- The value of Digital Assets may be negatively impacted by future legal and regulatory developments, including but not limited to increased regulation of such Digital Assets. Any such developments may make such Digital Assets less valuable, impose additional burdens and expenses on a fund or product investing in such assets or impact the ability of such a fund or product to continue to operate, which may materially decrease the value of an investment therein.
- Due to the new and evolving nature of digital currencies and the absence of comprehensive guidance, many significant aspects of the tax treatment of Digital Assets are uncertain. Prospective investors should consult their own tax advisors concerning the tax consequences to them of the purchase, ownership and disposition of Digital Assets, directly or indirectly through a fund or product, under U.S. federal income tax law, as well as the tax law of any relevant state, local or other jurisdiction.
- Over the past several years, certain Digital Asset exchanges have experienced failures or interruptions in service due to fraud, security breaches, operational problems or business failure. Such events in the future could impact any fund's or product's ability to transact in Digital Assets if the fund or product relies on an impacted exchange and may also materially decrease the price of Digital Assets, thereby impacting the value of your investment, regardless of whether the fund or product relies on such an impacted exchange.
- Although any Digital Asset product and its service providers have in place significant safeguards against loss, theft, destruction and inaccessibility, there is nonetheless a risk that some or all of a product's Digital Asset could be permanently lost, stolen, destroyed or inaccessible by virtue of, among other things, the loss or theft of the "private keys" necessary to access a product's Digital Asset.
- Investors in funds or products investing or transacting in Digital Assets may not benefit to the same extent (or at all) from "airdrops" with respect to, or "forks" in, a Digital Asset's blockchain, compared to investors who hold Digital Assets directly instead of through a fund or product. Additionally, a "fork" in the Digital Asset blockchain could materially decrease the price of such Digital Asset.
- Digital Assets are not legal tender, and are not backed by any government, corporation or other identified body, other than with respect to certain digital currencies that certain governments are or may be developing now or in the future. No law requires companies or individuals to accept digital currency as a form of payment (except, potentially, with respect to digital currencies developed by certain governments where such acceptance may be mandated). Instead, other than as described in the preceding sentences, Digital Asset products' use is limited to businesses and individuals that are willing to accept them. If no one were to accept digital currencies, virtual currency products would very likely become worthless.
- Platforms that buy and sell Digital Assets can be hacked, and some have failed. In addition, like the platforms themselves, digital wallets can be hacked, and are subject to theft and fraud. As a result, like other investors have, you can lose some or all of your holdings of Digital Assets.
- Unlike US banks and credit unions that provide certain guarantees of safety to depositors, there are no such safeguards provided to Digital Assets held in digital wallets by their providers or by regulators.
- Due to the anonymity Digital Assets offer, they have known use in illegal activity, including drug dealing, money laundering, human trafficking, sanction evasion and other forms of illegal commerce. Abuses could impact legitimate consumers and speculators; for instance, law enforcement agencies could shut down or restrict the use of platforms and exchanges, limiting or shutting off entirely the ability to use or trade Digital Asset products.
- Digital Assets may not have an established track record of credibility and trust. Further, any performance data relating to Digital Asset products may not be verifiable as pricing models are not uniform.
- Investors should be aware of the potentially increased risks of transacting in Digital Assets relating to the risks and considerations, including fraud, theft, and lack of legitimacy, and other aspects and qualities of Digital Assets, before transacting in such assets.
- The exchange rate of virtual currency products versus the USD historically has been very volatile and the exchange rate could drastically decline. For example, the exchange rate of certain Digital Assets versus the USD has in the past dropped more than 50% in a single day. Other Digital Assets may be affected by such volatility as well.
- 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.
- Morgan Stanley Smith Barney LLC or its affiliates (collectively, "Morgan Stanley") may currently, or in the future, offer or invest in Digital Asset products, services or platforms. The proprietary interests of Morgan Stanley may conflict with your interests.
- The foregoing list of considerations and risks are not and do not purport to be a complete enumeration or explanation of the risks involved in an investment in any product or fund investing or trading in Digital Assets.

Monte Carlo Simulations

Monte Carlo Analysis Assumptions: As indicated above, this forward-looking analysis uses a Monte Carlo simulation to generate randomized, correlated returns that overall have similar characteristics to the Global Investment Committee's 2025 strategic (seven-year capital markets assumptions). The Monte Carlo simulation involves sampling from those monthly returns for the constituent asset classes. From those monthly returns, we can compute hypothetical monthly returns for portfolios constructed with a lump-sum investing or dollar-cost averaging approach as of any month in the simulated returns data.

IMPORTANT: The projections or other information generated by this Monte Carlo simulation analysis regarding the likelihood of various investment outcomes do not reflect actual investment results and are not guarantees of future results. Results may vary with each use and over time.

Hypothetical Performance

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 based on benchmark indices, not investment results from an actual portfolio or actual trading. There can be large differences between hypothetical and actual performance results achieved by a particular asset allocation.

Despite the limitations of hypothetical performance, these hypothetical performance results may allow clients and Financial Advisors to obtain

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a sense of the risk / return trade-off of different asset allocation constructs.

Indices used to calculate performance: The hypothetical performance results in this report are calculated using the returns of benchmark indices for the asset classes, and not the returns of securities, fund or other investment products.

Indices are unmanaged. They do not reflect any management, custody, transaction or other expenses, and generally assume reinvestment of dividends, accrued income and capital gains. Past performance of indices does not guarantee future results. Investors cannot invest directly in an index.

Performance of indices may be more or less volatile than any investment product. The risk of loss in value of a specific investment is not the same as the risk of loss in a broad market index. Therefore, the historical returns of an index will not be the same as the historical returns of a particular investment a client selects.

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.

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 economics. 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.

Please consider the investment objectives, risks, charges and expenses of the fund(s) carefully before investing. The prospectus contains this and other information about the fund(s). To obtain a prospectus, contact your financial advisor. Please read the prospectus carefully before investing.

Investing in **small- to medium-sized companies** entails special risks, such as limited product lines, markets and financial resources, and greater volatility than securities of larger, more established companies.

Investing in foreign markets entails risks not typically associated with domestic markets, such as currency fluctuations and controls, restrictions on foreign investments, less governmental supervision and regulation, and the potential for political instability. **Investing in currency** involves additional special risks such as credit, interest rate fluctuations, derivative investment risk, and domestic and foreign inflation rates, which can be volatile and may be less liquid than other securities and more sensitive to the effect of varied economic conditions. In addition, international investing entails greater risk, as well as greater potential rewards compared to U.S. investing. These risks include political and economic uncertainties of foreign countries as well as the risk of currency fluctuations. These risks may be magnified in countries with **emerging markets and frontier markets**, since these countries may have relatively unstable governments and less established markets and economics.

Investing in commodities entails significant risks. Commodity prices may be affected by a variety of factors at any time, including but not limited to, (i) changes in supply and demand relationships, (ii) governmental programs and policies, (iii) national and international political and economic events, war and terrorist events, (iv) changes in interest and exchange rates, (v) trading activities in commodities and related contracts, (vi) pestilence, technological change and weather, and (vii) the price volatility of a commodity. In addition, the commodities markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, participation of speculators and government intervention.

Physical precious metals are non-regulated products. Precious metals are speculative investments, which may experience short-term and long-term price volatility. The value of precious metals investments may fluctuate and may appreciate or decline, depending on market conditions. If sold in a declining market, the price you receive may be less than your original investment. Unlike bonds and stocks, precious metals do not make interest or dividend payments. Therefore, precious metals may not be appropriate for investors who require current income. Precious metals are commodities that should be safely stored, which may impose additional costs on the investor. The Securities Investor Protection Corporation ("SIPC") provides certain protection for customers' cash and securities in the event of a brokerage firm's bankruptcy, other financial difficulties, or if customers' assets are missing. SIPC insurance does not apply to precious metals or other commodities.

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Bonds are subject to interest rate risk. When interest rates rise, bond prices fall; generally the longer a bond's maturity, the more sensitive it is to this risk. Bonds may also be subject to call risk, which is the risk that the issuer will redeem the debt at its option, fully or partially, before the scheduled maturity date. The market value of debt instruments may fluctuate, and proceeds from sales prior to maturity may be more or less than the amount originally invested or the maturity value due to changes in market conditions or changes in the credit quality of the issuer. Bonds are subject to the credit risk of the issuer. This is the risk that the issuer might be unable to make interest and/or principal payments on a timely basis. Bonds are also subject to reinvestment risk, which is the risk that principal and/or interest payments from a given investment may be reinvested at a lower interest rate.

Bonds rated below investment grade may have speculative characteristics and present significant risks beyond those of other securities, including greater credit risk and price volatility in the secondary market. Investors should be careful to consider these risks alongside their individual circumstances, objectives and risk tolerance before investing in high-yield bonds. High yield bonds should comprise only a limited portion of a balanced portfolio.

Ultrashort-term fixed income asset class is comprised of fixed income securities with high quality, very short maturities. They are therefore subject to the risks associated with debt securities such as credit and interest rate risk.

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

Alternative investments often are speculative and include a high degree of risk. Investors could lose all or a substantial amount of their investment. Alternative investments are appropriate only for eligible, long-term investors who are willing to forgo liquidity and put capital at risk for an indefinite period of time. They may be highly illiquid and can engage in leverage and other speculative practices that may increase the volatility and risk of loss. Alternative Investments typically have higher fees than traditional investments. Investors should carefully review and consider potential risks before investing. Certain of these risks may include but are not limited to: Loss of all or a substantial portion of the investment due to leveraging, short-selling, or other speculative practices; Lack of liquidity in that there may be no secondary market for a fund; Volatility of returns; Restrictions on transferring interests in a fund; Potential lack of diversification and resulting higher risk due to concentration of trading authority when a single advisor is utilized; Absence of information regarding valuations and pricing; Complex tax structures and delays in tax reporting; Less regulation and higher fees than mutual funds; and Risks associated with the operations, personnel, and processes of the manager. Further, opinions regarding Alternative Investments expressed herein may differ from the opinions expressed by Morgan Stanley Wealth Management and/or other businesses/affiliates of Morgan Stanley Wealth Management.

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REITs investing risks are similar to those associated with direct investments in real estate: property value fluctuations, lack of liquidity, limited diversification and sensitivity to economic factors such as interest rate changes and market recessions.

Companies paying **dividends** can reduce or cut payouts at any time.

Growth investing does not guarantee a profit or eliminate risk. The stocks of these companies can have relatively high valuations. Because of these high valuations, an investment in a growth stock can be more risky than an investment in a company with more modest growth expectations.

Value investing does not guarantee a profit or eliminate risk. Not all companies whose stocks are considered to be value stocks are able to turn their business around or successfully employ corrective strategies which would result in stock prices that do not rise as initially expected.

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

Nondiversification: For a portfolio that holds a concentrated or limited number of securities, a decline in the value of these investments would cause the portfolio's overall value to decline to a greater degree than a less concentrated portfolio. Portfolios that invest a large percentage of assets in only one industry sector (or in only a few sectors) are more vulnerable to price fluctuation than those that diversify among a broad range of sectors.

Because of their narrow focus, **sector investments** tend to be more volatile than investments that diversify across many sectors and companies. Technology stocks may be especially volatile. Risks applicable to companies in the energy and natural resources sectors include commodity pricing risk, supply and demand risk, depletion risk and exploration risk.

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Environmental, social, and governance-aware investments (ESG) in a portfolio may experience performance that is lower or higher than a portfolio not employing such practices. Portfolios with ESG restrictions and strategies as well as ESG investments may not be able to take advantage of the same opportunities or market trends as portfolios where ESG criteria is not applied. There are inconsistent ESG definitions and criteria within the industry, as well as multiple ESG ratings providers that provide ESG ratings of the same subject companies and/or securities that vary among the providers. Certain issuers of investments may have differing and inconsistent views concerning ESG criteria where the ESG claims made in offering documents or other literature may overstate ESG impact. As a result, it is difficult to compare ESG investment products or to evaluate an ESG investment product in comparison to one that does not focus on ESG. There is no assurance that an ESG investing strategy or techniques employed will be successful. Past performance is not a guarantee or a dependable measure of future results.

Rebalancing does not protect against a loss in declining financial markets. There may be a potential tax implication with a rebalancing strategy. Investors should consult with their tax advisor before implementing such a strategy.

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