2022 crypto halftime update
Three first half catalysts & three second half focus points

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Our work suggests the 2022 first-half crypto drawdown was impacted by an emerging combination of macro, market, and event-driven crypto factors.

What happened

The first half of 2022 ushered in a “crypto winter” not seen since 2018. Crypto investors had no safe-haven with bitcoin down -58%, ether down -72%, and broader indices declining in excess of -70%. As a result, the total crypto market cap fell below $1 trillion from its all-time high of $3 trillion in November 2021. In this note we highlight three catalysts behind the first half sell-off and three focus points for the second half.

Tightening financial conditions

Since the onset of COVID, macro factors have been a key driver of crypto returns. Excess liquidity injected into the financial system as a result of COVID catapulted crypto assets in 2020 & 2021. In 2022, stimulus has slowly evaporated as the Federal Reserve (Fed) tightens policy. Crypto in particular — along with other risk assets — have experienced collateral damage.

Crypto as an asset class, with Bitcoin as its leader, emerged from the ashes of the 2008 great financial crisis. Since then, the Fed has embarked on two aggressive rate hike cycles — one cycle peaked in 2018 and the other is ongoing. Concluding a cause-and-effect relationship between Fed policy and crypto prices may be premature given limited crypto history. Perhaps, however, it is not a coincidence that the crypto winters of 2018 and 2022 both occurred during Fed policy tightening regimes.

Equity bear market

So far, 2022 has presented tightening financial conditions, slowing growth, and rising inflation. Our ***Positive Yet Realistic*** 2022 outlook recognized many of these potential challenges against the backdrop of above trend economic growth and solid earnings trends. Equities fell into bear market territory and correlations between equities and crypto rose to all-time highs the deeper the equity sell-off became. **This supports our position that crypto has been ineffective as a risk diversifier and should best be thought of as a high-risk growth asset.**

Stablecoin and DeFi disruption

Stablecoin and decentralized finance (DeFi) sectors suffered unprecedented turbulence in May and June propelling an event-driven sell-off across the entire ecosystem.

Stablecoins, are the unregulated, unregistered, and uninsured crypto version of money market funds. They’re typically collateralized by short-term debt, such as treasury securities, or fiat currencies and account for 14% of the crypto ecosystem. Algorithmic stablecoins whose value is loosely tethered via mathematical formulas became front page news with the May collapse of the $80 billion Terra protocol. Terra’s failure was partly a consequence of the Anchor DeFi staking protocol which offered +19% staking yields leading to a lack of liquidity and proverbial run on Terra’s USD stablecoin contributing to its ultimate failure.

DeFi, at just 2% of the total crypto market cap, was at the epicenter of the June events that shook up the industry. Crypto lending platforms in DeFi operate much like traditional banks by accepting client crypto deposits, paying an interest rate on those deposits, then lending those deposits to crypto investors for a spread above the rates they pay depositors. Celsius, the failed DeFi lending protocol, was unable to meet customer withdrawal demand leading them to eventually halt withdrawals. Contagion led other crypto lenders to limit withdrawals and even forced the liquidation of key collateral assets such as bitcoin. This story is ongoing and is sure to be a future regulatory focus.

Continued on the next page

2022 Crypto halftime update – Three second half focus points (continued)

Early July returns have seen risk assets such as equities and crypto stage an impressive recovery off depressed June levels. However, investors should not read too much into this with such a wide range of possible outcomes for crypto. It may take years of maturation for the crypto asset class to break its inextricable link to equities as a high-risk growth asset.

Macro forces will likely begin to have a waning impact on the prices of crypto in the second half of 2022 as the economic impacts from shifting Fed policy remains fluid but are somewhat baked in at this point.

Crypto's story remains unique as recent events have continued to prove this asset class is still in its infancy and warrants heightened caution from investors. Just like the early days of any emerging technology, there are wrinkles to be ironed out including potential future platform failures (like Terra and Celsius), consolidation within the space, and regulation. We feel crypto-specific events and developments will be key drivers of crypto prices in the second half.

Three things we are watching include:

Regulation

On March 9, President Biden issued his executive order on *Ensuring Responsible Development of Digital Assets* outlining a whole of government approach to regulating digital assets. Multiple U.S. government agencies were tasked with submitting an action plan by year-end for their respective scope of responsibility. We expect to see slow progress on this prior to the November elections.

On June 7, Senators Lummis (R-Wyoming) and Gillibrand (D-NY) released their bi-partisan draft version of the *Responsible Financial Innovation Act*. It addressed stablecoins and Central Bank Digital Currencies (CBDC), customer protection, jurisdictional clarity between the SEC and Commodity Futures Trading Commission (CFTC), IRS guidance, and retirement investing among other items. We applaud this first serious attempt at sweeping digital asset legislation. We think it will serve as a productive template for the late-2022/early-2023 legislative agenda with its sections tackled piece by piece rather than being passed as a single bill.

The Ethereum merge

Ethereum and its native token, ether, is the second largest crypto protocol, but is the largest in the important smart contract sector. Smart contracts, thought of as "programmable money", are actually software programs serving as a conduit for real economy transactions that are heavily utilized by traditional companies. The "merge" aims to solve two of Ethereum's largest problems. First, the merge will shift Ethereum from a proof-of-work mining process to a proof-of-stake validation process reducing its energy usage by up to 99.5%. Second, it is designed to improve Ethereum's scalability problem by allowing it to process 100,000 transactions per-second (TPS), up from its current 15 TPS. The hope is it will vastly increase the scale of transactions it can process and at a significantly lower cost. Recent tests of these software improvements have proven successful and recent reports indicate a September launch is the new target date after several earlier delays. Its successful launch could be impactful for Ethereum, its competitors, and the businesses that rely on this technology.

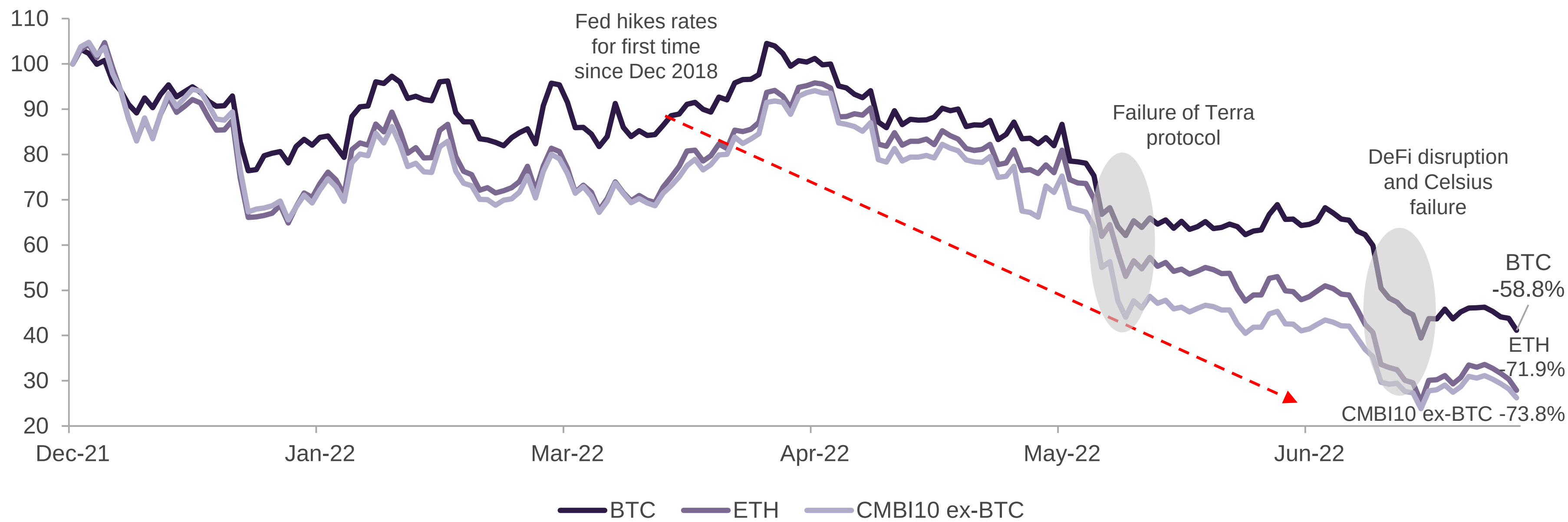
Valuation

Traditional equity valuation measures do not apply to crypto. Alternate valuation measures unique to crypto provide context to aid evaluation. Many of the measures we introduce in the following slides reflected stress points or support during the June selloff that have since shown signs of recovery. We will continue to monitor these for signs of continued improvement but there is no one-size-fits-all solution. Any investment in crypto should be informed and made with caution.

Year-to-date returns as of June 30, 2022

- Crypto returns through April were driven by macro factors such as Fed tightening, shrinking liquidity, and economic slowdown.
- Crypto returns aligned with equities reaching all-time high correlations at the June lows.
- May & June saw event-driven drawdowns fueled by failed stablecoin (TerraUSD) and DeFi (Celsius) protocols.
- The CMBI10 ex-Bitcoin Index is a cap-weighted index of ten of the largest crypto assets excluding bitcoin.

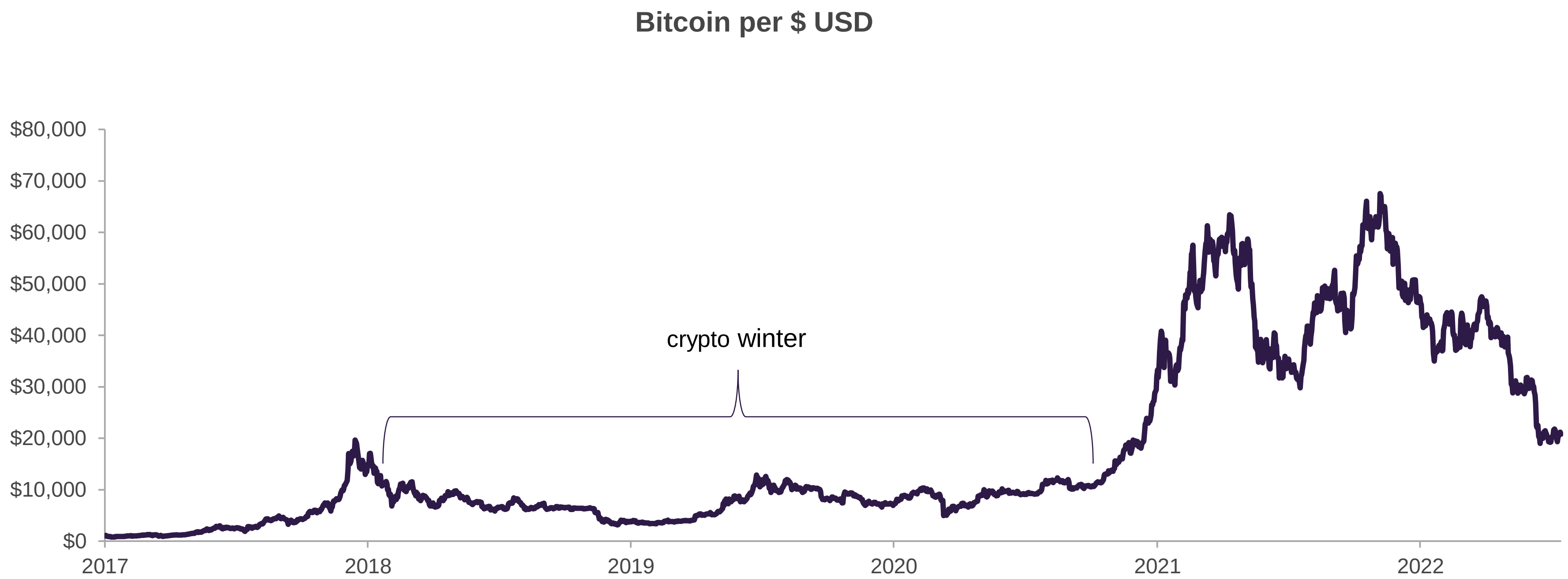
YTD crypto returns as of June 30, 2022 indexed to 12/31/2021
Bitcoin, ether and CMBI10 ex-bitcoin



Data sources: Truist IAG, CoinMetrics

Bitcoin erases post-pandemic gains

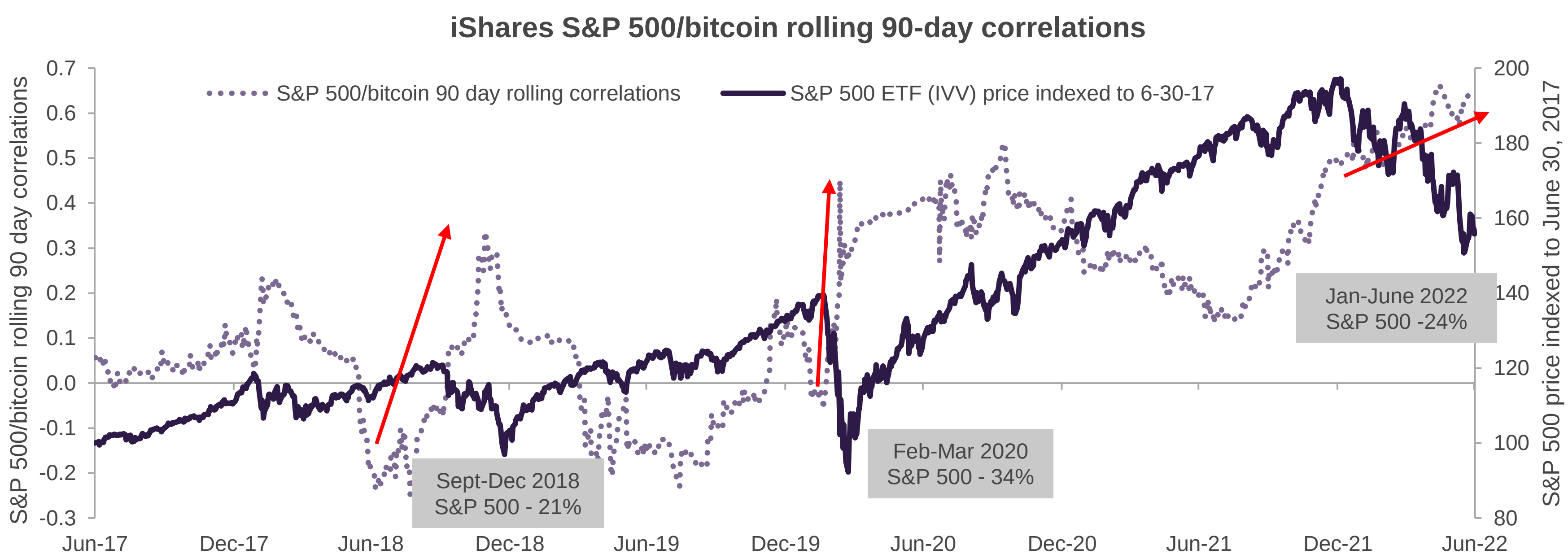
Bitcoin, which makes up over 42% of the market capitalization of all cryptocurrencies, continues to have the most profound impact on the asset class. Forced liquidations in order to make debt payments and meet margin calls has been a storyline among crypto businesses and miners this year. Bitcoin has found stability near the highs of 2018 as it has given up all post-pandemic gains.



Data sources: IAG, CoinMetrics. Data as of 7/17/2022

Bitcoin behaves as a risk asset during times of turbulence

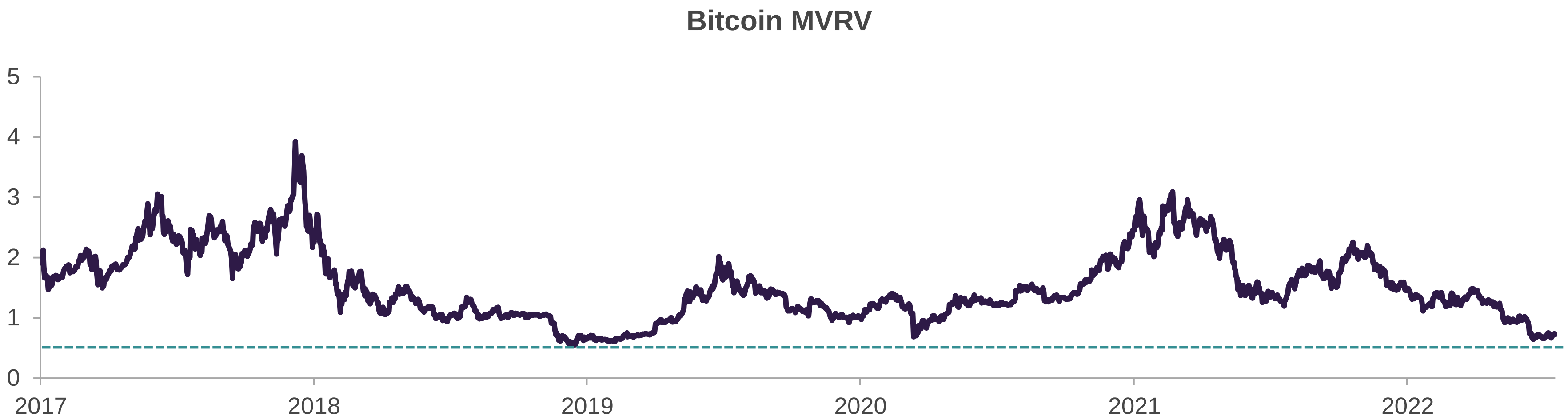
- Bitcoin/S&P 500 correlations have spiked during turbulent periods of U.S. stock performance.
- Bitcoin has not reduced portfolio risk during volatile times and has behaved as a high-risk growth asset.

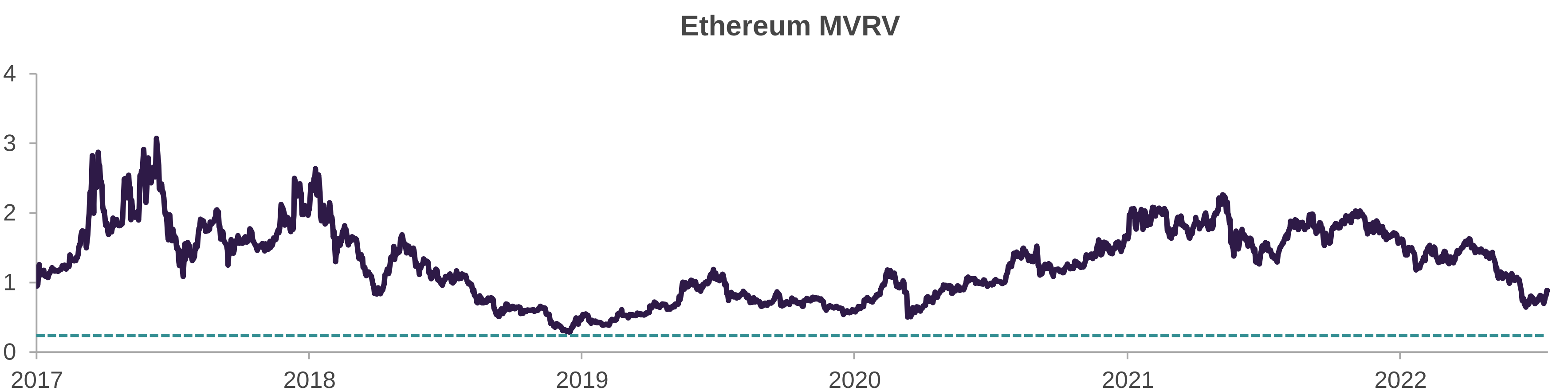


Data sources: Truist IAG, CoinMetrics, FactSet

Market value to realized value (MVRV)

Market value to realized value (MVRV) has historically been a reliable indicator of market tops and bottoms. MVRV is calculated by dividing bitcoin's current market capitalization by its realized capitalization. Realized capitalization is a snapshot whereby each unit of bitcoin is valued individually at the price it was last transacted at. Key support levels are continuing to hold.

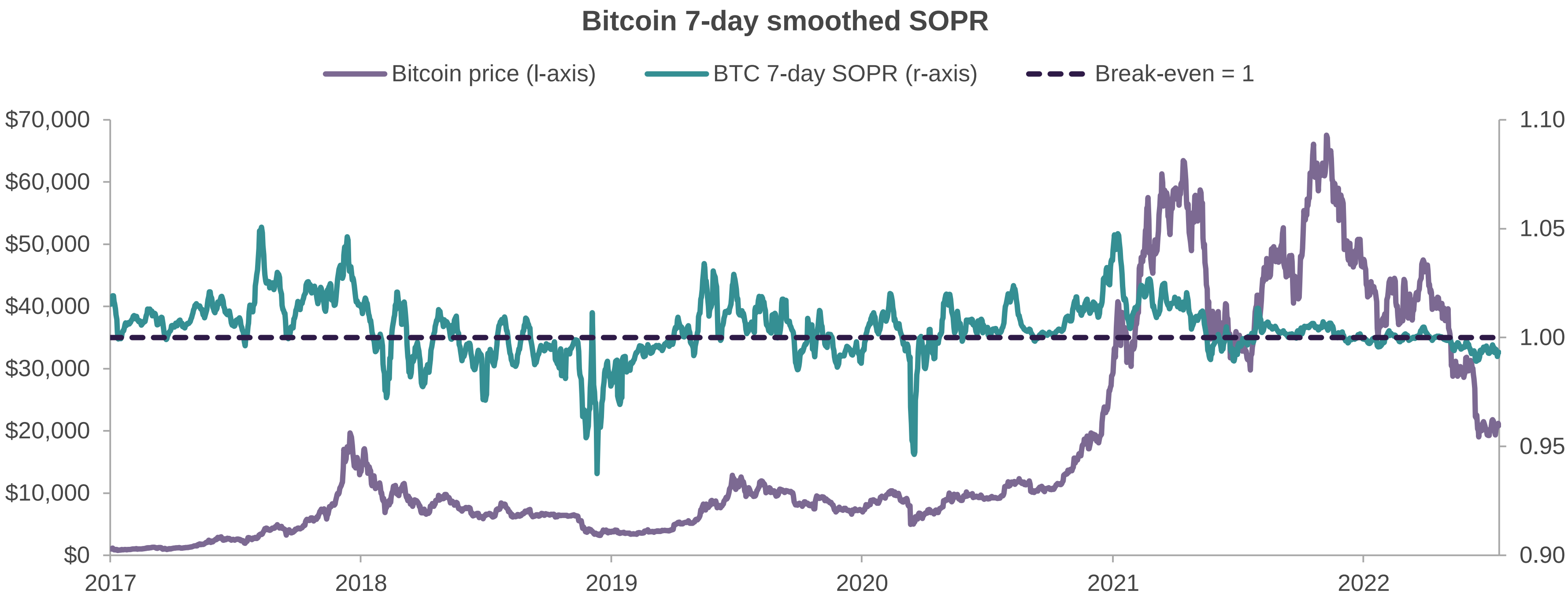




Data sources: IAG, CoinMetrics. Data as of 7/17/2022

Spent output to profit ratio (SOPR)

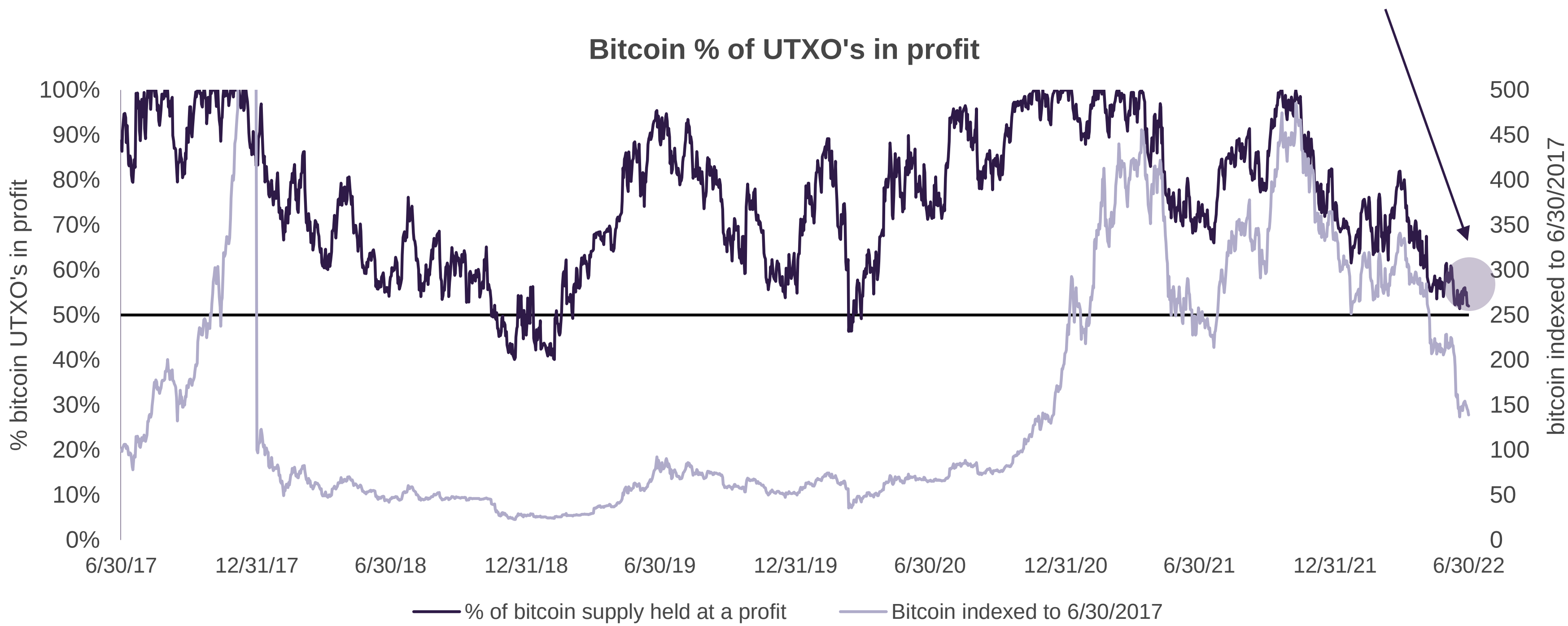
Spent output to profit ratio (SOPR) is a measure of aggregate profitability in bitcoin transactions. Prices paid are compared to prices sold. A value of one indicates break-even, while above one indicates profitability and below one represents net loss. What is noticeable are capitulation events — SOPR bottoms dramatically — prior to uptrends in the price of bitcoin. We've not yet witnessed capitulation in 2022, but on aggregate, investors are now letting go of their bitcoin at a loss.



Data sources: IAG, Coin Metrics. Data as of 7/17/2022

Bitcoin percent of UTXO's (unspent transaction outputs) in profit

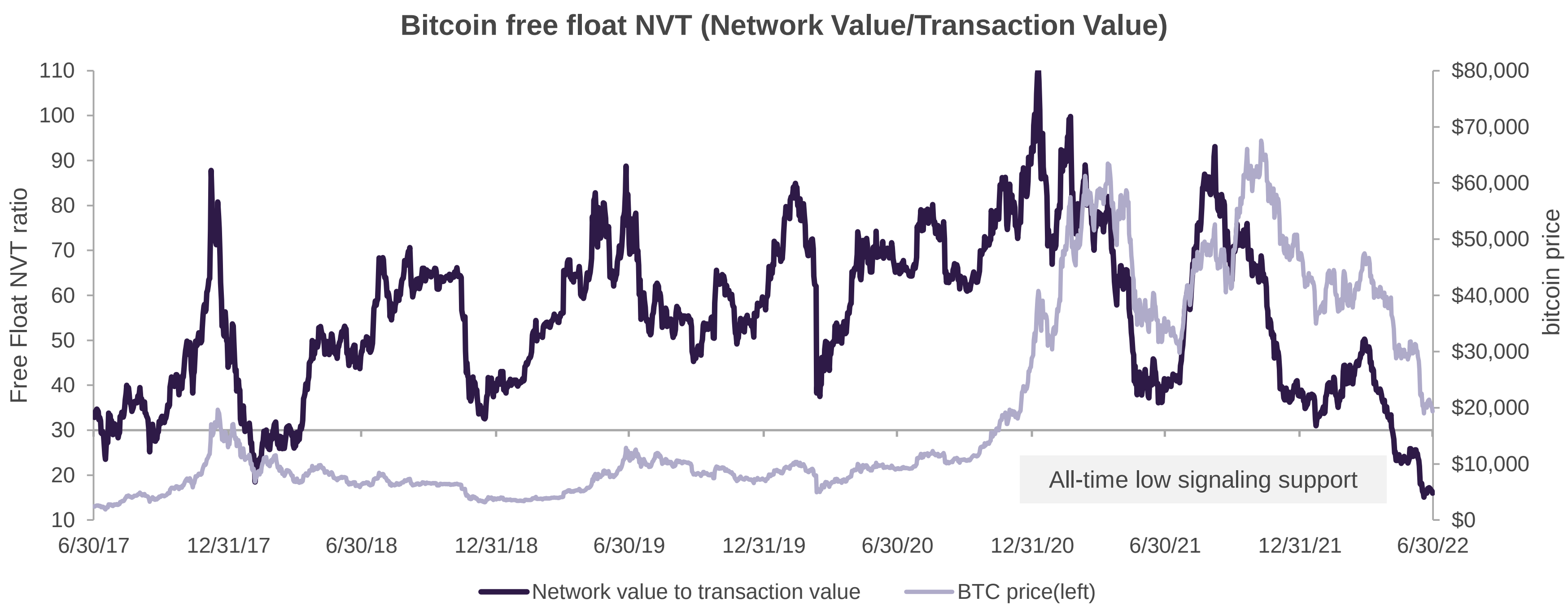
UTXO's are accounted for similarly to the paper currency you keep in your wallet. If you use a $20 bill to make a $10 purchase, then the recipient of your $10 and the $10 change you get in return are both an "unspent" $10 transaction. The difference, however, between cash and Bitcoin is that with each and every bitcoin transaction, a new cost basis is established. Bitcoin balances are accounted for at the coin level with each coin or fraction of a coin having a distinct cost basis. Historically price resistance is reached when the percentage of unspent bitcoins held at a profit reaches 95% and support is often found when bitcoins held at a profit falls to 50%. This typically coincides with large drawdowns like we saw in June below.



Data sources: Truist IAG, CoinMetrics

Bitcoin free float value to 90-day average adjusted transaction value

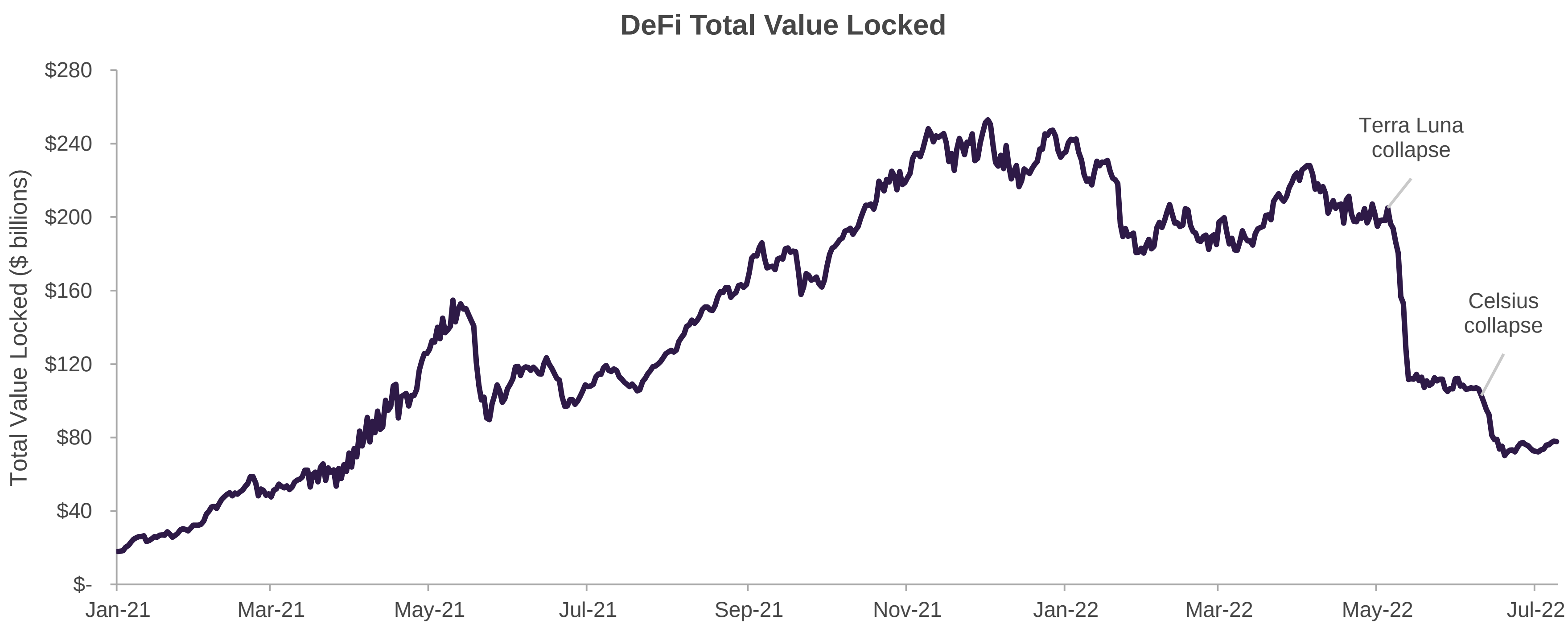
The NVT (Network Value/Transaction Value) is a useful metric in crypto valuation frameworks. The “free float” network value for bitcoin eliminates lost and inactive coins. The transaction value measured on the Bitcoin blockchain tells us the value of bitcoin transactions over the network. A high NVT ratio (above 70) often indicates overvaluation with little network activity similar to a high P/E. A low NVT ratio (~30) often indicates a pickup in network activity not yet reflected in BTC prices similar to a low P/E. This ratio hit a 5-year low in June.



Data sources: Truist IAG, CoinMetrics

Decentralized Finance (DeFi)

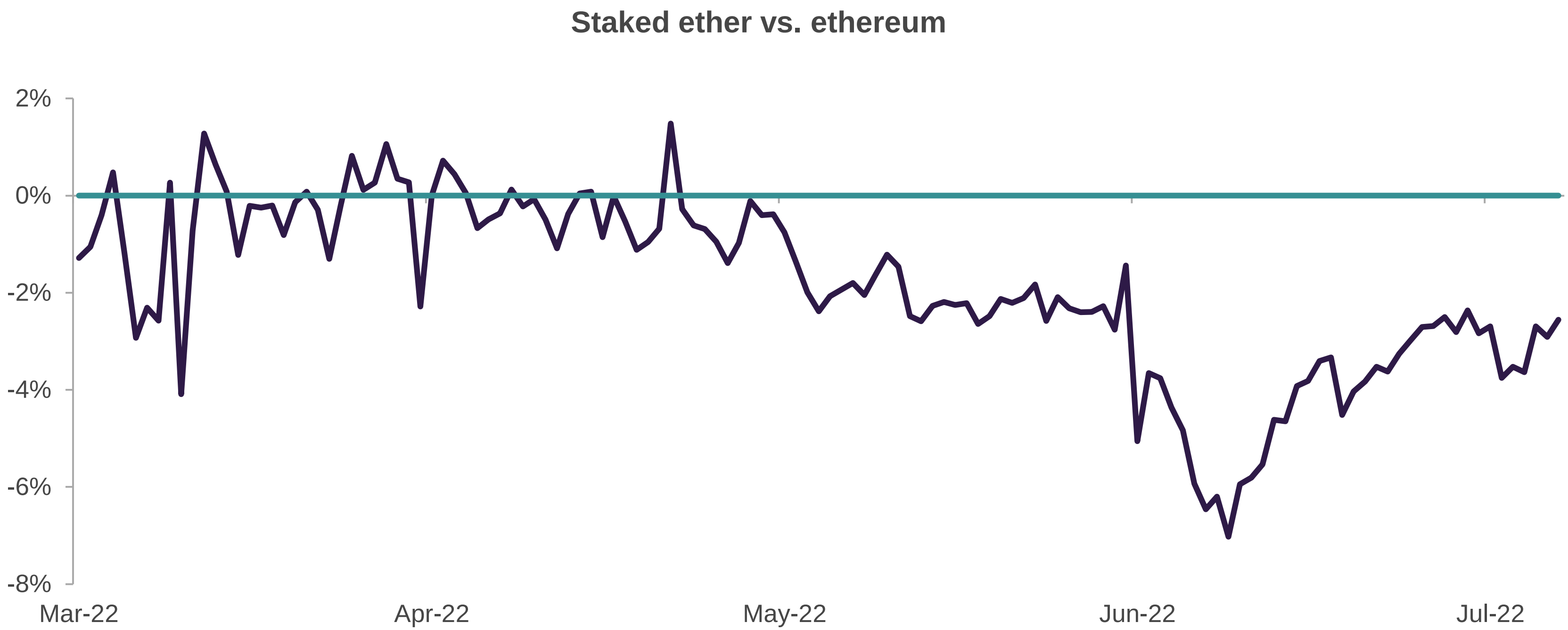
Decentralized finance (DeFi) provides peer-to-peer financial services to participants utilizing blockchain technology. Total Value Locked (TVL) measures the value of crypto tokens deposited by investors for purposes of earning a return. It is loosely analogous to deposits in a traditional banking context and has declined roughly 70% from its 2021 peak.



Data sources: Truist IAG, DeFi Llama

Staked ether, a pain point for Celsius

Staked ether is given in exchange for ethereum staked by investors in order to earn a yield. It was intended for staked ether to maintain a peg to ethereum so the two could be exchanged freely without a gain or loss in value. In mid-May, staked ether broke down based on poor liquidity conditions which caused trouble for Celsius, a crypto financier who had converted many client deposits of ethereum to staked ether. This dislocation guaranteed Celsius a loss each time they converted the staked ether back to ethereum in order to return capital to depositors and investors — prompting a subsequent halt on withdrawals. This relationship has improved but remains damaged.



Data sources: IAG, Messari. Data as of 7/17/2022

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Asset classes are represented by the following indexes. An investment cannot be made directly into an index.

U.S. Large Cap Equity is represented by the S&P 500 Index which is an unmanaged index comprised of 500 widely-held securities considered to be representative of the stock market in general.

Emerging Markets is represented by the MSCI Emerging Markets Index captures large and mid cap representation across 24 Emerging Markets (EM) countries. With 1,125 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

The MSCI World ex USA Index captures large and mid cap representation across 22 of 23 Developed Markets (DM) countries--excluding the United States. With 910 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

U.S. Core Taxable Bonds are represented by the Bloomberg U.S. Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, U.S. dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS and CMBS (agency and non-agency).

The Bloomberg Barclays US Treasury Inflation-Linked Bond Index measures the performance of the US Treasury Inflation Protected Securities (TIPS) market. Federal Reserve holdings of US TIPS are excluded from the index.

Commodities are represented by the Bloomberg Commodity Index which is a composition of futures contracts on physical commodities. It currently includes a diversified mix of commodities in five sectors including energy, agriculture, industrial metals, precious metals and livestock. The weightings of the commodities are calculated in accordance with rules that ensure that the relative proportion of each of the underlying individual commodities reflects its global economic significance and market liquidity.

The Coin Metrics Bletchley Index **(CMBI) Bitcoin** is a cryptoasset benchmark designed to measure the performance an investor would expect from purchasing and holding Bitcoin. The benchmark represents a market aggregate USD value for Bitcoin. It aggregates data from the major global BTC/USD markets that conform to the Coin Metrics Market Selection Framework.

The Coin Metrics Bletchley Index **(CMBI) Ethereum** is a cryptoasset benchmark designed to measure the performance an investor would expect from purchasing and holding Ether. The benchmark represents a market aggregate USD value for Ether. It aggregates data from the major global ETH/USD markets that conform to the Coin Metrics Market Selection Framework.

The Coin Metrics Bletchley Index **(CMBI) Bitcoin and Ethereum** is a cryptoasset benchmark designed to measure the performance of a portfolio of Bitcoin and Ethereum, weighted by their free float market capitalization. It aggregates data from the major global BTC/USD and ETTH/USD markets that conform to the Coin Metrics Market Selection Framework.

The **CMBI 10** is designed to measure the performance an investor would expect from investing in a diversified basket of crypto assets, weighted by their free float market capitalization. The 10 largest crypto assets, defined by an asset's expected 10 year future market capitalization, are selected as the index constituents.

The **CMBI 10 Even** offers an alternative to the CMBI 10 market cap weighted indexes. Even weighting strategies reflect the performance an investor would expect from investing an equal amount in a diversified basket of the largest crypto assets. Equal weighting is one of the oldest and best known methods of factor investing and aims to overcome weighting concentrating an index too heavily in a few large assets.

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The **CMBI 10 Excluding Bitcoin** is designed to measure the performance an investor would expect from investing in a diversified basket of the largest non-Bitcoin crypto assets, weighted by their free float market capitalization. As Bitcoin is often an investor's first exposure to crypto assets, the CMBI10EX was designed to provide a simple mechanism to diversify into other large cap crypto assets. The same constituents as the CMBI10, with the exception of Bitcoin, are selected as the index constituents.

The MVIS CryptoCompare Smart Contract Leaders Index is designed to track the performance of the largest and most liquid smart contract assets, and is an investable subset of MVIS CryptoCompare Smart Contract Index.

The MVIS CryptoCompare Decentralized Finance Leaders Index is designed to track the performance of the largest and most liquid decentralized finance assets, and is an investable subset of MVIS CryptoCompare Decentralized Finance Index.

The MVIS CryptoCompare Media and Entertainment Leaders Index is designed to track the performance of the largest and most liquid media & entertainment assets, and is an investable subset of MVIS CryptoCompare Media & Entertainment Index.

The MVIS CryptoCompare Infrastructure Application Leaders Index is designed to track the performance of the largest and most liquid infrastructure application assets, and is an investable subset of MVIS CryptoCompare Infrastructure Application Index.

The MVIS Global Digital Assets Equity Index tracks the performance of the largest and most liquid companies in the digital assets industry. This is a modified market cap-weighted index, and only includes companies that generate at least 50% of their revenue from digital asset services and products, such as exchanges, payment gateways, mining operations, software services, equipment and technology, digital asset infrastructure, or the facilitation of commerce with the use of digital assets. MVDAPP covers at least 90% of the investable universe.

CN2022-4872129.1 EXP 07-2023

Publication date: July 25, 2022