betashares

Bitcoin's role in a traditional portfolio

2025

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Introduction

Betashares Capital Limited (ABN 78 139 566 868, AFS Licence 341181) (Betashares) is the issuer of this paper.

Adoption of bitcoin as an investment asset has grown substantially globally as it has become more mainstream among both retail and institutional investors.

With this in mind, Betashares has produced this research paper to provide Australian investors with insights into how a small allocation to bitcoin could potentially shape absolute and risk-adjusted returns when combined with what might be considered a typical Australian multi asset portfolio.

The research for this paper has been conducted by Bitwise Asset Management, the largest crypto index fund manager in the US.

Please note the following key considerations with regards to the findings in this paper:

Very small allocation only. The paper considers key questions when allocating to bitcoin: minimum holding period, rebalancing frequency and allocation size. In relation to allocation size, it is important to note that while the research considers bitcoin allocations of up to 10%, it indicates that risk-return factors do not support allocations above 5%. This is consistent with Betashares' own target market assessment for its cryptocurrency funds. An investment in bitcoin should be considered extremely high risk and should be considered only by informed investors seeking a very small allocation (5% or less) to an extremely high volatility investment.

Illustrative only. The research is based on a hypothetical portfolio with an allocation of 70% equities (35% Australian equities, 35% international equities) and 30% Australian bonds. This hypothetical example is provided for illustrative purposes only and is not a recommendation to invest or adopt any investment strategy. A 70/30 portfolio is necessarily limited to showing a single asset allocation which may not be suitable for all investors' risk-return profiles. Investing in bitcoin carries an extremely high level of risk and a portfolio allocation to bitcoin is not suitable for all investors. It is possible that materially different outcomes might have been evident had research considered portfolios with different asset allocations.

Fees and costs not taken into account. The performance of equity and bond portfolio allocations is based on returns of the indices noted in the paper and does not take into account any fees or costs involved in constructing and managing a portfolio, e.g. transaction costs (including brokerage fees), management costs, and rebalancing costs. Such costs would reduce returns. Portfolio returns shown also do not account for taxes borne by investors.

Simulated performance. Indices are used to illustrate asset class performance. You cannot invest directly in an index. Simulated performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading, are based on assumptions, and are produced with the benefit of hindsight.

Bitcoin risk. Investing in bitcoin should only be made by investors who (i) fully understand the features and risks of bitcoin or after consulting a professional financial adviser, and (ii) who have an extremely high tolerance for risk and the capacity to absorb a rapid loss of some or all of their investment. Bitcoin is subject to certain risks not associated with traditional asset classes such as equities. It is supported by new technologies and traded and valued in largely unregulated markets. Bitcoin is not backed by any government or central bank and could have little or no value in the future.

Not investment advice. The paper is educational in nature and is not intended to be, and should not be relied on as, investment advice. The information is of a general nature only and does not take into account any person's financial objectives, situation or needs. Investors should consider its appropriateness taking into account such factors.

Past performance. Past performance, actual or simulated, is not indicative of future performance. Actual outcomes may differ materially from historical research outcomes and those contemplated in any opinions, estimates or other forward-looking statements given in this paper.

Future results are inherently uncertain. This report may include opinions, views, estimates, projections, assumptions and other forward looking statements which are, by their very nature, subject to various risks and uncertainties. Actual events or results may differ materially, positively or negatively, from those reflected or contemplated in such forward-looking statements. Opinions, projections and other forward looking statements are subject to change without notice.

No liability. To the extent permitted by law Betashares accepts no liability for any errors or omissions in, or loss from reliance on the information in, this Report.

Contents

I Executive Summary

This paper examines the case for adding bitcoin to a diversified portfolio of stocks and bonds. Specifically, we consider the impact that different allocations to bitcoin would have had on a traditional portfolio consisting of 70% equities and 30% bonds under a wide variety of market regimes from January 2015 through December 2024. Notably, this timeframe includes the substantial volatility that bitcoin experienced in 2022.

The findings are that bitcoin would have contributed positively to a diversified portfolio's returns in 82% of one-year periods, 94% of two-year periods, and 100% of three-year periods since 2015, assuming quarterly rebalancing.

In addition, the magnitude of that positive impact has been significant: In the median case, and assuming quarterly rebalancing, a 5% allocation to bitcoin would have boosted the three-year risk-adjusted return of a traditional 70/30 portfolio by 23 percentage points.

This paper builds on a significant body of literature examining bitcoin's influence on portfolio returns. One common criticism of prior papers is that the authors cherry-pick specific time periods, rebalancing strategies, or allocations to highlight positive results. This prompts a question that lingers in the back of many savvy investors' minds: "What if I didn't allocate exactly this way?"

This paper aims to address that concern by taking a comprehensive approach to the analysis. Specifically, it shows how key portfolio metrics would have fared by considering the following:

— **Extensive price data** running across multiple bear and bull markets, starting on January 1, 2015, and ending on December 31, 2024.

— **All holding periods greater than one year.** Using rolling-period analyses, the paper examines every possible one-, two-, and three-year holding period within that history.

— **A range of potential bitcoin allocations**, from 0% to 10% of the portfolio.

— **Multiple rebalancing frequencies**, including monthly, quarterly, annual, and no rebalancing.

Of course, there is no guarantee that the relationship between a bitcoin allocation and portfolio performance metrics will persist going forward; past performance is no guarantee of future results. Still, the study's findings suggest bitcoin may have a powerful role to play in many diversified portfolios.

II Methodology

This paper examines the impact of adding a bitcoin allocation to a traditional diversified portfolio of stocks and bonds, i.e., a traditional 70/30 portfolio. Specifically, the portfolio we examined features a 30% allocation to the Bloomberg AusBond Composite Index , a 35% allocation to the MSCI World ex Australian Index (AUD), and a 35% allocation to the S&P/ASX 200 Index.

In an effort to adopt the most conservative approach, our study uses bitcoin's price return and does not add in the value of hard forks or airdrops. In practice, an investor allocating to bitcoin could have achieved a meaningfully higher total return by capturing the value of these distributions during the study period.

The paper focuses on the 10-year period between January 1, 2015, and December 31, 2024. The decision to exclude the period before 2014 was made to better represent the experience of professional asset allocators in the U.S., as the first investable bitcoin fund launched in late 2013. In addition, removing the first years of bitcoin's existence makes the analysis more conservative because bitcoin's price appreciated substantially before 2014, returning 1,537,795% from July 17, 2010, through December 31, 2013.

Importantly, the paper takes advantage of both point-in-time and rolling-period analyses. We find rolling analyses useful because they eliminate concerns about cherry-picking time periods and provide a fuller view of the frequency and magnitude of the impact a bitcoin allocation can have on a portfolio under different market regimes. For rolling analyses, instead of looking at arbitrary start and end dates, we fix a certain holding period window (e.g., one year, two years, or three years) and analyze all possible holding periods of that length in the available data.

Beyond cumulative and annualized returns, this paper also evaluates the risk-adjusted impact on returns by examining key portfolio performance metrics including Sharpe ratio, volatility, and maximum drawdown. We used a risk-free rate of 2.63% for our analysis, based on yields for the Australian 10-year Government Bond.

All returns calculated in this analysis are daily and normalized for official market trading days. Bitcoin's returns during weekends or market holidays are accounted for on the following trading session. All annualized calculations are computed using 261-day periods.

III Bitcoin's Impact on a Traditional 70/30 Portfolio

Impact on Returns

We begin this study by examining the returns of a traditional 70/30 portfolio without a bitcoin allocation. During the study period, this portfolio returned 123.50% on a cumulative basis, assuming quarterly rebalancing, which translates to an annualized return of 8.37% per year.

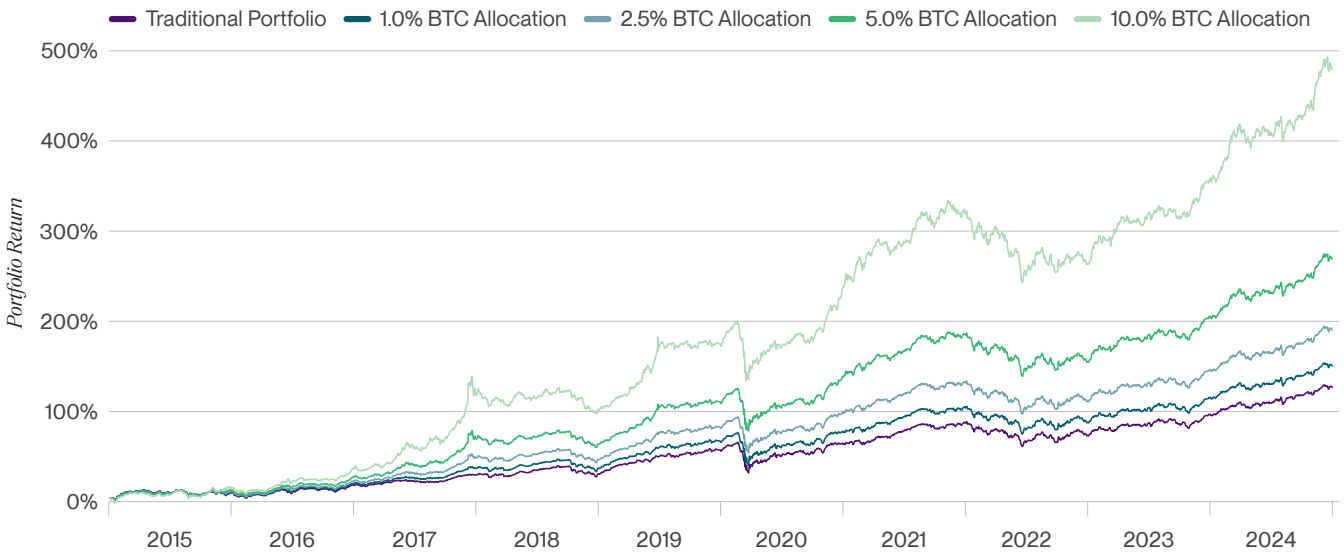
Figure 1 and Table 1 show that a modest allocation to bitcoin would have significantly improved these returns.

For instance, adding a 2.5% bitcoin allocation with quarterly rebalancing would have improved the cumulative return of the portfolio to 187.81% or 11.15% p.a. This would have been achieved without major changes in either the portfolio's volatility (8.68% p.a. with bitcoin versus 8.36% p.a. without) or its maximum drawdown (21.18% with bitcoin compared to 21.02% without). The portfolio's Sharpe ratio, which measures excess returns per unit of risk (measured as standard deviation), would have improved by 43%.

Naturally, bitcoin's portfolio impact scales with the size of the allocation: A 5% allocation to bitcoin would have boosted the cumulative return of the portfolio to 266.81% (or 13.88% p.a.), more than doubling the total return of the traditional portfolio.

Figure 1:

Traditional Portfolio With and Without Quarterly Rebalanced Bitcoin Allocations



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

Past performance does not predict or guarantee future results. Nothing contained herein is intended to predict the performance of any investment. There can be no assurance that actual outcomes will match the assumptions or that actual returns will match any expected returns. Historical performance of sample portfolios has been generated and maximized with the benefit of hindsight. The returns do not represent the returns of an actual account and do not include the fees and expenses associated with buying, selling, and holding funds or crypto assets. Performance information is provided for informational purposes only.

Table 1:

Portfolio Performance Metrics (Assuming Quarterly Rebalancing)

Portfolio	Cumulative Return	Annualized Return	Volatility (Annualized Std. Dev.)	Sharpe Ratio	Maximum Drawdown
Traditional 70/30 Portfolio	123.50%	8.37%	8.36%	0.687	21.02%
Traditional Portfolio + 1.0% Bitcoin	147.61%	9.49%	8.42%	0.815	21.09%
Traditional Portfolio + 2.5% Bitcoin	187.81%	11.15%	8.68%	0.982	21.18%
Traditional Portfolio + 5.0% Bitcoin	266.81%	13.88%	9.51%	1.183	21.42%
Traditional Portfolio + 10.0% Bitcoin	479.13%	19.20%	12.04%	1.376	22.55%

Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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It is fair to note, however, that the price of bitcoin rose sharply during this period, from $385 at the start of 2015 to $150,926 on December 31, 2024. A natural follow-up question is: "How would allocating to bitcoin have impacted a portfolio during more variable market conditions?"

Generalizing Bitcoin's Portfolio Impact Through Rolling Analyses

It is possible to have a fuller understanding of the impact of adding bitcoin to the traditional portfolio by looking at rolling return periods rather than picking arbitrary start and end dates.

First, we will consider the impact of a 5% bitcoin allocation using a three-year rolling period and quarterly rebalancing. Later, we will analyze the impact of different allocation sizes, holding periods, and rebalancing frequencies.

The results of this analysis are remarkable, showing that bitcoin would have contributed positively to the cumulative three-year return of a traditional portfolio for every possible start date since 2015. The median, maximum, and minimum contribution are shown in Table 2.

Table 2:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Cumulative Returns, Assuming Quarterly Rebalancing)

Maximum Contribution	Median Contribution	Minimum Contribution	Frequency of Positive Contributions	Frequency of Negative Contributions
46.19 pp	22.99 pp	3.23 pp	100.00%	0.00%

Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024. Percentage points abbreviated as "pp."

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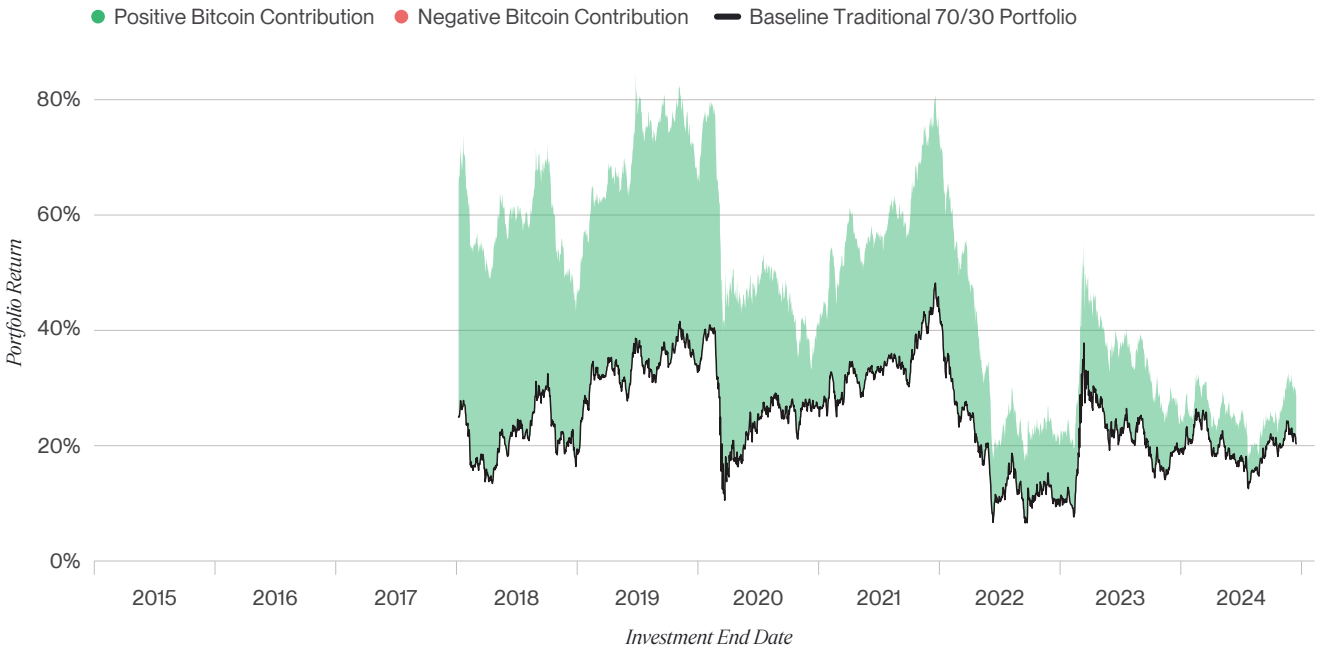
Figure 2 shows the impact visually, capturing all possible three-year holding periods during our study. To interpret the chart, consider that the first data point on the left shows the returns for the three-year period ending January 1, 2018, while the last data point on the right shows the returns for the three-year period ending December 31, 2024. The other data points in between represent the cumulative returns for every other three-year window in this study. The black line represents the three-year rolling returns of the traditional portfolio, while the green shade shows the positive contribution that a bitcoin allocation delivered for each three-year period.

Figure 2:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Cumulative Returns, Assuming Quarterly Rebalancing)



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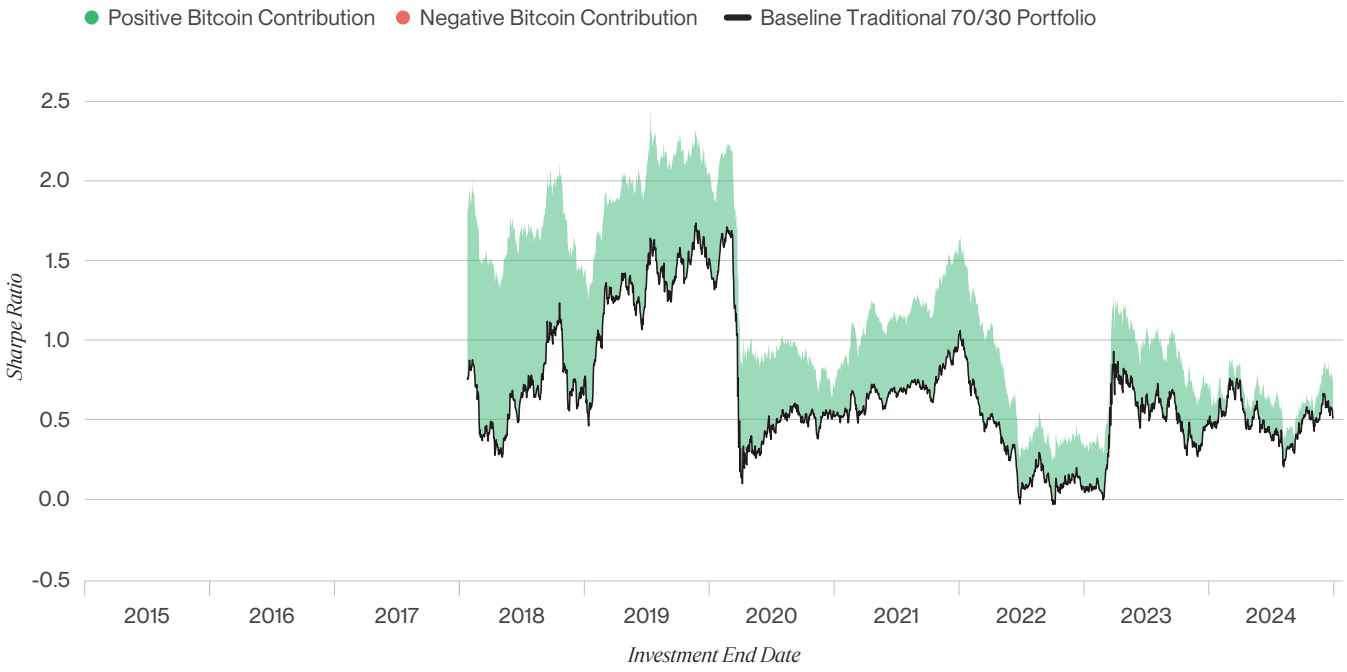
Although the size of the impact ebbs and flows throughout the study period, the median contribution is 23 percentage points, which is notable for a 5% allocation.

Importantly, the positive contribution from a bitcoin allocation did not come at the price of greater volatility. Figure 3 shows the improvement to a traditional portfolio's Sharpe ratio during these same rolling three-year windows. As with cumulative returns, a bitcoin allocation had a positive impact on the traditional portfolio's overall Sharpe ratio for every possible three-year period in our study.

Figure 3:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Sharpe Ratio, Assuming Quarterly Rebalancing)



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When considering these investing parameters, on a historical basis a bitcoin allocation has consistently enhanced a 70/30 diversified portfolio.

IV The Three Key Questions When Allocating to Bitcoin

Investors allocating to bitcoin must answer three critical questions:

01	What is the minimum acceptable holding period for a bitcoin allocation?
02	What is the best rebalancing frequency for a bitcoin allocation?
03	How much bitcoin should you add to a portfolio?

We have evaluated each of these questions separately to help investors make the best possible decisions in light of the available historical data.

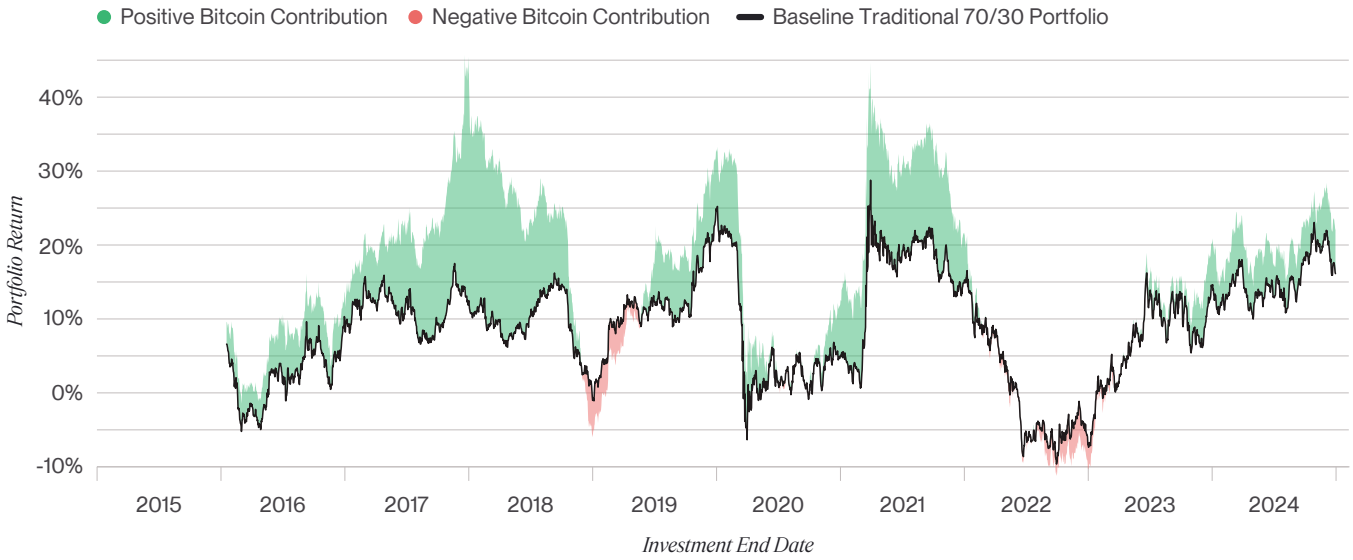
Question 1: What is the Minimum Acceptable Holding Period for a Bitcoin Allocation?

To examine the most appropriate holding period, we reran the rolling cumulative return and Sharpe ratio metrics for holding periods varying from one to three years, using a 5% bitcoin allocation and quarterly rebalancing as the base case.

Figures 4-6 below show that impact.

Figure 4:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (1-Year Rolling Cumulative Returns, Assuming Quarterly Rebalancing)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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Figure 5:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (2-Year Rolling Cumulative Returns, Assuming Quarterly Rebalancing)

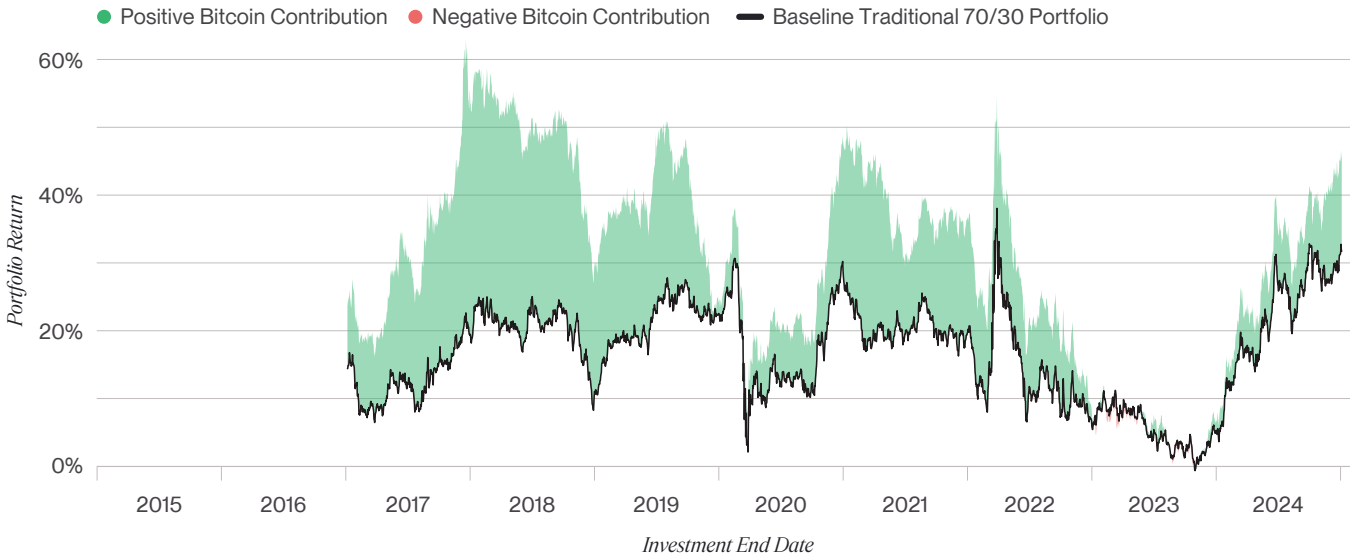

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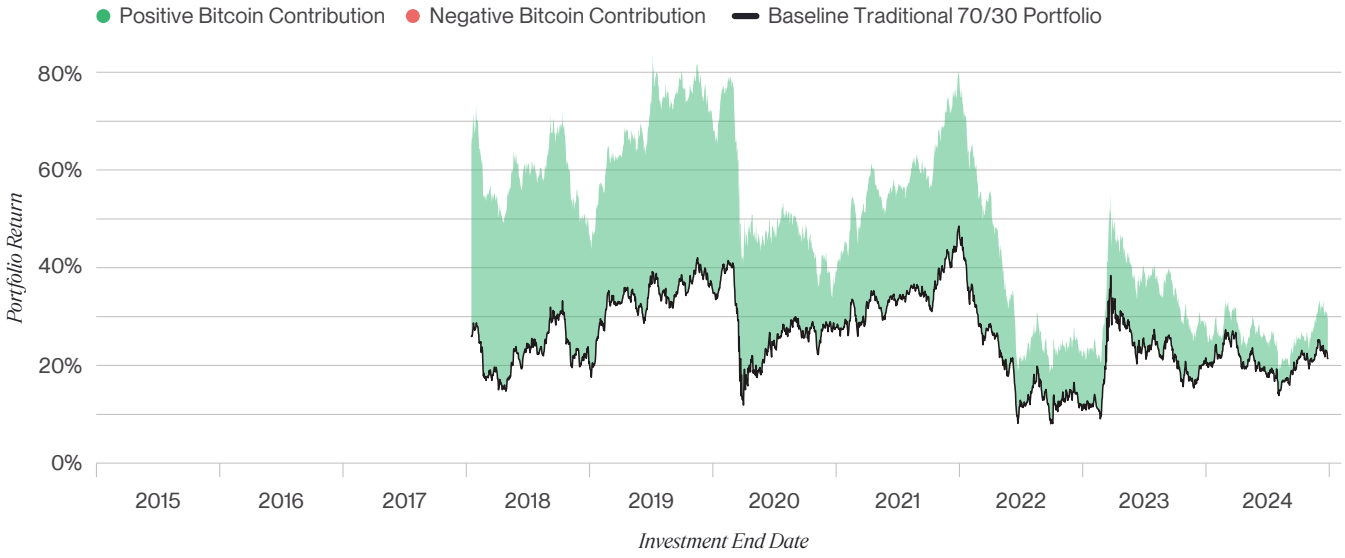
Figure 6:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Cumulative Returns, Assuming Quarterly Rebalancing)



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This analysis shows that bitcoin's generally positive contribution to a portfolio's returns remained strong across various holding periods. Specifically, bitcoin had a positive impact in 82% of the one-year periods we examined, 94% of the two-year periods, and 100% of the three-year periods.

It is worth noting that, even in the one-year study, where we see the highest rate of negative contributions, there was a positive skew in the extreme outcomes: The best-case scenario contributed 33.47 percentage points to returns, while the worst-case contribution detracted 6.09 percentage points from returns. The median case added 5.34 percentage points to returns.

The contribution to the traditional portfolio's Sharpe ratio was similar, as shown in Table 3. Here, the case is even stronger, with bitcoin contributing to an improved Sharpe ratio in 82% of one-year periods, 91% of two-year periods, and 100% of three-year periods.

Generally speaking, the longer the holding period, the better the results.

Table 3:

Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio Across Different Holding Periods (Assuming Quarterly Rebalancing)

	Change in Cumulative Returns					*Change in Sharpe Ratio*				
	Max	Med	Min	Win Rate	Loss Rate	Max	Med	Min	Win Rate	Loss Rate
1 YR	33.47 pp	5.34 pp	-6.09 pp	81.69%	18.31%	2.76	0.47	-0.85	82.12%	17.88%
2 YR	41.45 pp	12.40 pp	-2.95 pp	94.11%	5.89%	1.82	0.47	-0.27	91.38%	8.62%
3 YR	46.19 pp	22.99 pp	3.23 pp	100.00%	0.00%	1.16	0.46	0.05	100.00%	0.00%

Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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Question 2: What is the Best Rebalancing Frequency for a Bitcoin Allocation?

The decision on how frequently to rebalance a portfolio carries extra weight when dealing with an asset that displays bitcoin's historical level of volatility. Without rebalancing, even a small allocation to bitcoin can grow to dominate a portfolio's risk/return characteristics.

To address this issue, we compared the cumulative and risk-adjusted returns of a traditional portfolio featuring a bitcoin allocation under four different rebalancing strategies: monthly, quarterly, and annual rebalancing, along with no rebalancing.

Figure 7 and Table 4 below highlight the substantial impact that a rebalancing strategy can have on a portfolio. As might be expected with a highly volatile but upwardly biased asset, lower rebalancing frequencies generally led to higher volatility, higher cumulative returns, and significantly higher maximum drawdowns. Conversely, more frequent rebalancing strategies dampened both the volatility and return impact.

Figure 7:

Impact of Different Rebalancing Strategies on a Traditional 70/30 Portfolio With a 5% Bitcoin Allocation

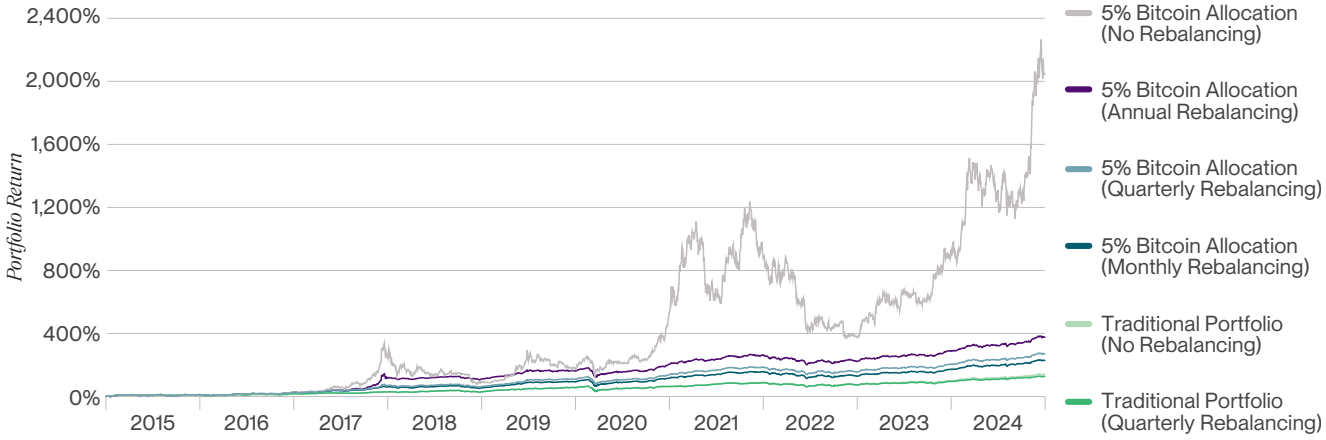

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Table 4:

Portfolio Performance Metrics

Portfolio	Cumulative Return	Annualized Return	Volatility (Annualized Std. Dev.)	Sharpe Ratio	Sortino Ratio	Maximum Drawdown
Traditional 70/30 Portfolio (No Rebalancing)	136.07%	8.97%	8.98%	0.706	0.061	22.38%
Traditional 70/30 Portfolio (Quarterly Rebalancing)	123.50%	8.37%	8.36%	0.687	0.059	21.02%
5% Bitcoin Allocation (No Rebalancing)	2041.44%	35.87%	39.69%	0.837	0.084	64.77%
5% Bitcoin Allocation (Annual Rebalancing)	373.00%	16.82%	11.27%	1.259	0.113	21.42%
5% Bitcoin Allocation (Quarterly Rebalancing)	266.81%	13.88%	9.51%	1.184	0.100	21.42%
5% Bitcoin Allocation (Monthly Rebalancing)	225.51%	12.53%	9.12%	1.086	0.091	21.50%

Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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There is a clear relationship between cumulative returns and volatility. The bitcoin allocation with no rebalancing led to a jump in annualized portfolio volatility compared to the traditional 70/30 portfolio with no rebalancing (from 8.98% to 39.69%) and a large uptick in maximum drawdown (from 22.38% to 64.77%). Adding any rebalancing strategy, however—monthly, quarterly, or annual—significantly reduced the volatility and maximum drawdown compared to allocating to bitcoin without rebalancing.

It is notable that the strategy with no rebalancing, while delivering the highest absolute return of the various bitcoin-enhanced portfolios, delivered the lowest Sharpe ratio. This suggests that investors pay a high cost in risk to gain this added return. As Figures 8 to 11 below show, incorporating a rebalancing strategy may both enhance the portfolio's efficiency and boost risk-adjusted returns.

Figure 8:

No Rebalancing – Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Sharpe Ratio)

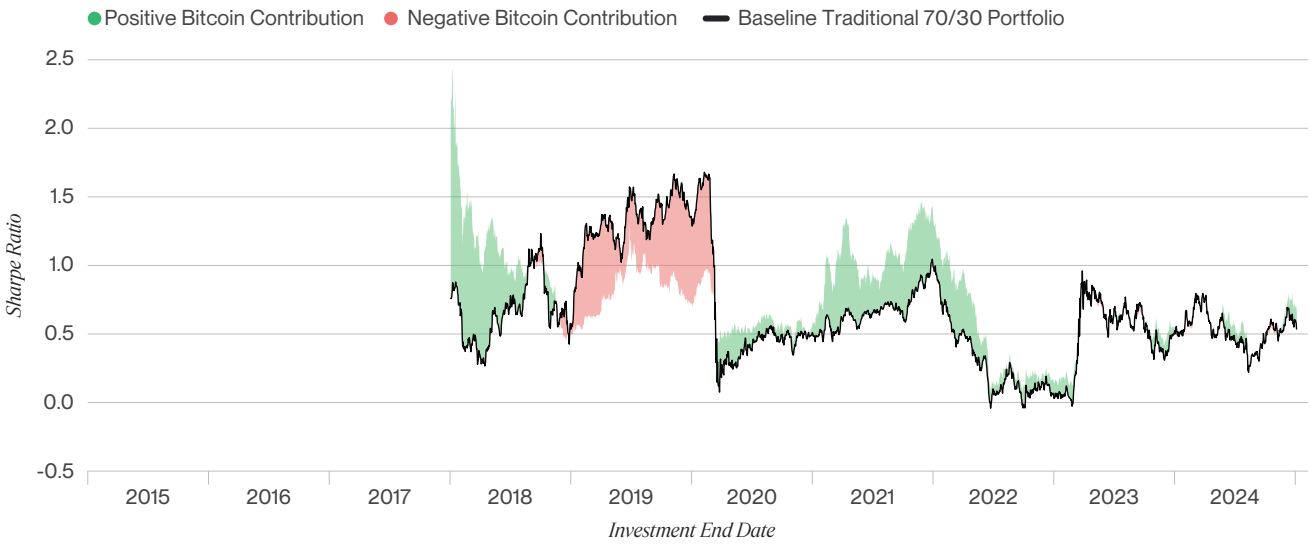

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Figure 9:

Annual Rebalancing – Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Sharpe Ratio)

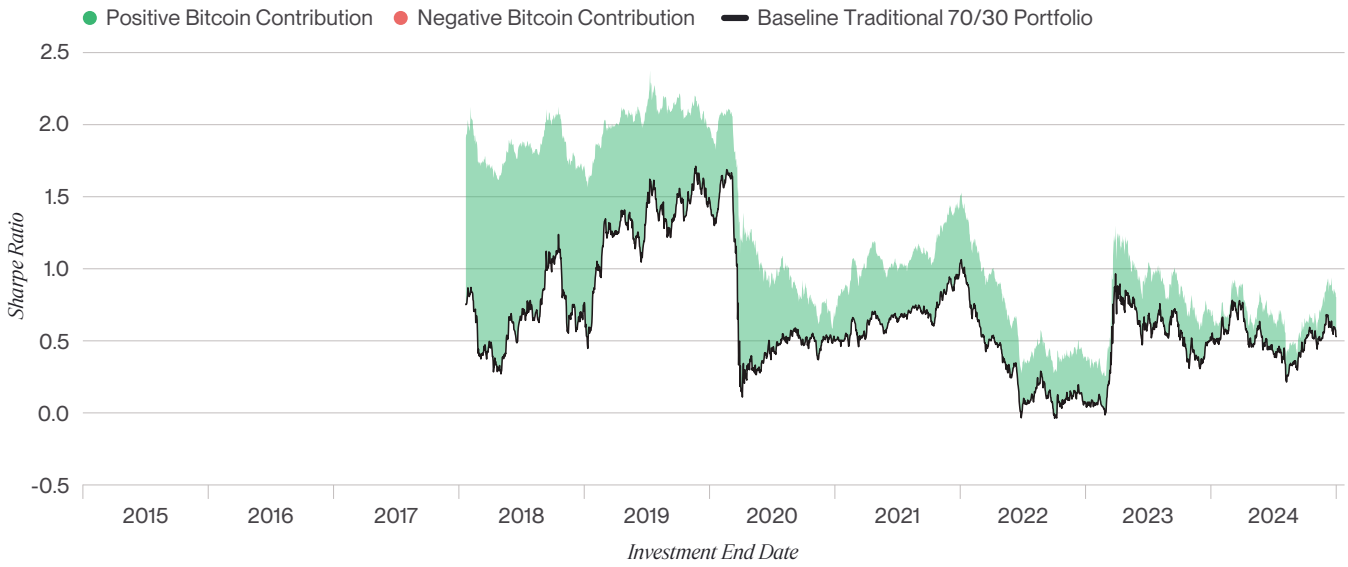

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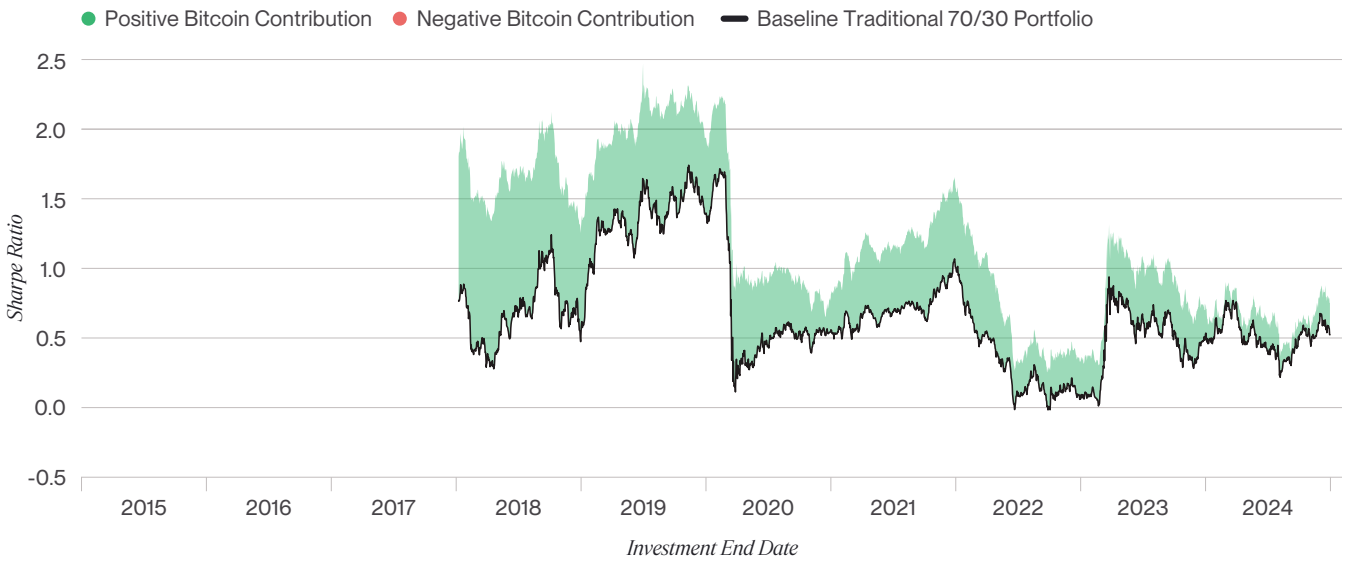
Figure 10:

Quarterly Rebalancing – Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Sharpe Ratio)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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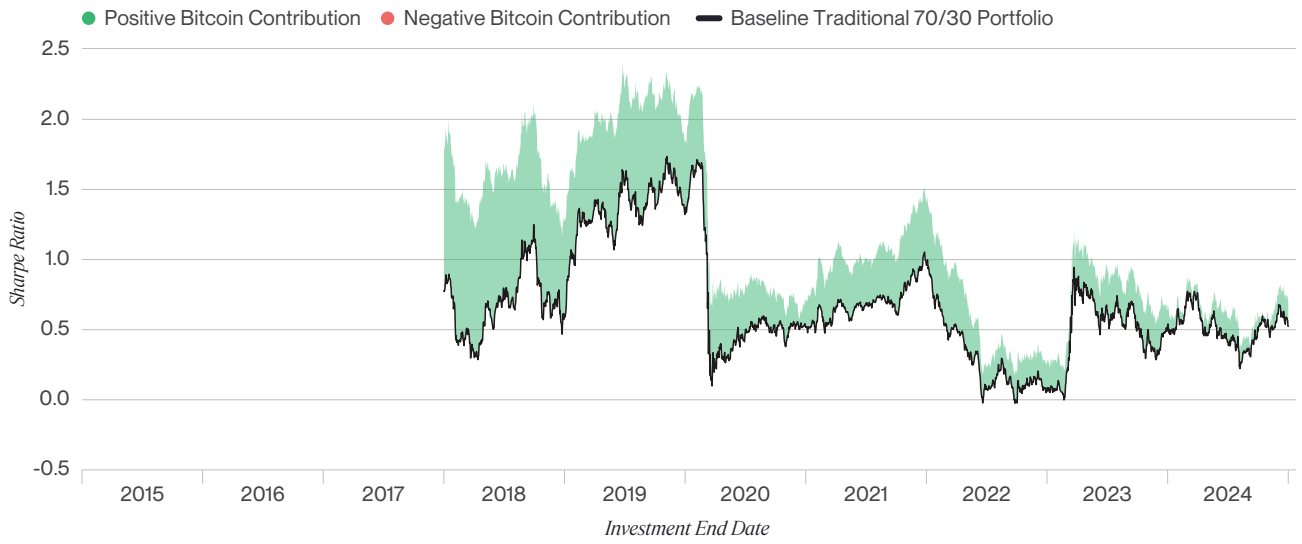
Figure 11:

Monthly Rebalancing – Contribution of 5% Bitcoin Allocation to a Traditional 70/30 Portfolio (3-Year Rolling Sharpe Ratio)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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Question 3: How Much Bitcoin Should You Add to a Portfolio?

Perhaps the most important question when allocating to crypto is: How big of a position should you have?

The four figures below address that question.

The data shows the impact that allocating between 0% and 10% of a portfolio to bitcoin over a three-year period would have had on cumulative return, standard deviation, Sharpe ratio, and maximum drawdown, respectively.

The figures are informationally dense and bear explanation.

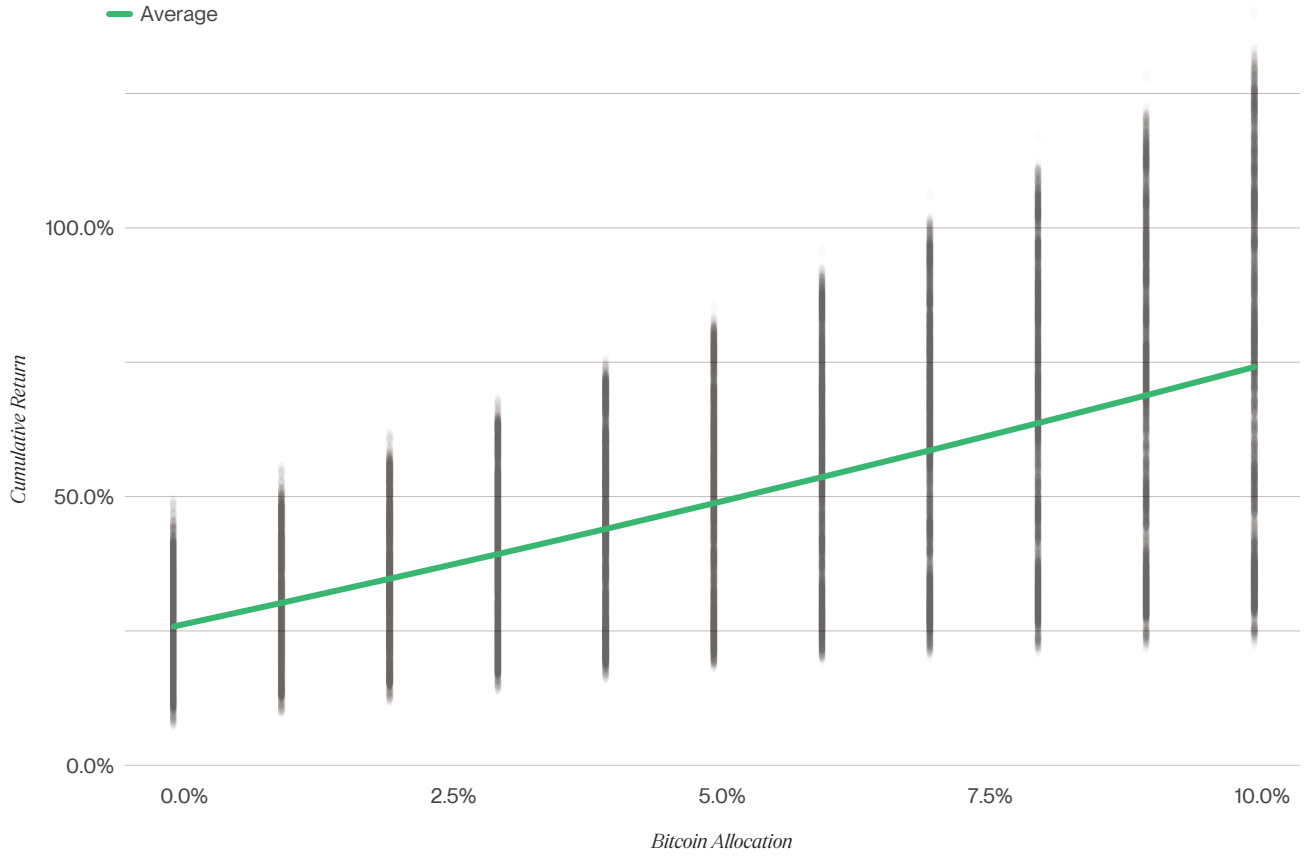
Each vertical dotted line represents all of the three-year windows between January 1, 2015, and December 31, 2024, for a given bitcoin allocation. Therefore, each vertical line contains 2,557 dots, or one for each three-year period; darker regions indicate heavier concentrations of dots. The green line indicates the average for each bitcoin allocation size.

The leftmost vertical dotted line shows the traditional portfolio, i.e., with a bitcoin allocation of 0%, and the vertical lines to the right represent bitcoin allocations increasing in 1% increments up to 10%. Bear in mind that there is no chronological relationship among the lines as we move to the left or to the right; different lines represent different bitcoin allocations only.

As seen in Figure 12, the cumulative return tells a clear story: The more bitcoin the better. As the green line shows, there is a nearly linear relationship between the amount of bitcoin added to the portfolio and the cumulative return.

Figure 12:

Three-Year Rolling Cumulative Return by Bitcoin Allocation (Assuming Quarterly Rebalancing)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024

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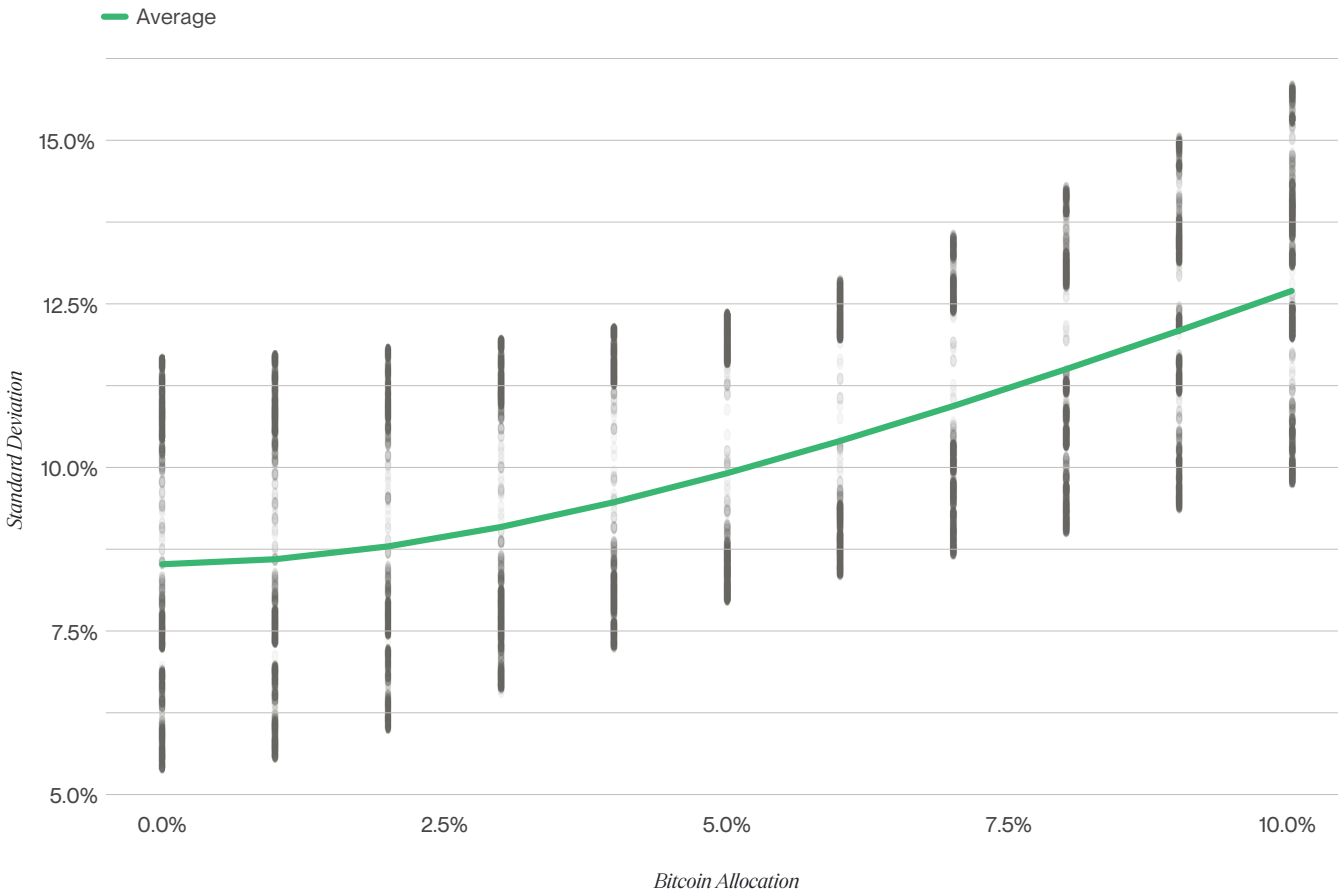
That return, however, comes with the potential drawback of added volatility.

Figure 13 shows the impact of higher bitcoin allocations on standard deviation, a common measure of portfolio volatility. Clearly, as the bitcoin allocation increases, the portfolio's volatility does as well.

Interestingly, however, the relationship here is not linear; the green line has a distinctive swoosh-like shape. This suggests that small allocations to bitcoin—roughly between 0.5% and 2.0%—have a minimal impact on portfolio volatility, but the impact increases quickly as the size of the allocation goes up.

Figure 13:

Three-Year Rolling Standard Deviation by Bitcoin Allocation (Assuming Quarterly Rebalancing)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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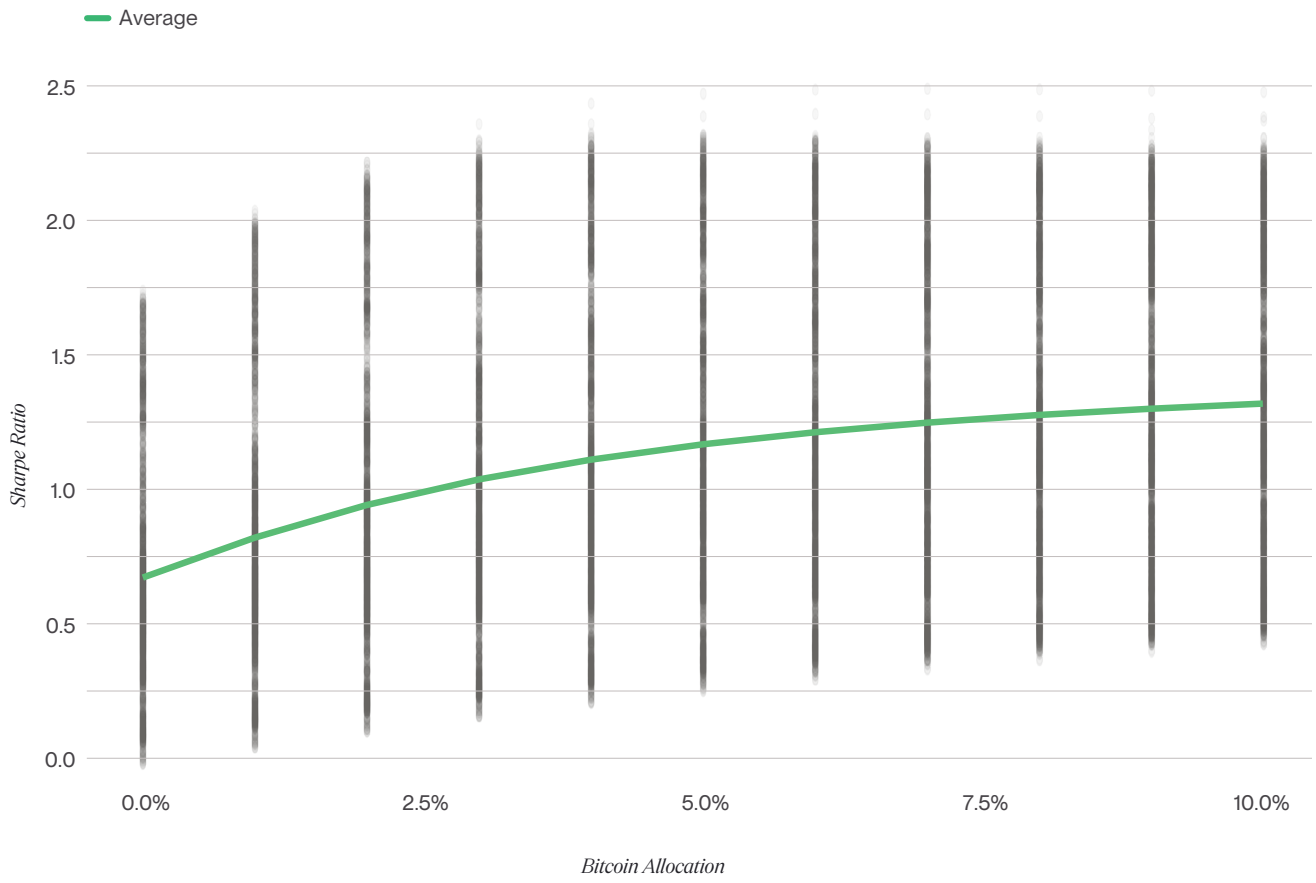
Figure 14 combines the data from Figures 12 and 13 by examining Sharpe ratios. Like the standard deviation figure, this one has a distinct shape, rising sharply at first and then flattening out as the size of the portfolio allocation increases. The chart shows that adding bitcoin to a portfolio tends to increase risk-adjusted returns, but that the incremental benefit of adding more bitcoin to a portfolio starts to stabilize at about a 5% bitcoin allocation.

Figure 14:

Three-Year Rolling Sharpe Ratio by Bitcoin Allocation (Assuming Quarterly Rebalancing)



Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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Figure 15 looks at the impact that different allocations to bitcoin has on a portfolio's maximum drawdown. The shape of the green line's curve here is notable. It shows that, on average, adding bitcoin to a portfolio has little impact on the portfolio's maximum drawdown over three-year periods for allocations between 0.5% and 3%. This fact may surprise some observers, as bitcoin itself is very volatile. But bitcoin's returns are not typically correlated with stocks or bonds, which can blunt the impact of overall volatility.

Things change at 5% or higher, however: The impact on maximum drawdown begins to increase rapidly. Given that maximum drawdowns can have a significant impact, investors may be most comfortable with a bitcoin allocation of 5% or less.

Figure 15:

Three-Year Rolling Maximum Drawdown by Bitcoin Allocation (Assuming Quarterly Rebalancing)

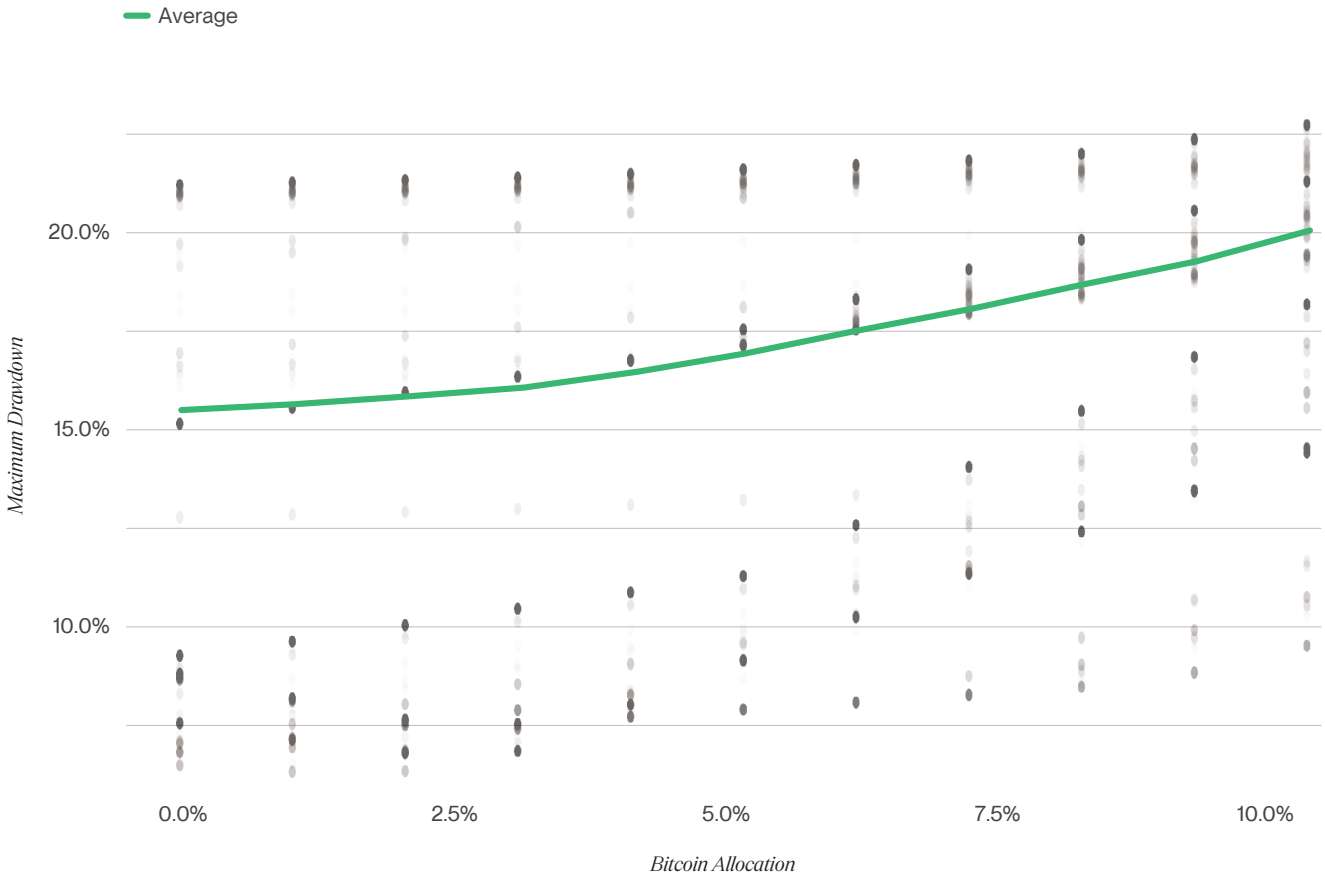

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Table 5 below summarizes the impact of different bitcoin allocations on all four of the key portfolio metrics over the study period.

Table 5:

Portfolio Performance Metrics by Bitcoin Allocation (Assuming Quarterly Rebalancing)

Bitcoin Allocation	*Cumulative Return*			*Sharpe Ratio*			*Standard Deviation*			*Maximum Drawdown*		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
0%	-1.54%	21.04%	48.65%	-85.205	0.718	9.384	0.03%	8.33%	11.65%	0.00%	12.99%	21.02%
1%	-1.87%	24.49%	54.83%	-22.396	0.849	8.090	0.24%	8.39%	11.71%	0.02%	12.97%	21.09%
2%	-2.20%	28.02%	61.17%	-16.365	0.944	6.999	0.50%	8.54%	11.80%	0.04%	12.99%	21.15%
3%	-2.53%	31.63%	67.65%	-14.387	1.018	6.080	0.76%	8.79%	11.94%	0.07%	13.13%	21.21%
4%	-2.87%	35.31%	74.94%	-13.344	1.075	5.301	1.03%	9.11%	12.12%	0.09%	13.40%	21.31%
5%	-3.20%	39.07%	84.81%	-12.664	1.119	4.724	1.29%	9.49%	12.34%	0.11%	13.77%	21.43%
6%	-3.63%	42.90%	95.01%	-12.165	1.153	4.339	1.55%	9.93%	12.86%	0.14%	14.25%	21.55%
7%	-4.08%	46.81%	105.56%	-11.770	1.178	3.974	1.82%	10.40%	13.55%	0.16%	14.77%	21.66%
8%	-4.53%	50.80%	116.45%	-11.439	1.198	3.633	2.08%	10.91%	14.32%	0.18%	15.30%	21.89%
9%	-4.98%	54.86%	127.69%	-11.152	1.214	3.317	2.34%	11.45%	15.30%	0.21%	15.89%	22.27%
10%	-5.44%	59.01%	139.28%	-10.897	1.226	3.028	2.61%	12.00%	16.37%	0.23%	16.47%	22.64%

Source: Bitwise Asset Management with data from Bloomberg. Data from January 1, 2015 to December 31, 2024.

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V Conclusion

In this study, we evaluated the effects of adding bitcoin to a traditional 70/30 portfolio consisting of stocks and bonds. Our analysis encompassed a substantial set of data from January 2015 to December 2024, which included multiple bull and bear market cycles for bitcoin—including the sharp pullback in 2022. To ensure objective evaluation, we employed rolling-period analyses to mitigate potential data-selection bias. We also explored various rebalancing strategies, allocation sizes, and holding periods.

The results show that, historically, adding bitcoin to a portfolio would have boosted both absolute and risk-adjusted returns for all three-year holding periods since 2015, assuming an appropriate rebalancing strategy was in place.

The study highlights three key factors investors should consider when making a bitcoin allocation: time frame, rebalancing frequency, and position size. These are individual decisions for each investor, but we note some interesting historical patterns:

— **Time Frame: As holding periods increase above two years, the historical record of positive contributions has approached 100%.** Bitcoin is a volatile asset, and its short-term outlook is extremely difficult to predict. It has experienced multiple 50%-plus drawdowns in its history and may experience more in the future. Still, allocating to bitcoin has improved a portfolio's cumulative and risk-adjusted returns in 100% of three-year periods, 94% of two-year periods, and 82% of one-year periods since 2015.

— **Rebalancing Frequency: Adding an asset with a significant degree of volatility in a portfolio makes rebalancing critical.** Generally, a quarterly rebalancing strategy has delivered a healthy balance between capturing bitcoin's asymmetric upside returns and keeping drawdowns under control.

— **Position Sizing: Maximum drawdowns are perhaps the foremost factor for investors to consider when deciding how much bitcoin to add to their portfolio.** Over three-year holding periods, adding larger and larger allocations to bitcoin would have monotonically increased a diversified portfolio's cumulative returns. But our study showed that the impact on Sharpe ratios generally started to level off at the 5% allocation level. We also found that the impact on maximum drawdowns began to increase rapidly at allocations of 5% or more. Investors may therefore be most comfortable with an allocation of 5% or less.

The empirical evidence from this study underscores a salient observation: For a traditional portfolio of stocks and bonds, bitcoin has historically been an effective tool to enhance risk-adjusted returns. Of course, past performance is not indicative of future results.

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