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Optimal Crypto Allocation for Portfolios

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We explore the optimal bitcoin and ether allocations in traditional 60/40 and crypto-only portfolios.

Please note that VanEck has positions in ether and bitcoin.

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In recent years, interest in cryptocurrencies has shifted from being predominantly retail-focused to becoming a significant consideration for financial advisors and institutional investors. While retail investors may have accounted for as much as 80% of exchange-traded-products (ETPs) purchasers, some forward-thinking investment advisors and pension funds have begun to accumulate positions following extensive due diligence. A significant narrative driving this growth is the unlocking of access to ETPs at more broker platforms, which we expect to accelerate in the second half of 2024, and into next year.

One of the key pitches for bitcoin (BTC) is its role as a monetary asset and a hedge against chaos and inflation, often referred to as "digital gold." Bitcoin offers a non-correlated, provably scarce asset to diversify portfolios. On the other hand, ether (ETH) is more of a pure technology investment, allowing exposure to the growth of tokenization, NFTs, and DeFi (decentralized finance). For investors wanting to capitalize on tokenization, investing in ETH may be the best approach.

This comprehensive study evaluates the impact of incorporating bitcoin and ether into traditional investment portfolios, highlighting the potential benefits and risks associated with their inclusion. The analysis underscores how a strategic allocation to cryptocurrencies can enhance portfolio performance, marking a significant evolution in asset allocation strategies.

Analysis Overview

We conducted a comprehensive study to evaluate the impact of incorporating bitcoin (BTC) and ether (ETH) into a traditional 60% equity/40% bond investment portfolio, covering the period from September 1, 2015, to April 30, 2024. The analysis comprised five main components:

1. **Optimal Constrained Allocation in a Traditional 60/40 Portfolio:** We assessed the ideal allocation of bitcoin and ether in a portfolio consisting of 60% equities and 40% bonds, with a maximum combined cryptocurrency allocation of 6%. This analysis utilized 169 sample portfolios with incremental additions of crypto exposure.

Indexes Used:

- **S&P 500 Index:** Representing 60% of the equity portion. The S&P 500 is a market-capitalization-weighted index of 500 leading publicly traded companies in the U.S.
- **Bloomberg Barclays US Aggregate Bond Index:** Representing 40% of the bond portion. The Bloomberg US Aggregate Bond Index is a broad-based benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, fixed-rate agency MBS, ABS and CMBS (agency and non-agency).
- **MarketVector Bitcoin Index:** Measures the performance of a digital assets portfolio that invests in bitcoin.
- **MarketVector Ethereum Index:** Measures the performance of a digital assets portfolio that invests in ether.

These indexes are used as benchmarks to represent broader market performance. Direct allocation to bitcoin and Ethereum may result in different outcomes due to factors such as transaction costs, liquidity and market volatility. To maintain the desired allocation proportions, all portfolios were rebalanced on a monthly basis. This rebalancing helps keep the portfolio aligned with the strategic allocation targets.

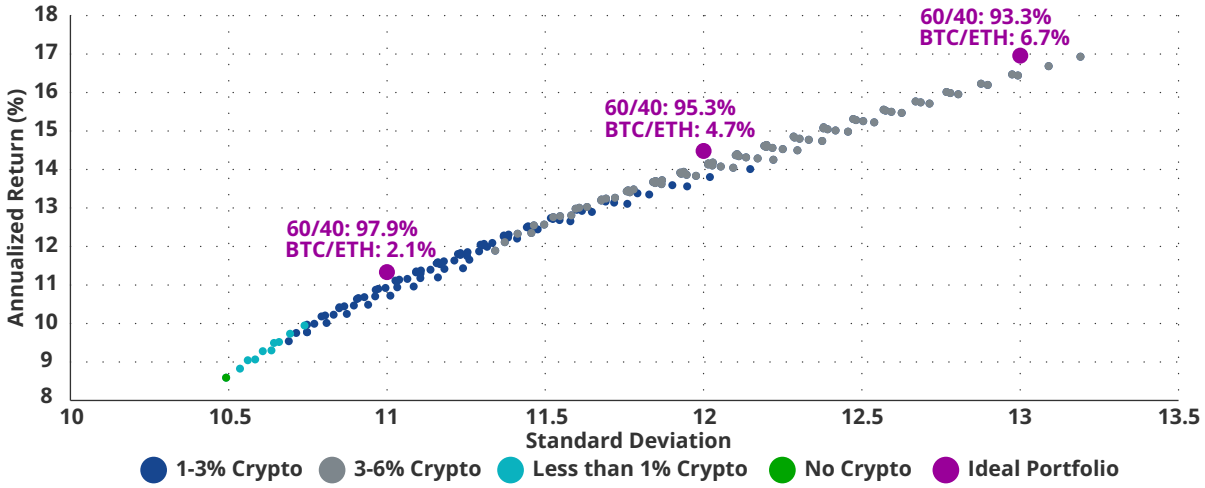
2. **Drawdown and Sharpe Ratio Analysis:** We examined the drawdown and Sharpe ratios of a subset of 16 representative portfolios to understand the risk-return tradeoffs. Our findings indicate that adding a modest allocation of cryptocurrencies (up to 6%) to a traditional 60/40 portfolio can substantially enhance the portfolio's Sharpe ratio with a relatively minor impact on drawdown. Monthly rebalancing was used to manage the allocation proportions and mitigate the effects of price volatility, helping the portfolio maintain its risk and return characteristics over time. For investors with a high-risk tolerance (up to ~20% annualized volatility), an allocation of up to 20% continues to improve the risk/reward profile of the overall portfolio. The optimal bitcoin and ether weights were approximately 70/30, providing the best risk-adjusted returns.
3. **Optimal Bitcoin and Ether Allocation in a Crypto-Only Portfolio:** We analyzed various permutations of bitcoin and ether weights in a portfolio composed solely of these two cryptocurrencies, aiming to maximize the Sharpe ratio and determine the ideal BTC/ETH allocation.
4. **Efficient Frontier Using the Optimal Crypto Portfolio:** We investigated the optimal weighting of the ideal BTC/ETH portfolio to maximize returns at various levels of volatility. This analysis illustrated a segment (with reasonable volatility levels) of the efficient frontier when integrating cryptocurrencies into the traditional 60/40 portfolio. The inclusion of a monthly rebalancing mechanism allowed the portfolios to adapt to market changes while keeping the strategic allocation intact.
5. **Time Dependence of Efficient Frontier Results:** We considered the impact of different starting points on the results from component 4. The analysis demonstrated that a larger crypto allocation consistently enhanced portfolio risk-adjusted returns across all available time periods.

1. Optimal Allocation in a Traditional 60/40 Portfolio

The primary objective was to determine the optimal allocation of bitcoin (BTC) and ether (ETH) within a traditional 60/40 portfolio, with a constraint limiting the combined weight of cryptocurrencies to a maximum of 6%. The analysis involved constructing 169 model portfolios with incremental crypto exposure, up to 3% each for BTC and ETH.

The results demonstrated that a portfolio comprising 3% BTC and 3% ETH, in conjunction with 57% S&P 500 and 37% U.S. Bonds, yielded the highest return per unit of risk (standard deviation). In essence, maintaining a conservative overall allocation of 6% in cryptocurrencies, the maximum allowable allocation achieved the highest risk-adjusted returns. Monthly rebalancing was applied to maintain these allocations, helping to manage the volatility and ensure the portfolio stayed aligned with its strategic targets.

Optimal BTC/ETH Allocation in a Traditional 60/40 Portfolio (9/1/2015 – 4/30/2024)



Source: VanEck Research as of 5/28/2024. **Past performance is no guarantee of future results. The information, valuation scenarios, and price targets in this blog are not intended as financial advice or any call to action, a recommendation to buy or sell, or as a projection of how ETH and BTC will perform in the future. Actual future performance of ETH and BTC is unknown, and may differ significantly from the hypothetical results depicted here. There may be risks or other factors not accounted for in the scenarios presented that may impede the performance. These are solely the results of a simulation based on our research, and are for illustrative purposes only. Please conduct your own research and draw your own conclusions.**

The findings indicate that a strategic inclusion of bitcoin and ether within a traditional portfolio framework can significantly enhance risk-adjusted returns, even with a conservative allocation.

2. Drawdown and Sharpe Ratio Analysis

To evaluate the risk-return tradeoffs, we analyzed 16 representative 60/40 portfolios with incremental increases in cryptocurrency allocation up to the maximum limit of 6%. The key findings were:

- **Sharpe Ratio Improvement:** The portfolio Sharpe ratio improved significantly as the cryptocurrency allocation increased.
- **Minimal Impact on Drawdown:** The maximum drawdown increased only marginally, making the higher cryptocurrency allocation an attractive tradeoff for many investors.

The data on maximum drawdown and Sharpe ratio demonstrated that a 6% cryptocurrency allocation resulted in a Sharpe ratio nearly double that of the traditional 60/40 portfolio while only modestly increasing drawdown. This highlights the favorable risk-return tradeoff when incorporating BTC and ETH into a traditional portfolio.

	Max Drawdown	Sharpe Ratio
60% 40% Portfolio	-21.54	0.78
59% 39% Portfolio, 1% Bitcoin and 1% Ethereum	-22.18	1.04
58.5% 38.5% Portfolio, 3% Bitcoin	-22.21	1.04
58.5% 38.5% Portfolio, 3% Ethereum	-22.85	1.24
57% 37% Portfolio, 3% Bitcoin and 3% Ethereum	-23.60	1.44

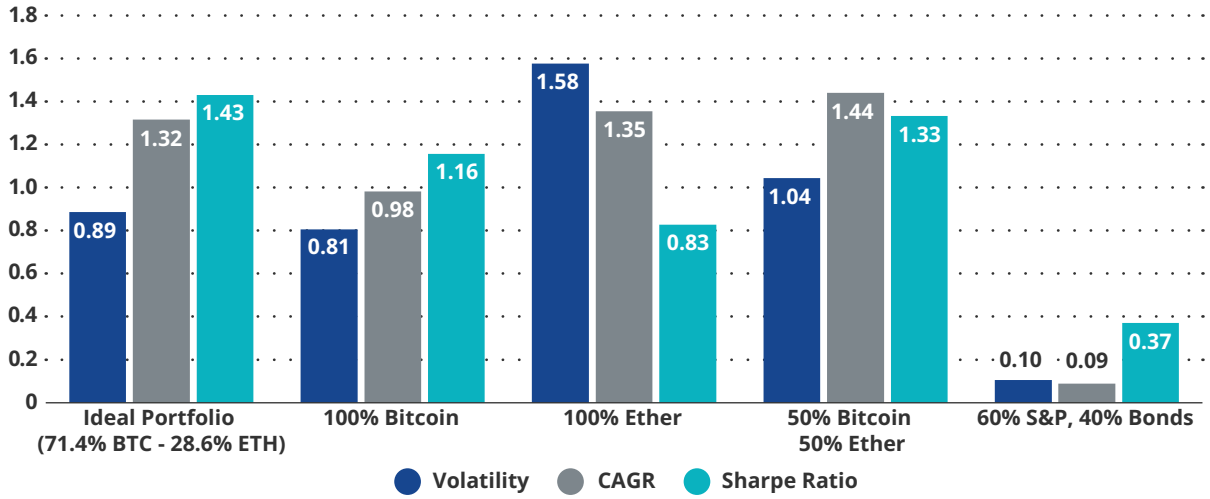
Source: VanEck Research as of 5/28/2024. **Past performance is no guarantee of future results. Sharpe ratio** is a measure used in finance to evaluate the performance of an investment compared to a risk-free asset, after adjusting for its risk. It is calculated by subtracting the risk-free rate of return (such as the return on U.S. Treasury Bonds) from the rate of return for a portfolio and then dividing the result by the standard deviation of the portfolio returns. This ratio helps investors understand how much excess return they are receiving for the extra volatility that they endure for holding a riskier asset. A higher Sharpe ratio indicates a more attractive risk-adjusted return. **The information, valuation scenarios, and price targets in this blog are not intended as financial advice or any call to action, a recommendation to buy or sell, or as a projection of how ETH and BTC will perform in the future. Actual future performance of ETH and BTC is unknown, and may differ significantly from the hypothetical results depicted here. There may be risks or other factors not accounted for in the scenarios presented that may impede the performance. These are solely the results of a simulation based on our research, and are for illustrative purposes only. Please conduct your own research and draw your own conclusions.**

These findings show the potential benefits of integrating cryptocurrencies into traditional investment portfolios, providing improved risk-adjusted returns with minimal increase in risk.

3. Optimal Bitcoin and Ether Allocation in a Crypto-Only Portfolio

Focusing exclusively on a portfolio comprising bitcoin and ether we tested various weighting combinations to determine the optimal mix for maximizing the Sharpe ratio. **The analysis revealed that the ideal allocation was 71.4% bitcoin and 28.6% ether.** This configuration yielded the highest Sharpe ratio, indicating the best risk-adjusted return for a crypto-only portfolio. The findings emphasize the importance for investors to hold both cryptocurrencies to maximize benefits. Additionally, the naïve allocation of 50% BTC and 50% ETH also demonstrated substantial advantages, reinforcing the value of diversification within the crypto asset class.

Comparative Metrics of Various Bitcoin-Ether Portfolio Allocations (9/1/2015 – 4/30/2024)



	Volatility	CAGR	Sharpe Ratio
Ideal Portfolio (71.4% BTC - 28.6% ETH)	0.89	1.32	1.43
100% Bitcoin	0.81	0.98	1.16
100% Ether	1.58	1.35	0.83
50% Bitcoin 50% Ether	1.04	1.44	1.33
60% S&P, 40% Bonds	0.10	0.09	0.37

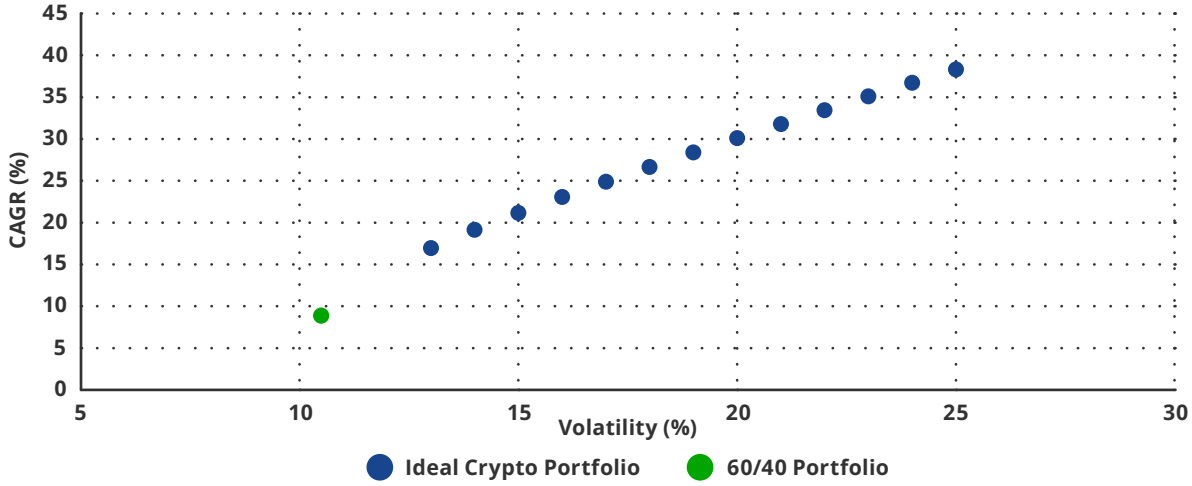
Source: VanEck Research as of 5/28/2024. **Past performance is no guarantee of future results. Volatility** refers to the fluctuation in the returns of an asset or portfolio as measured by the standard deviation of returns. Higher volatility indicates greater risk and potentially higher returns, affecting the risk-adjusted returns measured by the Sharpe Ratio. **Compound Annual Growth Rate (CAGR)** represents the rate at which the value of ether (ETH) has grown annually over a specified time period. This metric is used to provide a smoothed annual growth rate, eliminating fluctuations and giving a clearer picture of long-term investment performance. **Sharpe ratio** is a measure used in finance to evaluate the performance of an investment compared to a risk-free asset after adjusting for its risk. It is calculated by subtracting the risk-free rate of return (such as the return on U.S. Treasury Bonds) from the rate of return for a portfolio and then dividing the result by the standard deviation of the portfolio returns. This ratio helps investors understand how much excess return they are receiving for the extra volatility that they endure for holding a riskier asset. A higher Sharpe ratio indicates a more attractive risk-adjusted return. **The information, valuation scenarios, and price targets in this blog are not intended as financial advice or any call to action, a recommendation to buy or sell, or as a projection of how ETH and BTC will perform in the future. Actual future performance of ETH and BTC is unknown, and may differ significantly from the hypothetical results depicted here. There may be risks or other factors not accounted for in the scenarios presented that may impede the performance. These are solely the results of a simulation based on our research, and are for illustrative purposes only. Please conduct your own research and draw your own conclusions.**

These findings underscore the significant advantages of diversifying within the crypto asset class to achieve optimal risk-adjusted returns.

4. The Efficient Frontier When Including Cryptocurrencies

To determine the optimal allocation to cryptocurrencies within a traditional 60/40 portfolio while maintaining acceptable volatility levels, we analyzed the optimal weighting of an ideal cryptocurrency portfolio composed of 71.4% bitcoin and 28.6% ether. The objective was to maximize returns while maintaining specified volatility ranges (13%-25%), thus constructing an efficient frontier portfolio using these assets. These volatility levels are typically associated with broad investor portfolios. The resulting scatterplot indicated that integrating the optimal cryptocurrency portfolio into a traditional 60/40 portfolio can substantially enhance returns with varying degrees of risk.

Additional Volatility from Cryptocurrencies Help Overall Returns (9/1/2015 – 4/30/2024)



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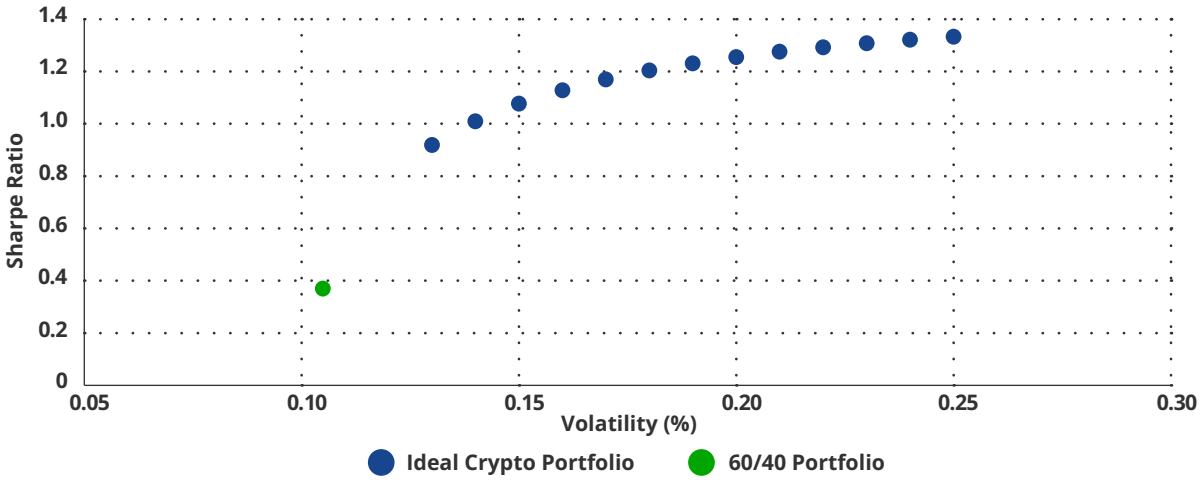
This analysis revealed a nearly linear relationship—a rarity when examining efficient frontiers—between risk and return as volatility increased. The conclusion drawn is that increased exposure to cryptocurrencies led to highly attractive risk/return tradeoffs.

Sharpe Ratio for Blended Portfolio Levels Off at 22% Volatility (9/1/2015 – 4/30/2024)



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The chart illustrates that the Sharpe ratio for the blended portfolio increases with volatility, reaching a plateau of around 22% volatility.

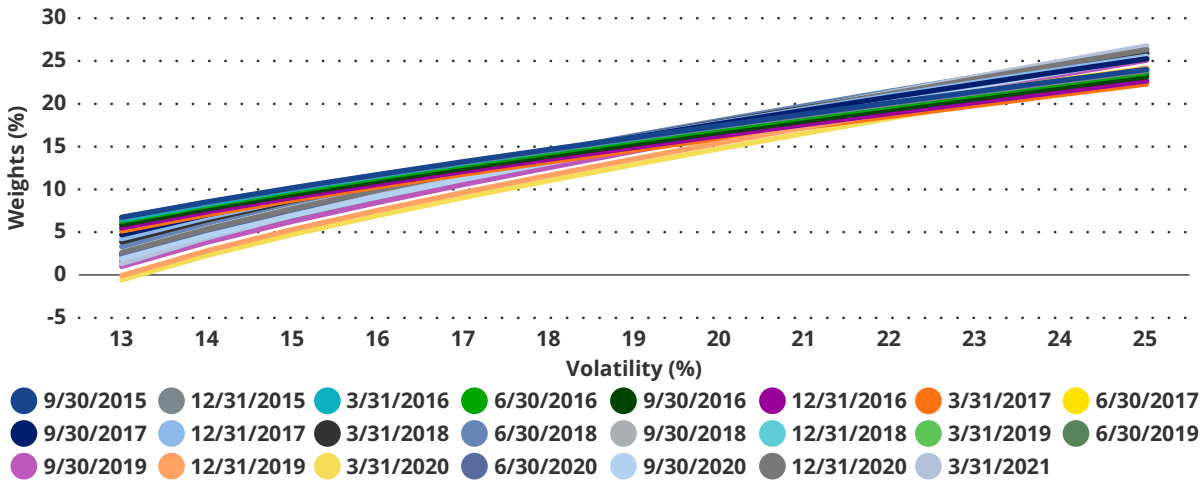
5. Time Dependence of Efficient Frontier Results

To determine whether different starting points have an impact on the risk/reward profile of the combined ideal crypto and 60/40 portfolios, we repeated the analysis in component 4, while repeatedly moving the starting point one quarter forward. Our only constraint was to include at least three years of returns. As such, we produced 23 sets of results and removed time dependence as a variable from the analysis.

Our findings were:

- The analysis consistently indicated that, across all evaluated time periods, the optimal allocation to the ideal cryptocurrency portfolio increased proportionally with the level of risk assumed.

Optimal Weights Across Volatility for Time-Independent Portfolios



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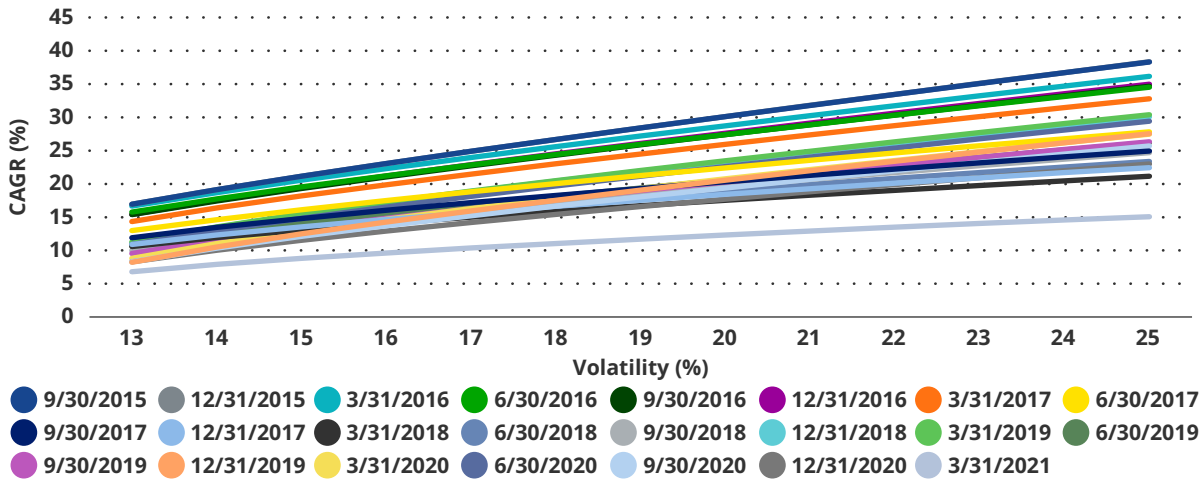
The chart illustrates that increased allocations to cryptocurrencies consistently corresponded with higher optimal weights as volatility increased across all evaluated time periods.

CAGR Across Volatility for Time-Independent Portfolios



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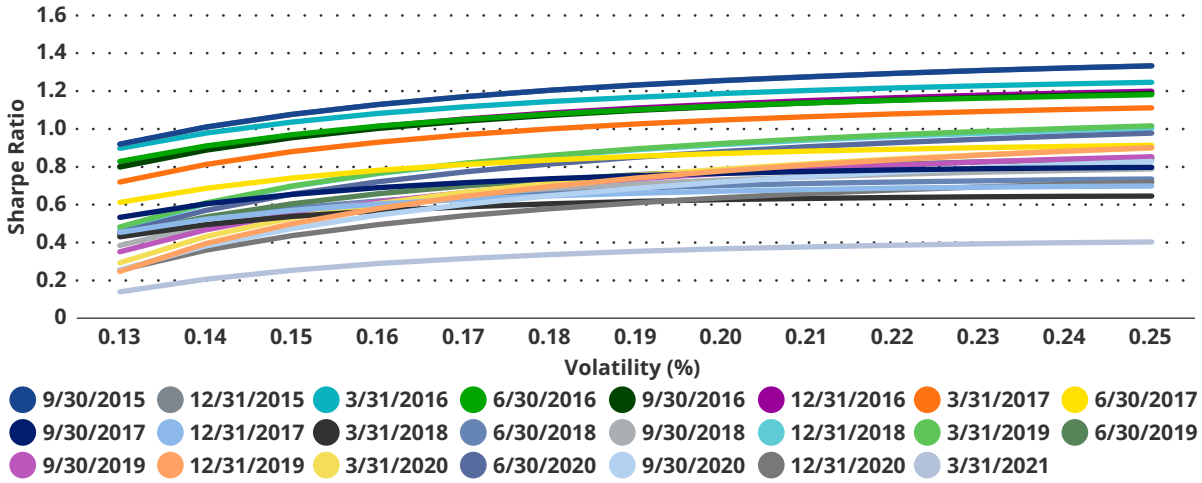
Across all evaluated time periods, increased allocations to cryptocurrencies consistently corresponded with higher CAGRs.

Sharpe Across Volatility for Time-Independent Portfolios



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The study's findings indicate that Sharpe ratios generally exhibited an upward trend with increasing volatility and higher allocations to cryptocurrencies.

Conclusion

The analysis provides robust evidence that incorporating a modest allocation of cryptocurrencies (up to 6%) into a traditional 60% equity/40% bond portfolio can significantly enhance the portfolio's Sharpe ratio while maintaining a relatively minor impact on drawdown. The optimal risk-adjusted returns for a crypto-only portfolio were achieved with an allocation approximately split 70/30 between bitcoin and ether.

While individual risk tolerance should guide investment decisions, the data indicates that a balanced inclusion of bitcoin and ether can offer substantial benefits in terms of return enhancement relative to the incremental risk introduced. These findings underscore the potential of cryptocurrencies to enhance portfolio performance in a controlled and quantifiable manner.

Disclosures

Coin Definitions

- **Ethereum (ETH)** is a decentralized, open-source blockchain with smart contract functionality. Ether is the native cryptocurrency of the platform. Amongst cryptocurrencies, Ether is second only to Bitcoin in market capitalization.
- **Bitcoin (BTC)** is a decentralized digital currency, without a central bank or single administrator, that can be sent from user to user on the peer-to-peer bitcoin network without the need for intermediaries.

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Index performance is not representative of fund performance. It is not possible to invest directly in an index.

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Digital asset prices are highly volatile, and the value of digital assets, and Web3 companies, can rise or fall dramatically and quickly. If their value goes down, there's no guarantee that it will rise again. As a result, there is a significant risk of loss of your entire principal investment.

Digital assets are not generally backed or supported by any government or central bank and are not covered by FDIC or SIPC insurance. Accounts at digital asset custodians and exchanges are not protected by SPIC and are not FDIC insured. Furthermore, markets and exchanges for digital assets are not regulated with the same controls or customer protections available in traditional equity, option, futures, or foreign exchange investing.

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Web3 companies include but are not limited to, companies that involve the development, innovation, and/or utilization of blockchain, digital assets, or crypto technologies.

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