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Bitwise Asset Management

Crypto Basics: Bitcoin, Blockchain, and Crypto

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Crypto 101: Bitcoin, Blockchain, and Crypto



August 2022

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Agenda



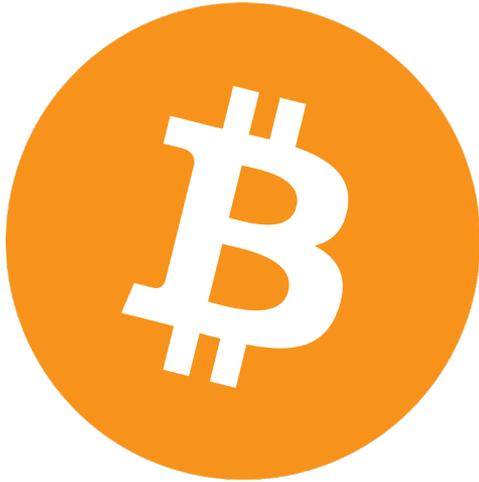
1. What is crypto and why does it matter?
2. Why is there more than one crypto asset?
3. What drives crypto returns?
4. Why invest? Crypto in a portfolio
5. Closing thoughts



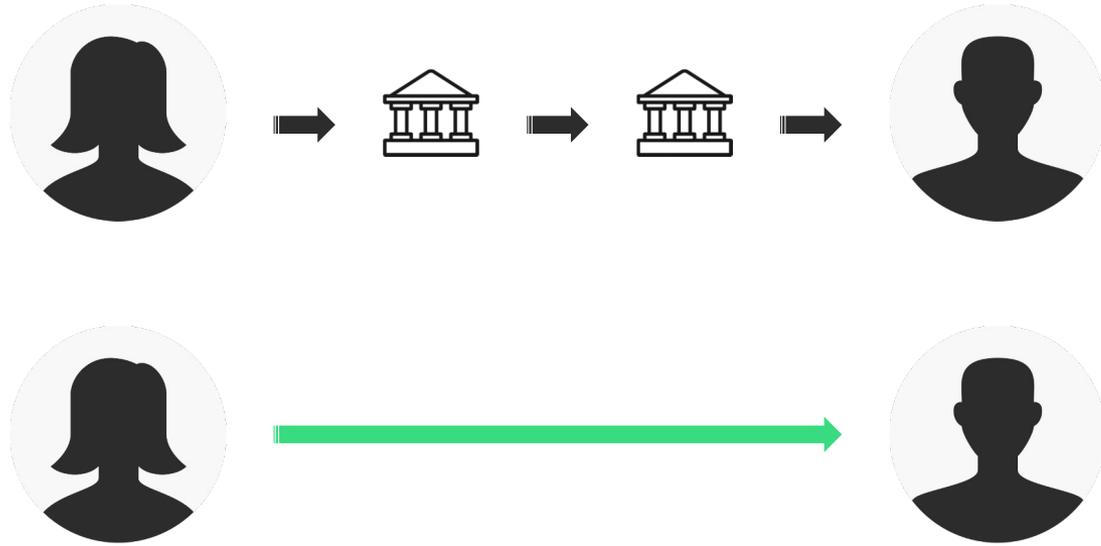
What is crypto and why does it matter?



Crypto is not about paying for coffee



Crypto is a technology that brings money into the internet era



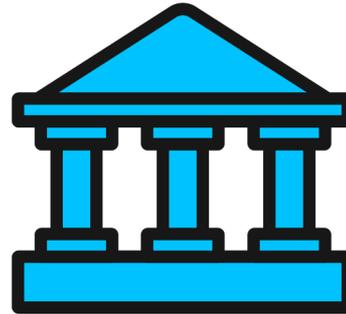
Consider: PayPal vs. traditional banks



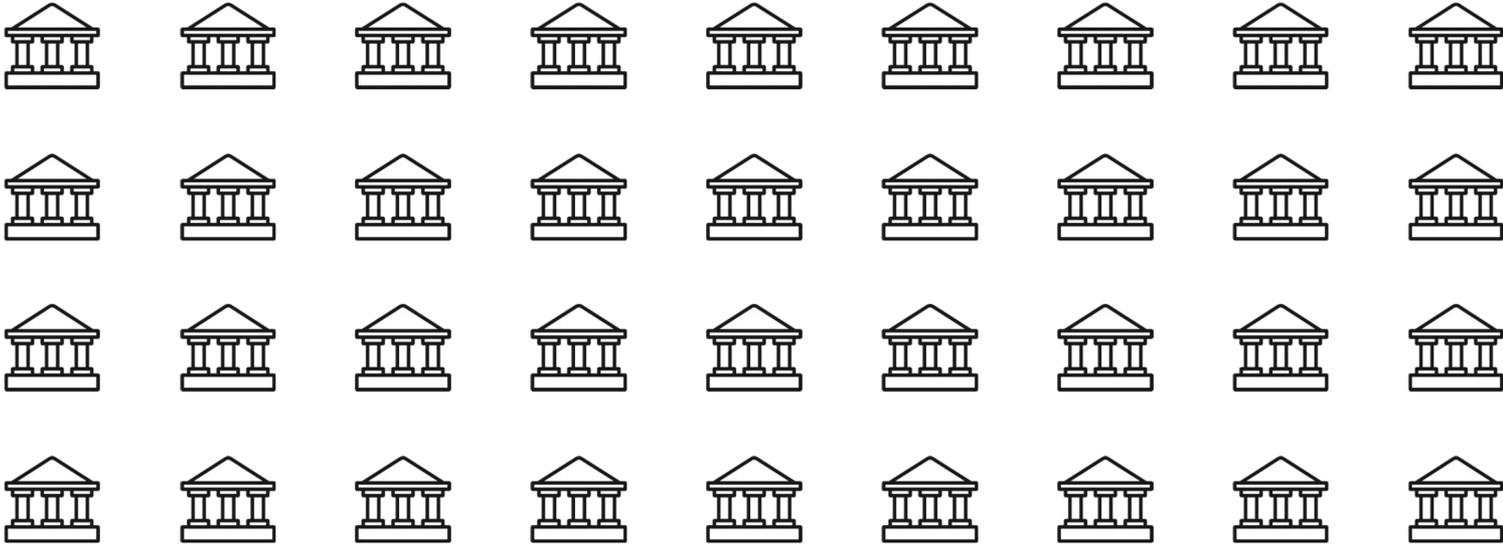
Banks are slow because they each have their own database. Every transaction requires verification and trust.



PayPal is fast because it is a single database. Inside PayPal, transferring money is like updating Excel.



Public blockchains are a new type of database



Breakthrough #1: Moving financial goods over the internet



Blockchain databases allow financial goods to settle essentially instantly.

By comparison, traditional financial systems are extremely slow:



Stocks settle in 2 days



Bank wires take 2-4 days



Bill pay takes 1-5 days

Blockchains work 24/7/365, settle within minutes, and have minimal fees in comparison.

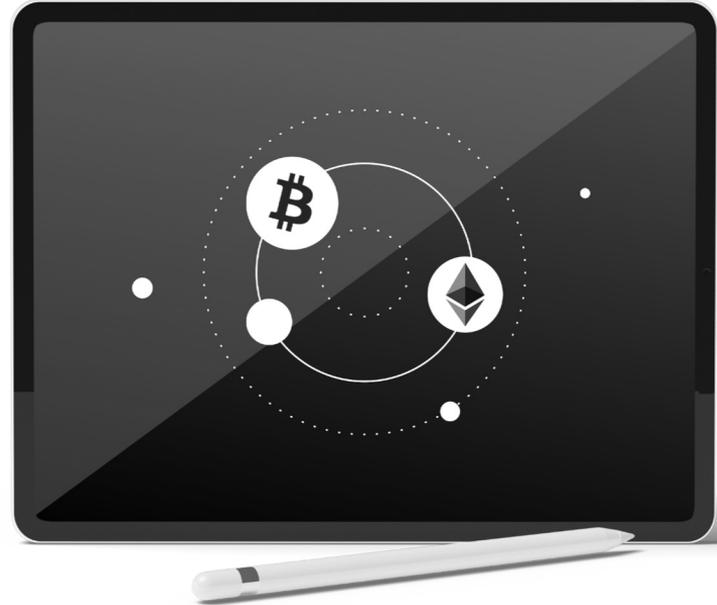
Breakthrough #2: The development of programmable money



Native to the internet, crypto assets can be programmed like software.

This software can automate high-cost financial functions at extremely low price points (“decentralized finance”).

This market already supports billions of dollars in loans, money market-style funds, asset fundraising, trading, and more.



Breakthrough #3: The creation of digital property rights

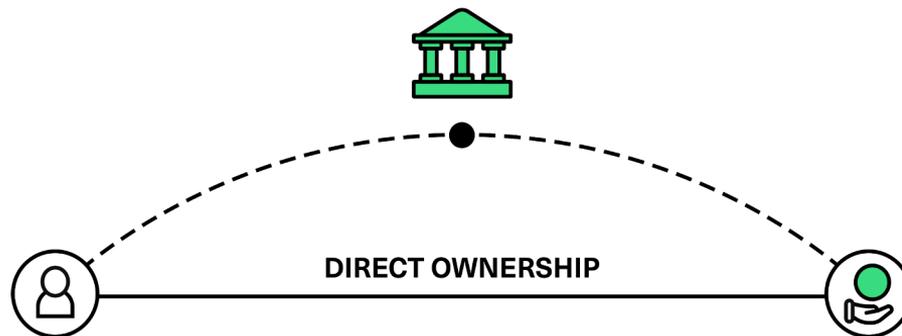


You can own a digital good without any trusted third party (like a bank) saying you own it.

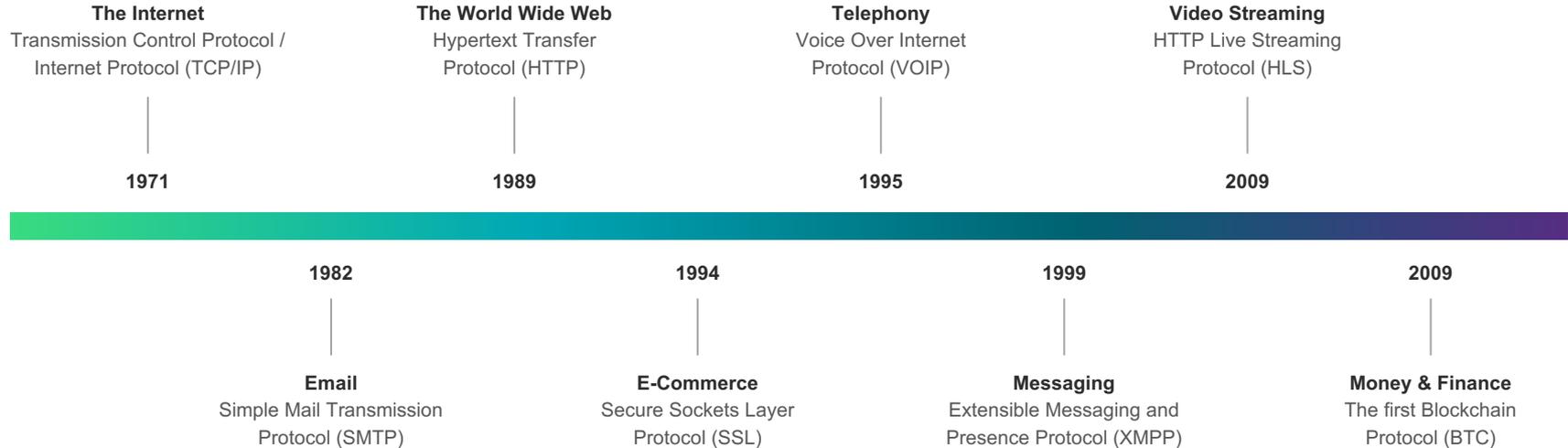
Blockchains allow individuals to prove that they own a digital good without any third-party intermediary.

Bitcoin is the first scarce digital good, and is often referred to as “digital gold.”

Non-Fungible Tokens (NFTs) are another example of this capability, and open up huge potential applications.



This level of technological breakthrough is rare



Source: Primary data from Wikipedia. Analysis conducted by Bitwise CIO Matt Hougan to select key breakthroughs and determine individual dates for certain technological developments that evolved in stages. This slide is not meant to represent every technological advance that contributed to the growth of the internet, but rather, to highlight key advances of specific protocol-layer capabilities.

Certain key risks to consider



1. Investor behavioral risk
2. Adoption risks
3. Valuation risks
4. Regulatory risks
5. Technological risk
6. Liquidity risk



Why is there more than one crypto asset?



Different crypto assets are not like different currencies; they are more like different software companies



The returns of different crypto assets vary over time

Periodic Table of Crypto Asset Returns

Monthly performance of each individual constituent of the Bitwise 10 Large Cap Crypto Index

SOL 21.27%	MATIC 67.48%	LTC 9.80%	MATIC 35.07%	LINK -10.38%	AVAX 17.26%	SOL 23.69%	ETH -14.53%	BTC -17.87%	LINK -18.14%	MATIC 113.33%	ETH -8.27%
BTC -7.99%	ETH 42.07%	ETH 9.38%	ALGO -9.69%	BTC -16.11%	BTC 8.93%	ADA 22.33%	BTC -15.62%	ADA -24.11%	LTC -24.16%	UNI 83.57%	LTC -11.74%
LTC -12.42%	SOL 40.87%	SOL 8.30%	ADA -17.53%	ADA -18.89%	ATOM 7.14%	DOT 18.28%	LTC -19.85%	ETH -31.17%	ADA -25.73%	ETH 68.47%	MATIC -12.01%
ETH -12.44%	BTC 39.58%	ALGO -0.38%	BTC -20.19%	LTC -23.84%	ETH 5.53%	ETH 15.87%	SOL -25.54%	LTC -31.95%	SOL -29.70%	AVAX 51.90%	ADA -15.06%
LINK -12.66%	LTC 26.15%	MATIC -2.75%	UNI -20.22%	ETH -26.30%	SOL 1.19%	AVAX 15.03%	DOT -26.48%	DOT -34.54%	MATIC -31.96%	SOL 36.90%	BTC -15.19%
MATIC -17.24%	LINK 25.61%	BCH -4.10%	SOL -20.83%	BCH -32.58%	LTC 0.03%	LINK 14.10%	LINK -30.68%	LINK -36.88%	DOT -33.75%	DOT 32.32%	LINK -16.04%
XTLM -20.13%	BCH 20.07%	BTC -5.44%	ETH -21.64%	MATIC -33.39%	MATIC -3.99%	LTC 13.22%	ADA -31.31%	MATIC -40.89%	AVAX -37.78%	LINK 31.12%	DOT -21.14%
BCH -22.02%	UNI 8.26%	LINK -12.18%	LINK -26.51%	AVAX -34.50%	DOT -8.49%	BTC 8.78%	MATIC -31.64%	ATOM -45.59%	BTC -40.21%	BTC 26.23%	AVAX -21.35%
UNI -22.38%	ATOM 7.13%	UNI -14.92%	BCH -26.60%	SOL -41.58%	ADA -10.31%	MATIC 3.41%	ATOM -35.20%	SOL -50.33%	ETH -47.25%	LTC 20.46%	SOL -26.64%
ADA -24.26%	ADA -7.30%	ADA -19.76%	LTC -31.41%	ALGO -42.63%	LINK -13.51%	ATOM -3.89%	AVAX -36.89%	AVAX -56.28%	BCH -49.38%	ADA 19.96%	UNI -29.55%

SEP. 2021 OCT. 2021 NOV. 2021 DEC. 2021 JAN. 2022 FEB. 2022 MAR. 2022 APR. 2022 MAY 2022 JUNE 2022 JULY 2022 AUG. 2022
For a full description of the index methodology please refer to <https://www.bitwiseinvestments.com/indexes/methodology>

Source: Bitwise Asset Management. Crypto asset tickers refer to, in alphabetical order: Cardano (ADA), Algorand (ALGO), Cosmos (ATOM), Avalanche (AVAX), Bitcoin Cash (BCH), Bitcoin (BTC), Polkadot (DOT), Ethereum (ETH), Chainlink (LINK), Litecoin (LTC), Polygon (MATIC), Solana (SOL), Uniswap (UNI), and Stellar Lumens (XTLM). The performance of the Bitwise 10 Large Cap Crypto Index does not represent the performance of any account or Fund managed or issued by Bitwise. This represents Index or Index constituent performance only. The Fund will have losses, liabilities and expenses that will offset its income and gains and therefore the Fund's performance may be below the Index's performance. In addition, the performance of the Fund and the Index may vary somewhat due to other factors such as imperfect correlation between the Fund's investments and Index composition, regulatory restrictions, high portfolio turnover rate, rounding of prices, and timing differences associated with additions to and deletions from the Index and the Fund. Please see important disclosure information at the end of this document. **Past performance does not guarantee future results. Any trading symbols, cryptocurrencies, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.**

Avg. monthly dispersion:

42.79%

Max. monthly dispersion:

93.37%

Min. monthly dispersion:

21.28%

It's difficult to know which asset(s) will win long term





What drives crypto returns?



Our mental model of crypto returns: Three main drivers



1. **Macro Factor:** Crypto is a risk-on asset, and benefits from risk-on environments.

2. **Crypto Factor:** Certain developments—like regulatory progress—impact all crypto assets.

3. **Asset-Specific Factors:** Individual crypto assets are impacted by product-market fit, technological progress, etc.

Bitcoin Returns March 2020



Source: Bitwise Asset Management and Yahoo Finance. Data from March 1, 2020, through September 6, 2022. Please see important disclosure information at the end of this document. Performance information is provided for informational purposes only. Past performance is no guarantee of future returns. These returns reflect the returns of crypto assets, and not of any fund, and do not include expenses or other costs.

Understanding recent market trends



March 2020 – November 2021

- **Macro: Positive** – Aggressive QE & fiscal stimulus
- **Crypto: Positive** – Institutions enter crypto in a significant way
- **Asset-Specific: Positive** – Bitcoin ETF approvals (globally and U.S.), inflationary concerns rising, record VC investment in crypto
- **Result:** Bitcoin surges from ~\$5,000 to ~\$68,000

Bitcoin Returns March 2020



Source: Bitwise Asset Management and Yahoo Finance. Data from March 1, 2020, through September 6, 2022. Please see important disclosure information at the end of this document. Performance information is provided for informational purposes only. Past performance is no guarantee of future returns. These returns reflect the returns of crypto assets, and not of any fund, and do not include expenses or other costs.

Understanding recent market trends



November 2021 – June 2022

- **Macro: Negative** – Fed moves to Quantitative Tightening (QT); fiscal stimulus slows
- **Crypto: Negative** – LUNA “stablecoin” collapse; Celsius, 3AC, Voyager bankruptcies; deleveraging
- **Asset-Specific: Neutral** – No major developments
- **Result:** Bitcoin falls from ~\$68,000 to ~\$18,000

Bitcoin Returns March 2020



Source: Bitwise Asset Management and Yahoo Finance. Data from March 1, 2020, through September 6, 2022. Please see important disclosure information at the end of this document. Performance information is provided for informational purposes only. Past performance is no guarantee of future returns. These returns reflect the returns of crypto assets, and not of any fund, and do not include expenses or other costs.

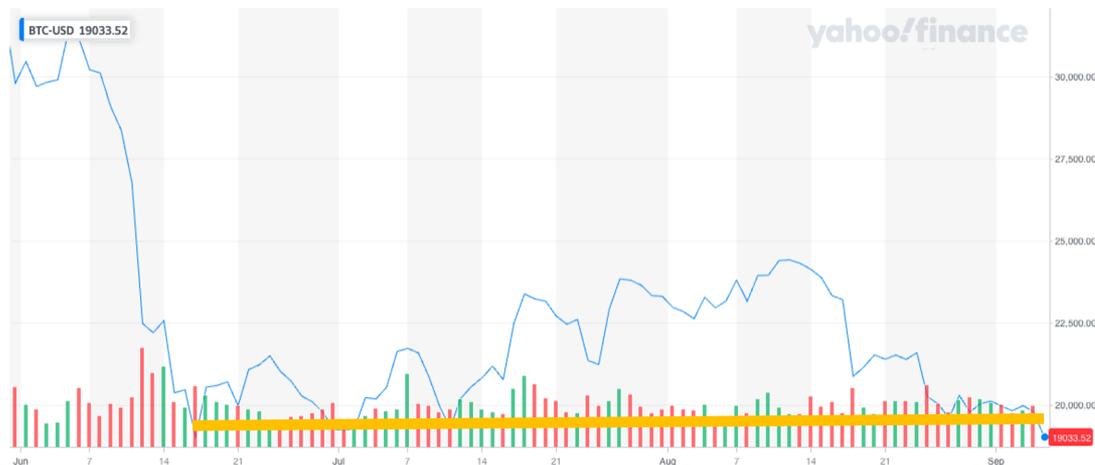
Understanding recent market trends



June 17 – September 6, 2022

- **Macro: Negative** – Fed strengthens push to fight inflation (Jackson Hole speech)
- **Crypto: Neutral** – FTX backstops crypto ecosystem with \$750m in credit lines; credit crisis ends; mixed regulatory news
- **Asset-Specific: Positive** – Excitement builds around Ethereum “Merge”
- **Result:** Bitcoin hovers around ~\$19,000

Bitcoin Returns Since June Market Bottom



Source: Bitwise Asset Management and Yahoo Finance. Data from June 1 through September 6, 2022. Please see important disclosure information at the end of this document. Performance information is provided for informational purposes only. Past performance is no guarantee of future returns. These returns reflect the returns of crypto assets, and not of any fund, and do not include expenses or other costs.

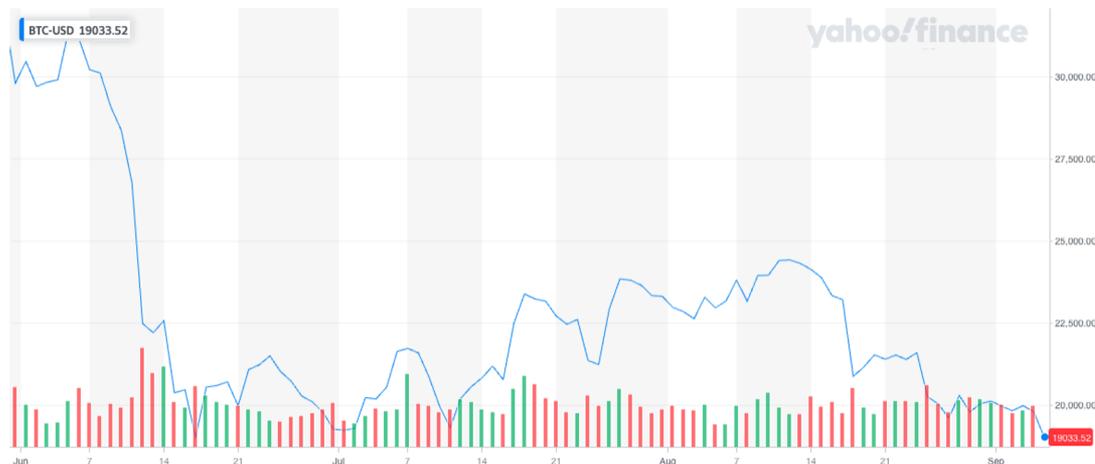
Bitwise outlook: Rest of 2022



September – December 2022

- **Macro: Negative** – Fed may overtighten; Congress winds down
- **Crypto: Neutral** – Regulatory uncertainty, particularly in September; election could be positive
- **Asset-Specific: Positive** – Ethereum “Merge”; record developer activity; industry strongly capitalized

Bitcoin Returns Since June Market Bottom



Source: Bitwise Asset Management and Yahoo Finance. Data from June 1 through September 6, 2022. Please see important disclosure information at the end of this document. Performance information is provided for informational purposes only. Past performance is no guarantee of future returns. These returns reflect the returns of crypto assets, and not of any fund, and do not include expenses or other costs.

The crypto market cycle: Four-year boom and bust



YEAR	BTC	YEAR	BTC	YEAR	BTC
2011	1474%	2015	34%	2019	94%
2012	186%	2016	125%	2020	308%
2013	5537%	2017	1349%	2021	57%
2014	-58%	2018	-74%	2022 (H1)	-59%

Sources: Bitwise Asset Management. Data from January 1, 2011, through June 30, 2022. Performance information is provided for informational purposes only. Returns reflect the return of bitcoin itself, and not of any fund or account, and do not include any fees. Backward-looking performance cannot predict how any investment strategy will perform in the future. Any trading symbols, cryptocurrencies, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.



Why invest? Crypto in a portfolio



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A small crypto allocation can go a long way in a portfolio



Portfolio Performance Metrics

Period between January 1, 2014 and June 30, 2022 (assuming quarterly rebalancing)

PORTFOLIO	CUMULATIVE RETURN	ANNUALIZED RETURN	ANNUALIZED VOLATILITY	SHARPE RATIO	MAXIMUM DRAWDOWN
Traditional Portfolio	50.96%	4.97%	10.34%	0.187	21.07%
Traditional Portfolio + 1.0% crypto	63.11%	5.94%	10.39%	0.276	21.32%
Traditional Portfolio + 2.5% crypto	82.61%	7.36%	10.63%	0.399	21.80%
Traditional Portfolio + 5.0% crypto	118.67%	9.66%	11.39%	0.569	22.76%

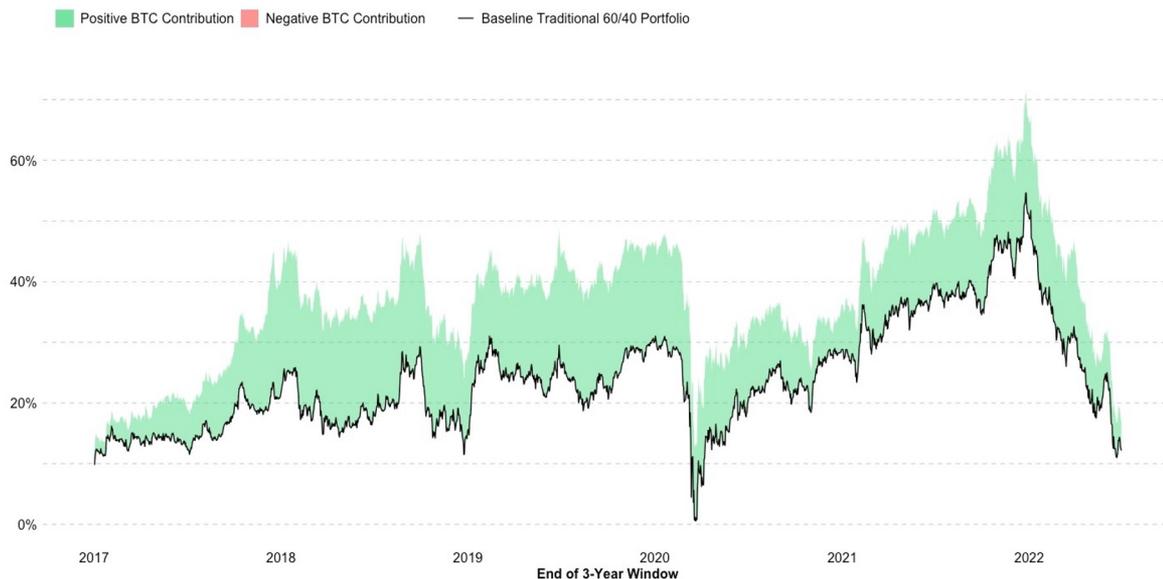
Source: Bitwise Asset Management with data from IEX Cloud. Note: Traditional Portfolio consists of 60% equities (represented by the Vanguard Total Stock ETF, VT) and 40% bonds (represented by the Vanguard Total Bond ETF, BND). Not considering taxes nor transaction costs. Bitcoin (BTC) is used as a proxy for crypto assets in general because its longer price history allows for more comprehensive historical analysis. For more details, please refer to our white paper "The Case For Crypto in an Institutional Portfolio" published in August 2021 and available at www.bitwiseinvestments.com/professional-resources.

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 charged by funds.

Bitcoin has positively contributed to a diversified portfolio's 3-year returns even during previous market drawdowns

Contribution of a 2.5% Quarterly-Rebalanced Crypto Allocation to a 60/40 Portfolio

Three-year rolling cumulative return for the periods between January 1, 2014 and June 30, 2022



Win rate: 100.00%

Avg. Contribution: 13.40%

Max. Contribution: 22.31%

Min. Contribution: 1.84%

Source: Bitwise Asset Management with data from IEX Cloud. Note: Traditional Portfolio consists of 60% equities (represented by the Vanguard Total Stock ETF, VT) and 40% bonds (represented by the Vanguard Total Bond ETF, BND). Not considering taxes nor transaction costs. Bitcoin (BTC) is used as a proxy for crypto assets in general because its longer price history allows for more comprehensive historical analysis. For more details, please refer to our white paper "The Case For Crypto in an Institutional Portfolio" published in August 2021 and available at www.bitwiseinvestments.com/professional-resources.

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Closing thoughts



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