



Quants search for way to size crypto bets

Standard models say as much as 4% of a diversified portfolio could go into digital assets

Mauro Cesa

19 Oct 2022

NEED TO KNOW

- Asset allocation models suggest that bitcoin could account for as much as 3% to 4% of a diversified portfolio.
- However, the increasing correlation between bitcoin and the S&P 500 is eroding the cryptocurrency's diversification benefits.
- Not investing in crypto does not mean having zero exposure to it.
- Star investors, such as Warren Buffett and Ray Dalio, still have diverging views on the merits of the asset class.

Investors wanting to know how much to invest in cryptocurrency will get only limited guidance from star investors.

Ray Dalio, Bridgewater Associates' founder and CIO, says bitcoin and ether contribute to a portfolio's diversification. Thomas Peterffy, founder of Interactive Brokers, owns some cryptocurrencies but says he is sceptical about their long-term value. And in April, Warren Buffett told a Berkshire Hathaway shareholders meeting that he would not buy bitcoin at any price because it does not produce anything.

Could mathematics be more helpful? Some well-known quants believe it could – up to a point. They have been using traditional asset allocation models to address the question of how to size crypto bets and have come up with some surprising results.

A [research paper](#) by BlackRock says the optimal allocation to [bitcoin](#) in a multi-asset portfolio should be as much as 3%. Separate analysis by Artur Sepp, head of systematic solutions and portfolio construction at Signum Bank in Zurich, recommends up to 4.1%, depending on the type of model used in the calculation.

Sepp concludes that “adding bitcoin, and more generally, a diversified basket of [cryptocurrencies](#), to the investible universe of broad portfolios may be beneficial for both alternative portfolios and blended portfolios”.

Potential to coin it in

BlackRock, Fidelity and [State Street](#) are among those that have turned their attention in recent years to crypto projects such as investment trusts, indexes and custody offerings, as the sector’s institutionalisation has continued. The small chance of a large upside has been one of the key reasons for this. In addition, bitcoin was for a long time uncorrelated to major indexes and, like many cryptocurrencies, was therefore seen as a valuable contributor to diversification.

The authors of the BlackRock paper – Andrew Ang, Tom Morris and Raffaele Savi – modelled the cryptocurrency’s statistical properties with a mixture of normal distributions. This led them to posit two types of regime: one with high probability and relatively low expected return; and one with very low probability and very high expected return. They call the latter the “bliss” regime, which they say is drawn from the extreme returns that occurred primarily during the first half of bitcoin’s existence.

BlackRock’s quants suggest that the possibility of extremely positive returns justifies a significant allocation to the cryptocurrency. A 0.5% probability of a bliss regime materialising would justify a 2% allocation, while a 1.9% probability would justify an allocation of 3%.

At Signum, Sepp approached the asset allocation problem by developing [four different methods](#) that extend BlackRock’s mixture of normal distributions. Two of the methods are risk-only – the asset selection is made according to an equal risk contribution approach or a maximum diversification criterion. The other two are risk/return methods: one maximises the [Sharpe ratio](#), while the other maximises a risk-aversion function.

Sepp applied the methods to a portfolio of alternative assets and to a balanced portfolio, with and without bitcoin, to compare the results and gauge the cryptocurrency's contribution.

In the equal-risk construction, Sepp calculated that bitcoin should account for 2% of a portfolio of alternative assets and 0.9% of a balanced portfolio. When selection is based on maximum diversification, the proposed allocations are 4.1% and 2.6% respectively.

Timing is everything

Sepp is not claiming that the question of sizing allocations is straightforward.

The findings are highly sensitive to the time when the analysis takes place. A portfolio construction based on Sharpe ratio contributions, for example, would have assigned 6.1% to bitcoin at the end of 2021, but only 1.5% if the negative returns of recent months were included.

A key statistical observation in the BlackRock analysis is that, historically, bitcoin has displayed a high level of skewness. That conclusion, however, comes from observing data from the cryptocurrency's inception in 2009 until December 2021 – and it's a shaky assumption.

"Based on the data range from 2014 to today, it's not true that realised [monthly] returns of bitcoin have positive skewness," explains Sepp. "The skewness measured over more recent history is zero."

He believes a better starting date for analysis would be 2015, after six years of historical bitcoin prices and when trading was possible at a few crypto exchanges. Another option would be 2017, when bitcoin futures were introduced, thus making the cryptocurrency investible for a broader range of professional investors.

Canvassing opinions

Other researchers eschew a purely data-driven approach and see a way ahead that melds investors' subjective views with a quant methodology.

"The way I'd approach any portfolio optimisation problem is to maximise the expected utility of the client with respect to historical or scenario returns distributions," says Carol Alexander, professor of finance at the University of

Sussex. “This is preferable to making parametric assumptions about returns that definitely aren’t going to hold, certainly for bitcoin.”

Alexander suggests using hyperbolic absolute risk aversion (HARA) utility in the allocation model. “You can set your client’s risk tolerance and also how their risk tolerance changes with their wealth,” she says. Under HARA, risk aversion is linearly related to the investor’s wealth.

Alternatively, investors may wish to factor in their own, subjective expectations about returns. This might involve applying a model, such as Black-Litterman, that allows for statistical information to be complemented with an investor’s views. Under this approach, “bliss” could be inputted as a subjective view, with the confidence in that view represented by the probability of the regime being realised.

Diversification in decline?

Although diversification has been one of crypto’s key attractions, the sector’s diversification properties have waned in recent years. In the past three months, the correlation between bitcoin and the S&P 500 exceeded 0.5, calling into question the cryptocurrency’s status as a diversifying asset.

1. One-year correlation between bitcoin and S&P 500

Sol

Share

Nevertheless, Campbell Harvey, investments strategy adviser to Man Group, says pairwise correlations among the major cryptocurrencies, though high – most are 0.7-0.9 – show the sector still has the potential for limited diversification. That potential is mostly exploited by crypto-only funds, which are willing to be exposed to a basket of coins and other crypto-based projects rather than bitcoin alone.

Harvey, who is also professor of finance at Duke University in North Carolina, thinks the \$1 trillion market is too big to ignore. He declines to give a specific figure for the percentage of crypto assets that should be allocated to a diversified portfolio because he believes investors' views are too diverse and multifaceted for a generalised approach to be viable.

He nevertheless points out that the allocation problem will still have to be addressed.

A portfolio investing in the US equity market will unavoidably have exposure to crypto. “You might have zero direct investment in this space, but you’ve got negative exposure because this space potentially puts at risk a number of names in your portfolio,” says Harvey. If a decentralised finance venture succeeds and proves disruptive in a sector, the firms that have traditionally occupied that sector will suffer.

“Essentially, [the portfolio with no direct investment in crypto] behaves the same way as if you were short crypto,” he says. “You have negative beta.”

Editing by Daniel Blackburn

Copyright Infopro Digital Limited. All rights reserved.

You may share this content using our article tools. Printing this content is for the sole use of the Authorised User (named subscriber), as outlined in our terms and conditions - <https://www.infopro-insight.com/terms-conditions/insight-subscriptions/>

If you would like to purchase additional rights please email info@risk.net