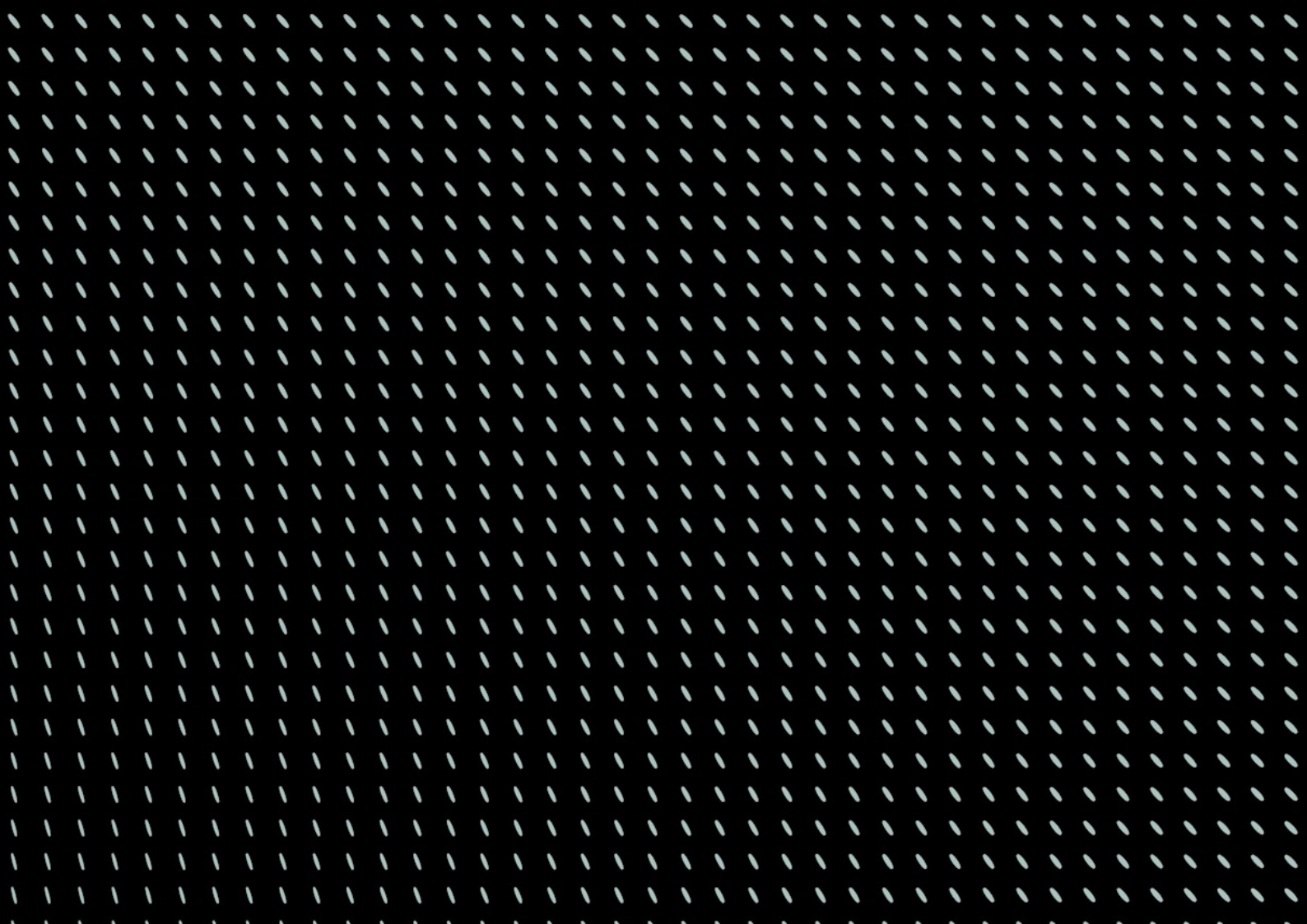


2021 Year in Review

coinbase INSTITUTIONAL





David Duong

Head of
Institutional
Research

About the author

David Duong, CFA leads our institutional research efforts. He was previously the Head of Latin America FX Strategy at HSBC Securities (USA) Inc., managing coverage on markets including Brazil, Mexico, Colombia, Chile, Peru, and Argentina. For much of his career, he was an EM rates strategist with experience in quantitative modeling. David holds a BA in computer science and political science from Colgate University and a MSc from the London School of Economics. He is also a CFA charterholder.

A note from the author

In early November 2021 the total market capitalization of cryptocurrencies peaked at US\$3.1 trillion before falling back to \$2.3 trillion by the end of the year. That's still nearly triple its size at the end of 2020 (\$777 billion).

Bitcoin's (BTC) dominance fell from 70% to 40% over that period, as we witnessed the explosion of the crypto economy, including decentralized finance (DeFi)/decentralized applications (dapps), non-fungible tokens (NFTs), play-to-earn gaming, and metaverse-related opportunities.

All this reflects a broadening landscape no longer focused predominantly on BTC. That said, the "original cryptocurrency" still holds a special place in the asset class: eight years after the first crypto exchange traded fund (ETF) application went to the Securities and Exchange Commission (SEC), the U.S. finally got approval for a [futures-based bitcoin ETF](#) in October 2021.

Looking ahead, 2022 promises to be equally exciting. One closely watched event will be the [merge](#) of the Ethereum Mainnet with the Beacon Chain, which may happen in H1 2022. Ethereum (ETH) is the second-largest cryptocurrency by market cap. Significantly, it is moving from a proof of work (PoW) to a proof of stake (PoS) consensus model, which should introduce greater efficiency to the network. As more ETH-centric scaling solutions (such as layer 2s) are introduced, we think the need to use or switch to alternative blockchain networks could decrease, potentially reducing volatility for the whole asset class as the competition for layer 1s begins to moderate.

This report takes readers on a tour of the crypto horizon, summarizing the most important market developments we are tracking from our institutional practice. We cover key developments for BTC, ETH and other altcoin protocols, and highlight key events for 2022. We also look at exchange volumes, DeFi, stablecoins, the regulatory environment, and our investment activity via Coinbase Ventures.

The rapid expansion of the crypto market brings Coinbase new horizons: unified developer docs at Coinbase Cloud; custody services to Facebook's NOVI venture; the launch of the Coinbase NFT marketplace; and, on the regulatory front, the introduction of Coinbase's Digital Asset Policy Proposal (DAPP).

We hope you find the report useful. If you have questions about our work or want to understand how Coinbase's institutional practice can help your firm engage with the crypto markets, please contact us at institutional.coinbase.com.

Additional resources

This 2021 report is part of our "in review" series, highlighting market developments and updates on our institutional practice in long-form format. We encourage readers to visit and subscribe to our team's other publications to stay up to date:

[Weekly market commentary](#)

[Institutional Resource Center](#)

[Coinbase Institutional Twitter account](#)

[Weekly market update calls](#)

Contributors

Brett Tejpaul

Head of Institutional Sales, Trading, and Prime Services

Gregory Tusar

VP of Product, Institutional

Lauren Abendschein

Director, Institutional Sales, U.S. and Americas

Brian Foster

Senior Manager, Institutional Sales

Chase Campbell

Institutional Sales Associate

Sid Shekhar

Senior Blockchain Researcher

Katherine Wu

Ventures & Ecosystem

Alex Zozos

Senior Counsel, Institutional

Data science

Kilian Mie

Senior Staff Data Scientist, Institutional

Kaylie Cheng

Data Scientist, Institutional

George Liu

Senior Quantitative Researcher

Matthew Turk

Quantitative Researcher

Content strategy

James Callan

Content Strategy Manager, Institutional

Paul Menchaca

Senior Content Strategist, Institutional

Jean Miller

Institutional Content Lead

Peer review

Anthony DeMartino

Director, Institutional Trading

Gustavo Miguel

Head of Derivatives

Mike Cohen

Crypto Content Strategist

Nick de Bontin

Senior Asset Integrations Manager



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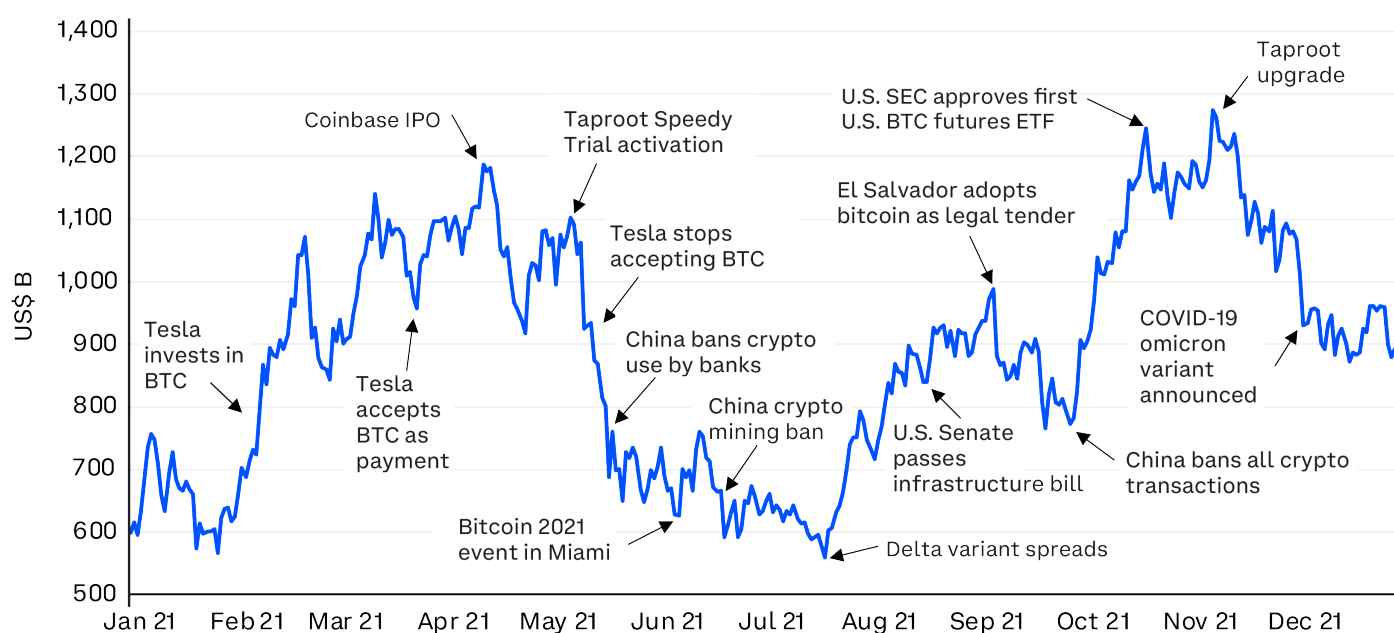
Analysis of asset performance

Bitcoin (BTC) reached two important milestones in 2021. In February it crossed the psychological threshold of \$1 trillion market capitalization. Then in October it passed \$400 billion in *realized* capitalization. Arguably, the latter is more meaningful as it takes into account the estimated 15% of BTC supply that may be unrecoverable, so is more likely to reflect the actual average cost of these coins.

However, the former has helped establish \$53,700/BTC as an important technical resistance level for BTC, away from the all-time high near \$69,000 reached in early November (following the BTC futures ETF launch).

Liquidity remains a challenge for higher BTC/USD prices, as volume tends to be light on the way up, acting as a barrier to breaching the ceiling. Fortunately, volumes also tend to be heavier on the way down, reinforcing technical support levels on market dips.

BTC market capitalization ended 2021 at \$900 billion



Source: Coin Metrics and Coinbase

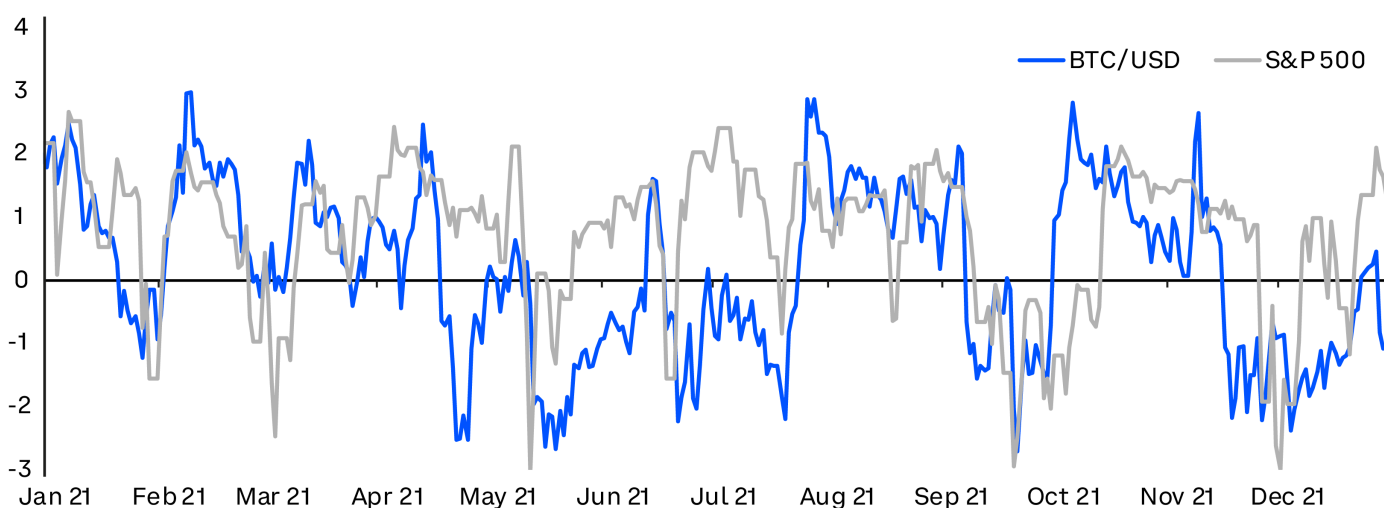
Overall, BTC's annualized return (vs. USD) moderated from about 300% in 2020 to 58% in 2021. In part this reflects three things:

- The withdrawal of pandemic-related fiscal and monetary stimulus in much of the world
- Waning support from the BTC [halving](#) in May 2020
- The maturing of cryptocurrencies as an asset class

Note that if you look at BTC's performance in terms of the rolling Z-score (that is, the number of standard deviations from its historical average), you see that it has mostly behaved like a risk asset over the past year, trading directionally in line with U.S. equities, apart from some notable exceptions. That could be important for cryptocurrencies in 2022, as cyclical factors may become more challenging for market assets in general.

While BTC could probably survive an economic slowdown, faster liquidity withdrawal by the U.S. Federal Reserve could be an important risk for cryptocurrencies as an asset class.

BTC/USD vs. S&P 500 (Z-score, 1m rolling window)



Source: Bloomberg and Coinbase

Market view

Futures ETF

One event that contributed to BTC pushing higher in early Q4 2021 was the SEC's approval of the first BTC futures ETF on the NYSE. The launch of the ProShares Bitcoin Strategy ETF saw trading volume of about \$1 billion on its first day, broadening the scale of exposure to the crypto asset. Together, the three U.S.-based futures ETFs, ProShares, Valkyrie and VanEck, have accumulated over \$2 billion in assets as at December 24.¹

Investors in these futures-based ETFs tend to pay a premium over the spot, as funds have to continually roll the first futures contract every month. In exchange, investors get the safety and familiarity of trading an equity product, rather than the underlying BTC itself.

The SEC has rejected three proposals for BTC spot-based ETFs as recently as [November 12](#), [December 1](#) and [December 22](#), 2021, citing concerns over "fraudulent and manipulative acts and practices." The approval bar for a spot-based ETF in 2022 remains rather high.

¹Bloomberg

**In 2021, we
witnessed the
explosion of the
crypto economy,
including
DeFi/dapps,
NFTs, play-to-
earn gaming,
and metaverse-
related
opportunities.**

Mt. Gox settlement

Something to keep in mind for 2022 is the [Mt. Gox settlement](#). After the Rehabilitation Trustee published its [confirmation order](#) on November 16, 2021, creditors are expected to be reimbursed for 141,686 BTC (c. \$7-8 billion), according to [Bloomberg](#). This could rattle some investors if the market is flooded with BTC at some point.

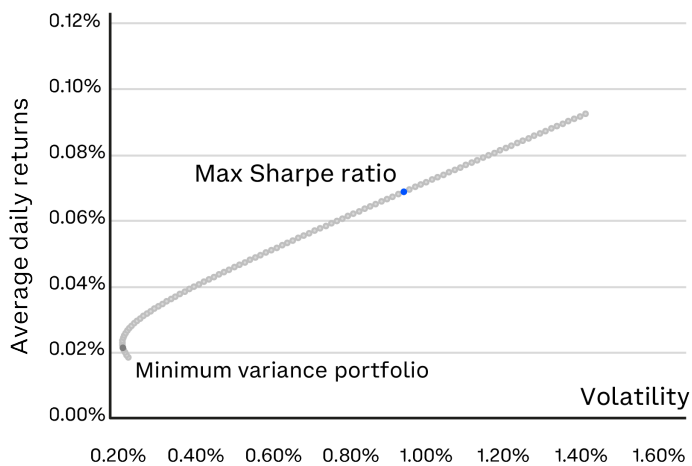
However, there are two mitigating factors. First, we think payments won't be made until mid-2022 or even [possibly 2023](#). Second, some [hedge funds](#) have been offering claimants early payouts in exchange for their settlements, so they will fall into institutional rather than retail hands, although we cannot speculate on whether these entities intend to "hodl" these assets ("hold on for dear life").

Portfolio allocation

Our efficient frontier analysis suggests that a portfolio of stocks and bonds can be enhanced by including cryptocurrencies. Important benefits of cryptocurrencies include diversification and rapid growth, particularly when valuations in other asset classes tend to look overextended relative to their fundamentals.

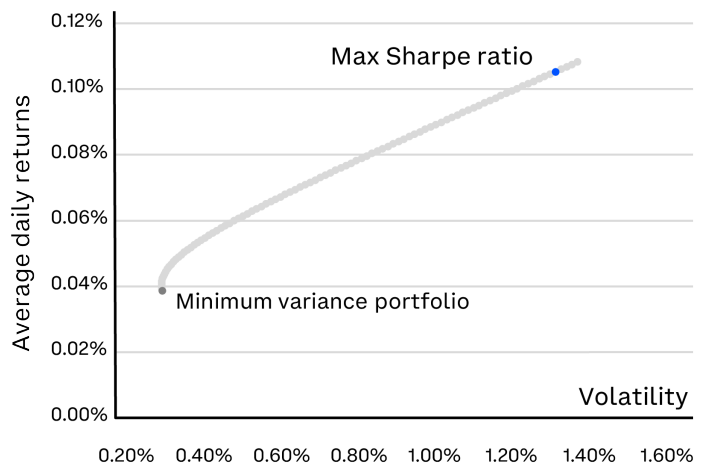
Below, using BTC as a benchmark for the broader asset class, we look at a two-asset portfolio of U.S. stocks and fixed income, proxied by the S&P 500 and the Bloomberg U.S. Aggregate Bond Index, using a three-year history of daily returns. The portfolio's maximum Sharpe ratio is reached when the asset mix is weighted 68% in favor of stocks. This is in line with Barron's ["Fall 2021 Big Money Poll"](#) (October 15, 2021), where respondents' average allocations were similar, with 68% invested in stocks (and 18% bonds, 8% cash, and 4% other).

Efficient frontier (U.S. stocks and bonds)



Based on daily returns calculated using S&P 500 and Bloomberg aggregate bond index. Period is from January 2019 to December 2021. Source: Bloomberg and Coinbase

Efficient frontier (Including bitcoin)



Based on daily returns calculated using S&P 500, Bloomberg U.S. aggregate bond index and bitcoin. Period is from January 2019 to December 2021. Source: Bloomberg and Coinbase

When we add BTC to this portfolio, the efficient frontier moves substantially higher with only a small adjustment to the right (i.e. a relatively small increase in volatility). For example, a minimum variance portfolio allocated 4% to stocks and 96% bonds would yield an average daily return of 0.02% with a standard deviation of 0.23%. However, a minimum variance portfolio allocated 5% BTC and 95% bonds would double that expected average daily return to 0.04% while increasing the standard deviation to only 0.32%.

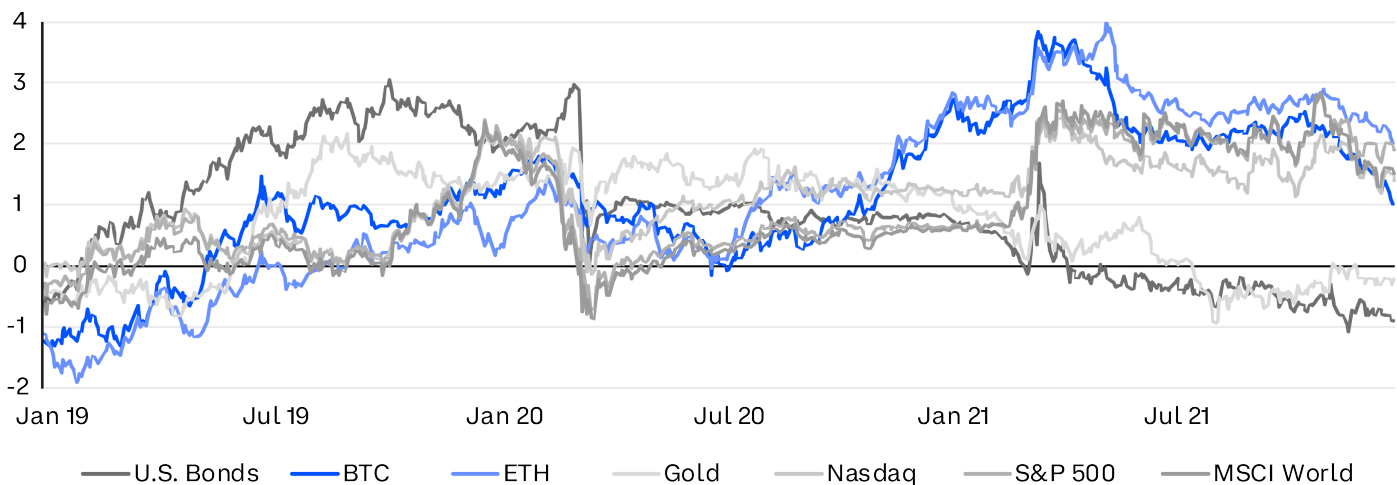
1.3

This suggests that adding BTC should improve a two-asset portfolio's Sharpe ratio. If we rebalanced our initial 68% stock vs. 32% bond portfolio to a three-asset portfolio including BTC (5% bitcoin/49% stocks/46% bonds), historical performance indicates that we can keep a relatively similar risk level while increasing average excess returns (annualized) from 16% to 20% per year.

Sharpe ratio

Through H1 2021, BTC's rolling 1y Sharpe ratio outperformed U.S. stocks, bonds and gold with an average risk-adjusted return of 2.8, compared with 1.7 for the S&P 500. However, poor performance in Q4 dragged this down to an average of 2.1 in H2 2021 — in line with U.S. equities and still healthy relative to other asset classes. Meanwhile, ETH remained strong, with a risk-adjusted return of 2.6 over that period.

Rolling 1y Sharpe ratio



Source: IEX cloud and Coinbase Exchange

On the upside, BTC continues to exhibit a low correlation of daily returns with other financial asset classes, albeit higher than in previous years. Over the preceding 12-month window, BTC registered correlation coefficients of 27.4% with the S&P 500, -3.5% with the U.S. core aggregate bond index, almost zero with gold, and 25.6% with the MSCI EM.

Correlation of daily returns of assets over past 12 months

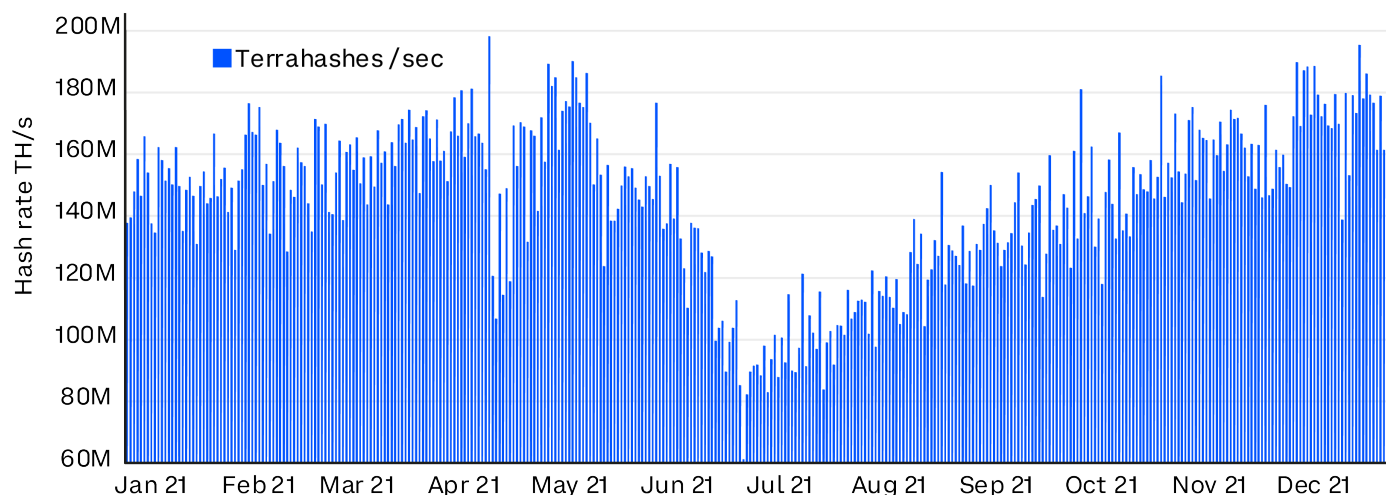
	BTC	ETH	S&P 500	U.S. Bonds	Gold	MSCI EM	Nasdaq
BTC	1.000						
ETH	0.797	1.000					
S&P 500	0.274	0.256	1.000				
U.S. Bonds	-0.035	0.019	0.069	1.000			
Gold	0.009	0.101	0.171	0.315	1.000		
MSCI EM	0.256	0.267	0.618	0.010	0.236	1.000	
Nasdaq	0.265	0.250	0.869	0.260	0.186	0.650	1.000

Source: IEX cloud/Coinbase Exchange

Taproot upgrade

In mid-November 2021, BTC's core protocol underwent the Taproot upgrade, the network's first major update since mid-2017 (when [SegWit](#) was introduced). Taproot was a [soft fork](#), implementing many improvements to overall transaction speeds, privacy and security while lowering fees, and increasing smart-contract functionality. For the most part, we think these developments were priced into BTC during early H2 2021, as the upgrade was approved by BTC miners in [mid-June 2021](#).

Without delving too deeply into the nuances of [Schnorr Signatures](#) and Merkelized Abstract Syntax Trees (MAST), one of Taproot's main advantages is that it allows the network to process more transactions much more quickly and cheaply on the core blockchain (compared with, say, the Lightning Network, a layer 2 parallel blockchain solution). It also allows greater privacy for "multi-signature" BTC transactions by masking them as single-signature transactions. Multi-sig addresses require signatures from more than one participant to authorize unlocking coins, and are used by organizations to store BTC more safely.

BTC hash rate, past 12 months

Source: Coinbase Analytics

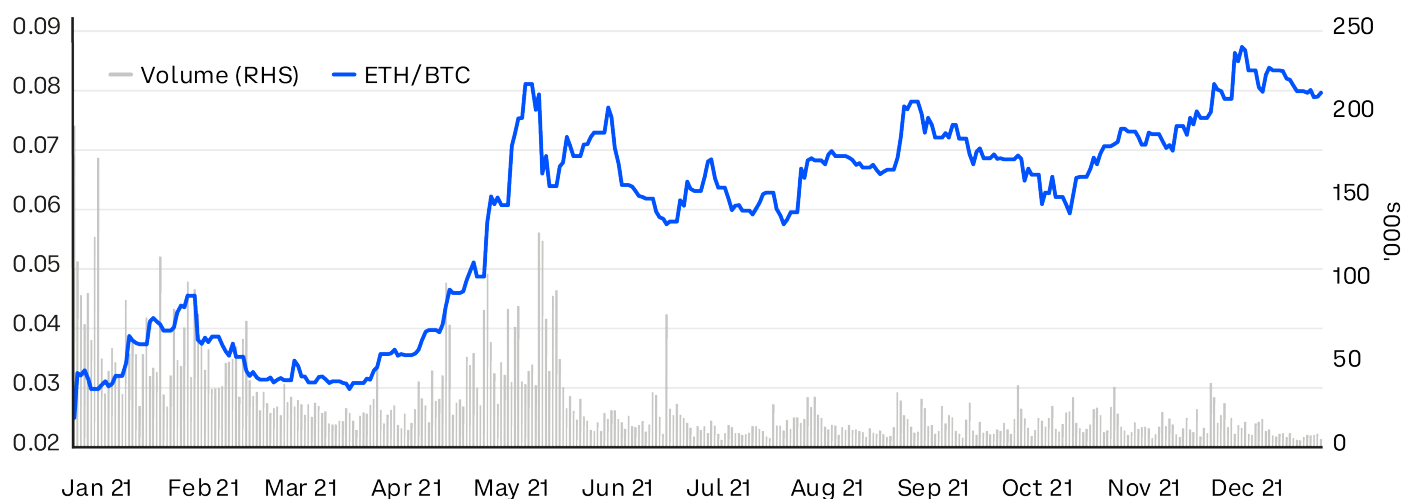
The Taproot upgrade has two implications. First, unlike the contentious SegWit upgrade, which led to a splinter network (Bitcoin Cash), there was widespread consensus. Importantly, this opens the door to future upgrades and potentially dispels [criticism](#) that BTC is not adapting to faster-moving developments elsewhere in the crypto space.

Second, Taproot scales the BTC network in a way that means smart contracts could more feasibly run on the blockchain. While Bitcoin already has smart contract capabilities, the size, expense and scale required has been prohibitive, preventing programmers from building applications on the blockchain. This could change and is something to watch out for in 2022.

Analysis of asset performance

Ethereum (ETH) made important gains against BTC in 2021, with the ETH/BTC currency pair reaching all-time highs by early December before falling lower. We think this reflects positive sentiment about the broader cryptocurrency ecosystem, as ETH outperformed in both rallies and sell-offs.

ETH/BTC price movement in 2021



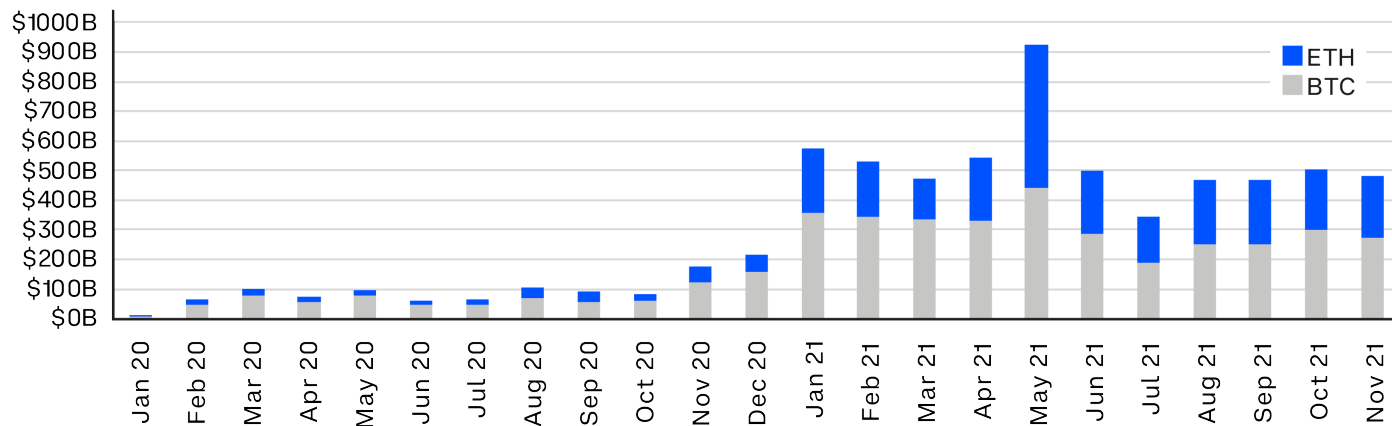
Source: Bloomberg, TradingView and Coinbase

Indeed, while BTC arguably remains a “store of value,” ETH performance in 2021 was boosted by the growth of its platform, driven by the continuing rise in decentralized finance (DeFi), decentralized applications (dapps), play-to-earn gaming, and the NFT market.

Ethereum can best be understood as a giant, decentralized computing platform designed to host and run applications. This means that, as innovation in the crypto space increases, users are increasingly attracted to the ETH blockchain. In turn, this accelerates adoption of the overall network, which can directly affect ETH’s value as demand rises, though this is by no means the only driver. (This is akin to Metcalfe’s Law, which ties a blockchain’s value directly to the number of nodes on that network.)

2.1

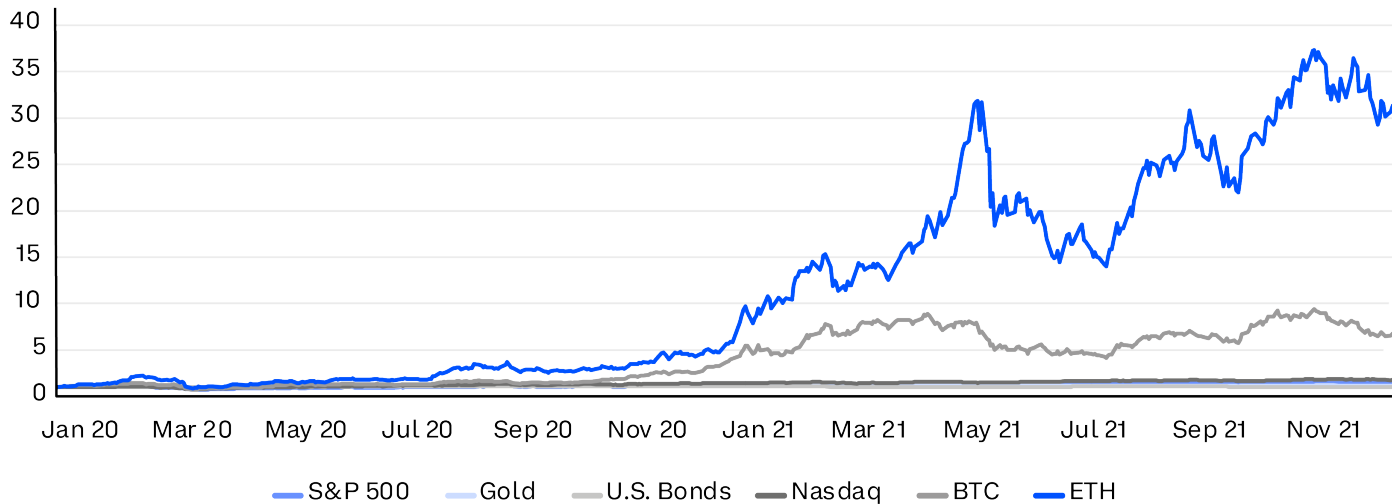
ETH vs. BTC total spot volume across centralized exchanges



Source: Coinbase Analytics. Exchanges include: Binance, Binance US, Bitfinex, BitFlyer, Bitso, Bitstamp, Bittrex, Coinbase, CoinField, FTX, Gate.io, Gemini, HitBTC, ItBit, Kraken, Liquid, LMAX Digital, Mercado Bitcoin, Nominex, Poloniex

That said, although transactions on Ethereum’s base-layer network grew significantly in 2020 and H1 2021 (reaching an all-time high of 1.7 million in early May), daily transactions started to decline in H2 2021 to 1.2 million by the end of December. This partly reflects the rise of [layer 2 scaling solutions](#) such as ZK-rollups, optimistic rollups and sidechains, as well as the competing layer 1 networks, which we discuss in “The rise of alt L1s” section.

ETH performance vs other assets since start 2020 (Index: Jan 2020 = 100)



Source: IEX cloud/Coinbase Exchange

**While BTC
arguably remains
a "store of value,"
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Market view

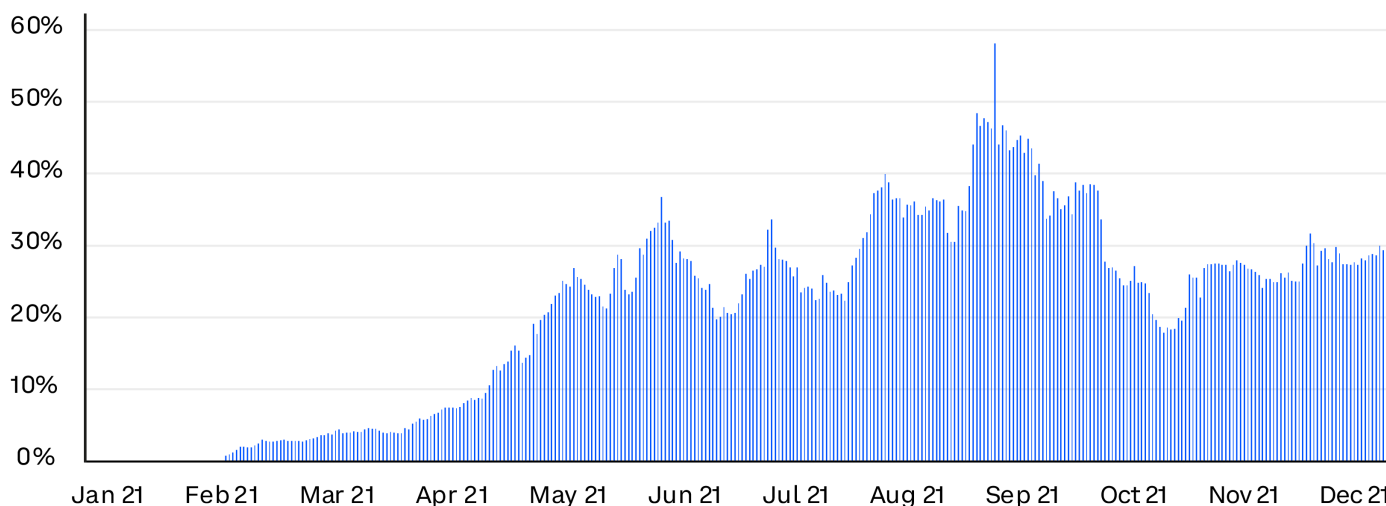
Futures ETF

Initially there were high expectations for an ETH futures ETF in 2022, with [some](#) believing it could happen as early as Q1 2022. But anticipation has abated after several applications were withdrawn. ProShares, VanEck and Kelly Strategic Management were among those who withdrew applications.

We think this signals potential roadblocks to implementation.

- ETH futures on the CME (a U.S. derivatives exchange) lack a long trading history, launching only in February 2021, while BTC futures have been around since December 2017.
- The size of the ETH futures market could be an issue, with less than \$1 billion of open interest trading on the CME, compared with \$3.6 billion on BTC futures.
- The average daily volume of ETH futures in Q4 2021 was about 54% of the BTC futures average daily volume. This suggests that liquidity for these futures is not robust enough to support the increased volume from ETF inflows.

ETH futures open interest on CME as % BTC futures OI



Source: Skew and Coinbase

Protocol review

Several key upgrades to the Ethereum network took place in 2021, including the Berlin hard fork in April and the London hard fork in August, both on Ethereum's proof of work (PoW) chain. While both were intended to better define gas fees for the blockchain, the latter also tightened overall monetary policy.

Monetary policy

This is why [EIP-1559](#) (Ethereum Improvement Protocol) was so significant. The August update meant that users of the Ethereum network no longer had to bid on transaction fees to miners, instead paying base fees, which are:

- Fixed per block
- Calculated based on the size of the current block relative to the preceding one
- Payable in ETH
- Permanently removed from the circulating ETH supply

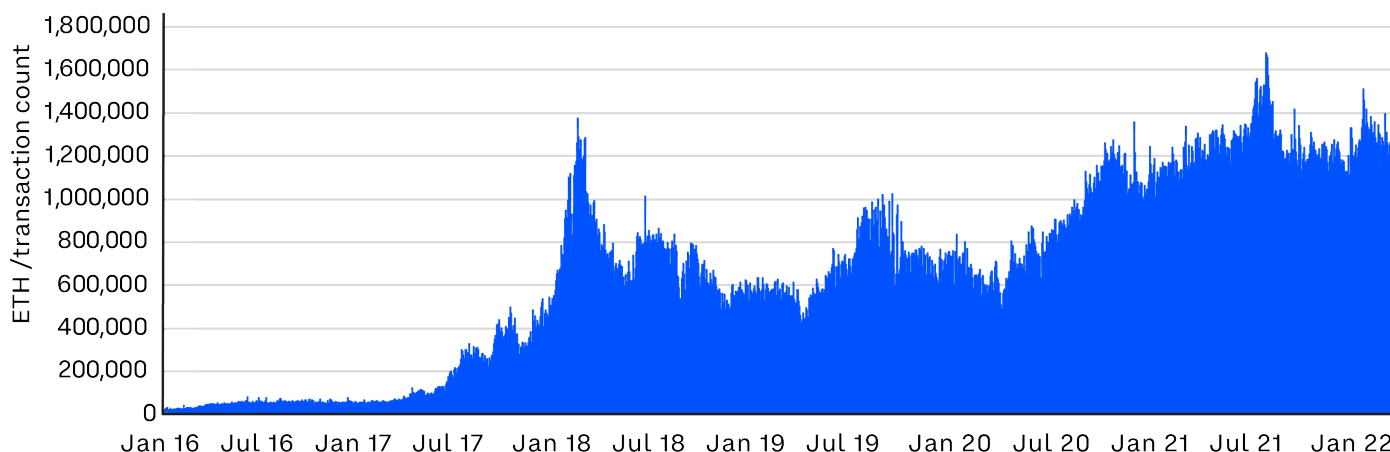
2.3

As there is no fixed supply for ETH (unlike the 21 million cap for BTC), this mechanism is important for balancing supply and demand (proxied here by relative block size) for ETH. Not only is it disinflationary in nature; it also introduces potential deflation if more ETH is burned than generated in mining rewards (which actually happened in late October 2021).

However, average gas fees did not decline after the implementation of EIP-1559, because of a commensurate rise in on-chain activity in late Q3/early Q4 2021. On-chain data indicates that net fees collected on the base network rose from 2,147 ETH at the start of H2 2021 to 21,131 ETH by September before falling to 10,425 ETH by the end of the year.

The uptick in Q3 was associated with the expansion of DeFi activity and the NFT market. In our view, this shows that the higher fees resulted from a scalability problem as demand exceeded supply.

Ethereum network daily transactions since inception



Source: Coinbase Analytics

Merge in 2022

The long-awaited [merge](#) of the Ethereum Mainnet with the Beacon Chain should occur in 2022, bringing us close to the full launch of ETH 2.0 (possibly in 2023). After the [Arrow Glacier](#) update to ETH in early December, the difficulty bomb (which increases difficulty in the algorithms underpinning ETH's proof-of-work consensus model) was pushed back to June 2022. As a result, [some](#) speculate that the merge could occur in H1 2022, when Ethereum would officially migrate to the proof of stake (PoS) consensus mechanism. Implementation could bring efficiency gains, but the timing remains uncertain and has faced several previous delays.

The merge would significantly improve Ethereum, enabling greater speed and efficiency (in terms of onchain computation), and creating a better framework for scaling. The transition to PoS also helps reduce ETH issuance, as it doesn't rely on competitive mining.

However the full benefits may only be available after [sharding](#) in the network, which may not happen until 2023 at the earliest, suggesting that users will continue to depend on layer 2 scaling solutions to accommodate growing demand. Only then are we likely to see the blockchain overcome its high transaction fees when the network is heavily congested, one main obstacle to greater adoption.

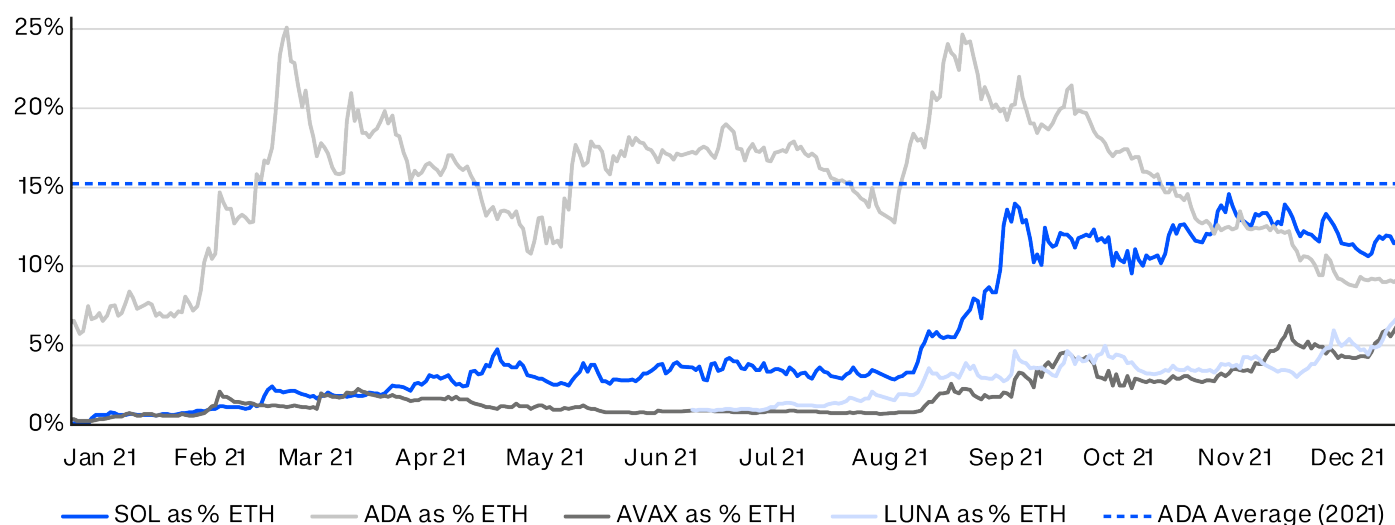
To validate transactions on the Beacon Chain, validators must stake 32 ETH each. As of December 31, [8,749,442](#) ETH was locked up in the ETH 2.0 Deposit Contract, worth around \$33.4 billion at the time. This represents 7.2% of the total circulating ETH supply.

Scalability is one of the biggest challenges for wider cryptocurrency adoption. Network congestion and high gas fees on Ethereum have propelled rapid development of other layer 1 (L1) blockchains in 2021 alongside layer 2 (L2) scaling solutions to create more economically viable alternatives. Layer 1 networks are standalone blockchains independent of other blockchains. Layer 2 solutions are “secondary” frameworks that can be integrated and used in conjunction with layer 1 chains (mainly Ethereum) to speed up throughput and [reduce fees](#).

The market cap of many L1s has risen in proportion to their potential to improve scalability without significant loss of security or decentralization (the so-called “blockchain trilemma”). Among the top 10 coins and tokens by market cap, some important “blue chip” L1s stand out, including Solana (SOL), Cardano (ADA), Avalanche (AVAX), and Terra (LUNA) although at the start of 2022, we saw more attention given to names like Fantom (FTM), Cosmos (ATOM) and NEAR. One big [question](#) for investors is whether one of these prevailing L1s can improve transaction capacity enough to reduce Ethereum’s competitiveness arising from the blockchain’s first mover advantage.

Individually the market cap of each L1 protocol is only a small fraction of Ethereum’s — Solana is the highest at 12% (see chart below). However, Terra has the highest total value locked (TVL) of the L1 alternatives: at \$21 billion it is over 13% of ETH’s TVL.

Market cap of “blue chip” L1s as a percentage of ETH



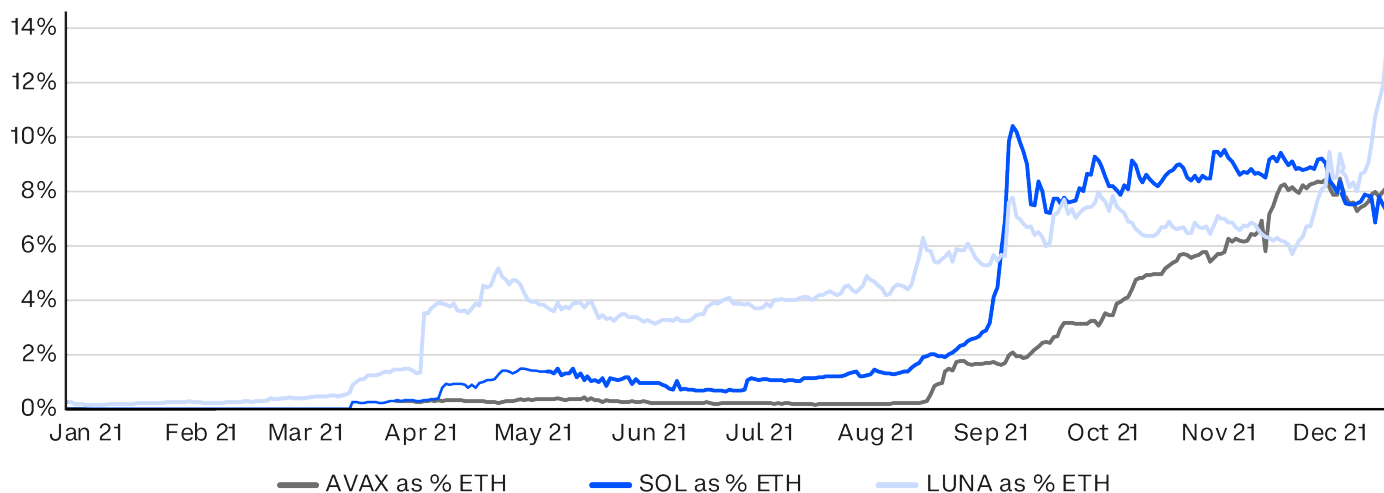
Source: TradingView and Coinbase

3.1

One way to look at this from a valuation perspective is to try to estimate the expected market capitalization of these L1s as their percentage of ETH market capitalization and compare those figures with the level of development on these networks.

Cardano (ADA) is a good example: it tested the 25% (of ETH market cap) barrier twice in 2021 (in Q1 and Q3) before dropping below 10% in late November, where it has since languished below SOL. One reason why Cardano reached such levels early was the lack of L1 alternatives in the market, as these were not developed until later in 2021. To assess whether ADA is undervalued depends on individual factors such as the level of development on the network (of applications such as liquidity pools, decentralized exchanges, etc.) and the TVL in those projects.

Total value locked on L1s as a percentage of ETH TVL



Source: DeFiLlama and Coinbase

We believe the measure of the network's broader adoption reinforces the blockchain's utility. For example, given Terra's sizable TVL, we might infer that its LUNA should have a higher "equilibrium" value, considering its market cap is only 7% of ETH's with a comparatively higher TVL. However, any view of whether such discounts are valid may also depend on investors' expectations about progress on improving ETH's speed, security, and scalability (see previous section). Note that we are not recommending specific protocols here; we are simply providing a framework for how to think about value in the crypto environment.



Volume patterns by time of day

Looking at patterns in daily liquidity² (with data aggregated by hour and by weekday), we observed some important information that could help institutional investors:³

- Daily trading volumes from Monday to Friday are almost twice as high as on Saturdays or Sundays. This is worth noting when trading over the weekends, when liquidity is thinner.
- Weekday peak volumes overlap with the U.S. equity trading and CME fixing windows (x-axis: 12-20h UTC), concentrating heavily in the 14-16h UTC time frame, capturing market opening hours in New York.

²Exchanges tracked for this analysis include Coinbase, FTX, LMAX Digital, Bitstamp, Kraken, Gemini, Bittrex, Binance US

³For more, see our report [Recurring Patterns in Crypto Liquidity](#), published December 7, 2021.

4.1

BTC/USD quote volume by hour/weekday (hour: UTC and US\$M)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Day total
Monday	\$92.9M	\$84.2M	\$76.6M	\$72.3M	\$64.1M	\$55.2M	\$56.8M	\$79.0M	\$74.8M	\$73.0M	\$73.1M	\$71.1M	\$99.4M	\$134.9M	\$139.3M	\$111.7M	\$119.1M	\$103.1M	\$84.0M	\$98.5M	\$103.2M	\$76.5M	\$74.2M	\$82.0M	\$2,098.8M
Tuesday	\$117.6M	\$91.3M	\$75.4M	\$75.7M	\$72.1M	\$57.1M	\$70.6M	\$66.6M	\$82.7M	\$68.0M	\$70.9M	\$73.1M	\$83.6M	\$115.8M	\$137.7M	\$117.2M	\$123.5M	\$91.8M	\$91.3M	\$97.4M	\$93.6M	\$76.9M	\$72.9M	\$70.9M	\$2,103.6M
Wednesday	\$97.2M	\$77.9M	\$71.7M	\$68.8M	\$63.6M	\$61.1M	\$64.5M	\$67.1M	\$80.0M	\$73.0M	\$85.4M	\$72.3M	\$97.2M	\$115.5M	\$126.3M	\$120.4M	\$121.2M	\$94.4M	\$113.7M	\$112.3M	\$93.2M	\$73.8M	\$72.6M	\$79.1M	\$2,102.4M
Thursday	\$104.5M	\$84.8M	\$72.6M	\$78.2M	\$74.3M	\$57.5M	\$58.3M	\$60.8M	\$70.8M	\$72.8M	\$68.5M	\$85.2M	\$100.3M	\$97.0M	\$120.2M	\$110.7M	\$109.6M	\$108.7M	\$116.4M	\$94.7M	\$98.9M	\$58.6M	\$58.8M	\$62.2M	\$2,024.5M
Friday	\$87.7M	\$83.8M	\$73.8M	\$61.0M	\$60.4M	\$54.4M	\$54.6M	\$91.4M	\$81.6M	\$66.7M	\$66.0M	\$65.2M	\$86.0M	\$115.3M	\$157.2M	\$135.9M	\$142.7M	\$90.5M	\$102.2M	\$83.8M	\$95.2M	\$73.8M	\$69.0M	\$68.1M	\$2,066.3M
Saturday	\$80.7M	\$54.9M	\$48.8M	\$48.7M	\$48.2M	\$49.0M	\$39.5M	\$42.7M	\$50.7M	\$47.1M	\$47.5M	\$54.8M	\$60.8M	\$60.3M	\$56.9M	\$56.6M	\$57.0M	\$57.5M	\$52.5M	\$47.3M	\$58.0M	\$45.3M	\$41.2M	\$53.9M	\$1,259.9M
Sunday	\$69.7M	\$49.1M	\$46.0M	\$48.9M	\$45.7M	\$37.6M	\$40.4M	\$38.3M	\$45.3M	\$42.4M	\$42.9M	\$42.6M	\$49.6M	\$48.0M	\$56.3M	\$51.2M	\$56.0M	\$49.6M	\$52.8M	\$52.7M	\$63.9M	\$56.7M	\$65.8M	\$71.8M	\$1,223.2M
Hour avg	\$92.9M	\$75.2M	\$66.4M	\$64.8M	\$61.2M	\$53.1M	\$55.0M	\$63.7M	\$69.4M	\$63.3M	\$64.9M	\$66.3M	\$83.9M	\$98.1M	\$113.4M	\$100.5M	\$104.1M	\$85.1M	\$87.6M	\$83.8M	\$86.6M	\$65.9M	\$64.9M	\$69.7M	

Period January 1, 2021 to December 31, 2021. Source: Coinbase Analytics

ETH/USD quote volume by hour/weekday (hour: UTC and US\$M)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Day total
Monday	\$75.6M	\$59.5M	\$48.6M	\$52.4M	\$49.5M	\$38.2M	\$38.8M	\$46.1M	\$48.3M	\$46.6M	\$43.7M	\$40.1M	\$67.3M	\$72.4M	\$83.7M	\$75.3M	\$100.8M	\$69.2M	\$60.3M	\$64.4M	\$74.9M	\$53.1M	\$51.3M	\$58.1M	\$1,407.9M
Tuesday	\$80.7M	\$62.8M	\$47.9M	\$50.9M	\$48.6M	\$40.0M	\$44.7M	\$44.6M	\$56.1M	\$51.3M	\$51.2M	\$47.4M	\$70.2M	\$70.3M	\$94.0M	\$79.7M	\$91.1M	\$64.4M	\$70.1M	\$68.9M	\$72.4M	\$52.3M	\$54.9M	\$57.7M	\$1,472.1M
Wednesday	\$64.8M	\$57.4M	\$52.5M	\$55.4M	\$50.3M	\$43.8M	\$42.6M	\$40.9M	\$48.1M	\$43.8M	\$42.8M	\$46.4M	\$65.6M	\$67.7M	\$86.3M	\$96.7M	\$99.6M	\$71.1M	\$82.2M	\$71.6M	\$77.9M	\$55.6M	\$56.5M	\$58.6M	\$1,478.2M
Thursday	\$80.3M	\$54.3M	\$47.8M	\$55.5M	\$45.9M	\$34.5M	\$36.6M	\$38.4M	\$52.4M	\$36.8M	\$43.0M	\$42.6M	\$65.0M	\$67.7M	\$79.5M	\$79.1M	\$79.4M	\$67.9M	\$71.1M	\$59.0M	\$61.6M	\$50.1M	\$47.9M	\$51.6M	\$1,347.9M
Friday	\$66.5M	\$59.0M	\$51.3M	\$47.1M	\$40.5M	\$36.5M	\$34.7M	\$54.1M	\$53.5M	\$41.2M	\$42.2M	\$45.0M	\$56.3M	\$74.3M	\$99.2M	\$86.8M	\$80.8M	\$64.0M	\$62.2M	\$54.4M	\$73.2M	\$48.7M	\$42.7M	\$44.7M	\$1,358.8M
Saturday	\$58.2M	\$44.6M	\$40.4M	\$35.5M	\$35.0M	\$32.1M	\$28.2M	\$26.7M	\$29.4M	\$29.7M	\$30.9M	\$31.8M	\$38.8M	\$37.8M	\$36.4M	\$41.4M	\$51.3M	\$43.1M	\$34.9M	\$37.4M	\$51.4M	\$38.6M	\$39.6M	\$39.6M	\$912.8M
Sunday	\$53.1M	\$39.9M	\$33.8M	\$36.3M	\$30.9M	\$28.1M	\$28.1M	\$26.2M	\$29.0M	\$27.2M	\$28.1M	\$27.8M	\$28.9M	\$35.9M	\$39.8M	\$42.2M	\$43.4M	\$35.8M	\$34.7M	\$40.1M	\$45.9M	\$47.2M	\$51.9M	\$55.0M	\$889.3M
Hour avg	\$68.5M	\$53.9M	\$46.0M	\$47.6M	\$43.0M	\$36.2M	\$36.2M	\$39.6M	\$45.2M	\$39.5M	\$40.2M	\$40.2M	\$54.6M	\$60.9M	\$74.1M	\$71.6M	\$78.0M	\$59.4M	\$59.4M	\$56.6M	\$65.3M	\$49.4M	\$49.3M	\$52.2M	

Period January 1, 2021 to December 31, 2021. Source: Coinbase Analytics

A major theme observed in our institutional practice in 2021 was a much broader range of client types seeking to engage with crypto.

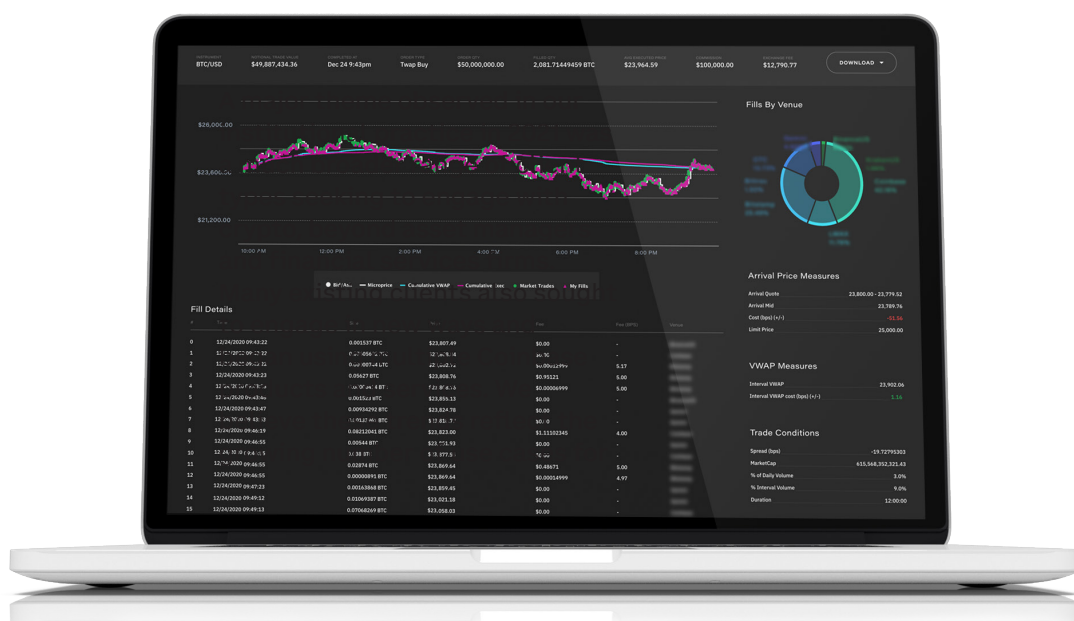
Coinbase Institutional update

Coinbase's institutional practice saw sustained growth across both of its core segments in 2021. These are:

- Our institutional investor business, in which asset managers directly participate in crypto markets via Coinbase Prime
- Our introducing-broker business, in which other companies use our APIs and white labeling to develop their own crypto products and services

Marquee partners added in 2021 included PIMCO in the former segment, and Meta and Enfusion in the latter.

The Prime Broker interface – post-trade TCA report



Coinbase Prime Broker aggregates liquidity from multiple exchanges and market makers and routes orders algorithmically as smaller trades to find the best all-in prices.

A major theme observed in our institutional practice in 2021 was a much broader range of client types seeking to engage with crypto, beyond asset managers and financial services firms. Many existing clients also sought to engage in new ways and began using multiple Coinbase products and services. We believe these trends reflect the growing number of use cases for crypto.

5.1

While 2019 and 2020 were dominated by financial investment activity, 2021 may have marked the start of crypto’s mainstream “utility” phase, enabled by the maturing of smart contract-equipped L1 and L2 networks, widespread adoption of NFTs, and heightened demand for crypto payment capabilities. Specific areas that saw heightened engagement in 2021 included gaming, e-commerce, payments, social media, donations, media and art, and consumer brands.

Our institutional practice aims to provide a “one-stop shop” for all major crypto use cases. To this end, we continue to expand our product portfolio and team. Our product portfolio now spans:

coinbase PRIME

Flagship prime brokerage platform, combining multi-venue algorithmic trade execution for 90 pairs, custody, financing, and market data analytics

coinbase EXCHANGE

Direct access to Coinbase’s central-limit two-sided order book

coinbase ASSET HUB

Platform for asset issuers to receive trading and custodial support from Coinbase

coinbase EARN

Distribution platform for asset issuers, enabling users to be paid to learn about their asset

coinbase ANALYTICS

Crypto compliance for governments, financial institutions, and crypto businesses using on-chain data analytics

coinbase CLOUD

Manage staking services and blockchain infrastructure

coinbase COMMERCE

Platform enabling merchants to accept and manage crypto as a payment method

We have also begun to roll Coinbase Custody into the flagship Coinbase Prime platform.

We continued to grow our headcount across our Institutional practice in 2021 to better serve our evolving client base. Coinbase’s institutional practice also expanded our specialist sales team to support our Asset Hub, Earn, Analytics, Cloud, and Commerce capabilities.

In addition, we launched a new technical account management team to better assist introducing-broker clients who are integrating with our APIs to build their own crypto products.

ETFs

In 2021, ETF issuers continued to pursue spot BTC products, anticipating long-awaited SEC approval. Coinbase worked with many of these issuers, as well as traditional securities custodians, to create end-to-end workflows for products with cash and in-kind funding.

Coinbase will continue to [advocate](#) for spot crypto ETF approvals. We aim to be the most trusted partner to issuers and traditional custodians seeking to participate in this new market.

Hedge funds

Hedge funds have been active participants in crypto markets for a number of years, but in 2021 we observed more diversity in the types of funds entering the space as well as in the strategies these funds employed.

In addition to macro- or systematic-focused players looking to engage in crypto, newer partners on our platform include traditional equity long-short funds, credit funds, and crossover funds (those with investments ranging from VC to liquid tokens).

Hedge funds are moving past “buy and hold” strategies. Notable trends from this year included quant firms looking to profit from cross-exchange arbitrage opportunities, yield-farming strategies focused on DeFi, and even NFT-specific funds who see the burgeoning market as a scalable trading opportunity.

Moving ahead, hedge funds will continue to prove themselves capable of flexibility, setting the stage for more of them from all walks of life to enter crypto markets in 2022.

OEMS platform partners

As larger and more sophisticated institutional investors entered the crypto markets in 2021, many sought to streamline their execution, portfolio management, and reporting capabilities so their crypto operations could more closely mirror other asset classes. To assist this, Coinbase launched its new Order and Execution Management System (OEMS). This allows investors to manage their crypto on Coinbase Prime via their preferred OEMS vendor. We began this program by [partnering](#) with Enfusion, a leading OEMS provider.

Our institutional practice aims to reduce friction as much as possible for clients scaling up crypto activity. We are agnostic about methods of “last mile” consumption for our products and services, and will continue to pursue partnerships that enable broad, seamless access to crypto.

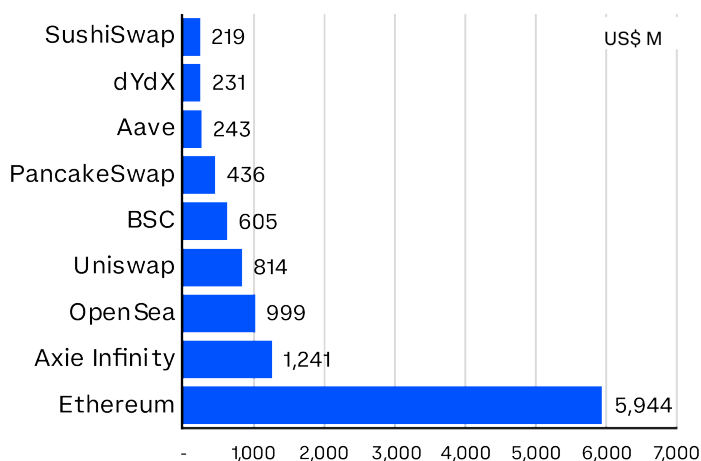
Enter the metaverse: navigating the fog of hype

'Metaverse mania' begins

The metaverse is still in its nascent stages and will take time to mature, but the shift from Web 2.0 to Web 3.0 presents long-term opportunities for crypto networks and blockchain technology, which we have previously discussed [here](#). The gaming sector is already at the vanguard of this movement, popularizing virtual-world concepts, led by Axie Infinity, Roblox and Unity, to name just a few. Indeed, fee revenue generated by Axie Infinity is second only to the Ethereum blockchain.

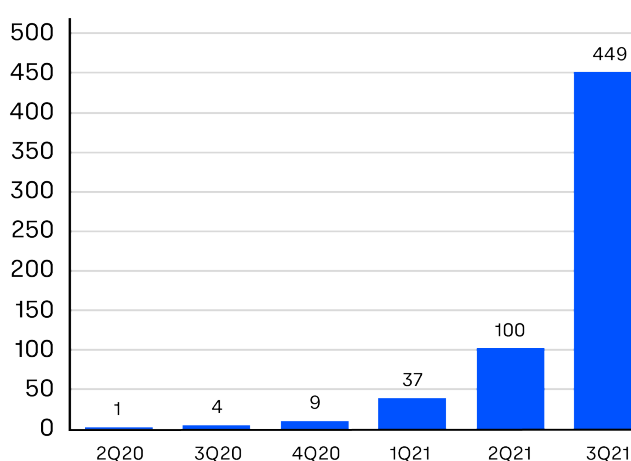
Many large, established brands have already started to pay lip service to the metaverse through marketing or other initiatives without making meaningful capital allocations or repositioning business models. Mentions of the "metaverse" during third-quarter earnings conference calls surged by 349% sequentially and over 1,100% year-on-year after Facebook's [announcement](#) that it would pivot to a metaverse company and change its name to Meta, according to analysis by Bloomberg.

Total revenue by protocol (180 days)



Source: Token Terminal

Metaverse mentions in earnings calls



Source: Bloomberg

What is the metaverse?

Metaverse evangelists see it as the internet's next phase — an immersive virtual world powered by real-time 3D software, accessible from any device, where users with avatar-based identities gather for concerts, live events, networking, business, education, esports, gaming, etc.

In contrast to the walled-off nature of Web 2.0, the metaverse is expected to host decentralized, open networks to participate in virtual economies. This will feature interoperability — seamless movement between virtual worlds with avatars, crypto wallets, NFTs, and many other digital assets.

Virtual economies, fueled by NFT gaming, are key to many metaverse-style video games, as are play-to-earn models where participation is rewarded with tokens. Such games are a platform for initiating the next generation of crypto users, which Coinbase Ventures discusses [here](#).

Meanwhile, blockchain technology is the DNA of the metaverse. Several existing and emerging projects are built on layer 1 platforms such as Ethereum, Solana, and Avalanche, while layer 2s including Polygon, Immutable, and many others are being used for scaling.

Metaverse cryptocurrencies

Facebook's Meta announcement drove a rally in metaverse cryptocurrencies in November and December, driven by retail and institutional investors. MANA, the native token for Decentraland, a web-browser-based virtual network, surged 330% between October 28 and December 31, 2021. Sandbox, an Ethereum-based virtual gaming platform, saw its SAND currency spike 688% over the same period. And GALA, another Ethereum token that powers its blockchain-gaming platform, jumped by 527%.

Virtual real estate is another feature of metaverse projects. A plot of virtual land in Decentraland sold for 618,000 MANA (about \$3.2 million) in November. Later that month, real estate in Axie Infinity sold for 550 ETH (\$2.5 million at the time). Even actual countries are dipping their toes into the metaverse — Barbados [announced](#) an accord with Decentraland, becoming the first sovereign nation to establish a "metaverse embassy."

Institutional focus

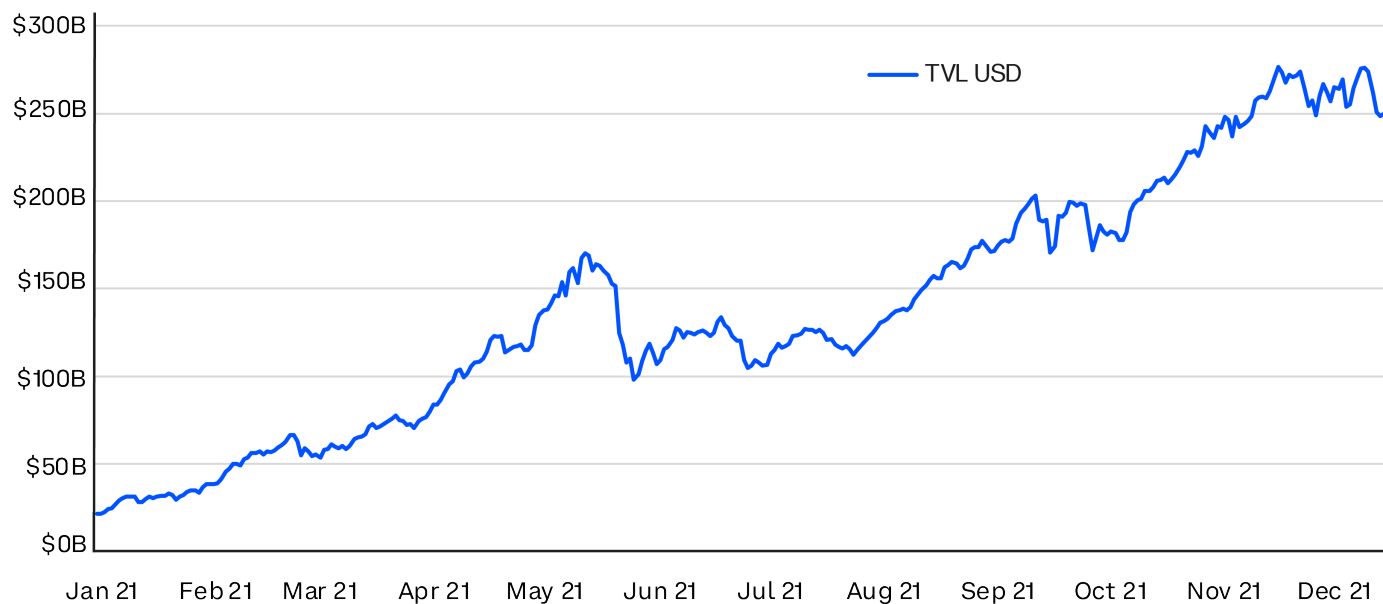
Institutional attention on the metaverse is intensifying. Analysts at Bank of America, Jefferies, and Morgan Stanley have published research noting increased market interest. Bloomberg Intelligence expects the metaverse's total addressable market to double to \$800 billion by 2024. Even ETFs have [joined the race](#), tracking global tech firms in the space.

Overall growth

The predominant DeFi story this year has been growth. The total value locked in DeFi protocols has jumped from about \$17 billion at the start of the year to around \$250 billion by the end, according to DeFiLlama.

Much of this has flowed into two primary segments: lend/borrow protocols (such as Aave and Compound) and decentralized exchanges (such as Uniswap and Curve). Decentralized exchanges (DEXs) as a whole have amassed more than \$1 trillion in cumulative volume over the past year, with Uniswap taking the lion's share.

While this is still not quite at centralized exchange levels, especially when compared to exchanges with perpetual swap and futures volumes, there have been days when Uniswap volume has surpassed Coinbase volumes.

Total value locked across L1s amounted to \$250 billion at end-2021

Source: DeFiLlama

Different layers of DeFi segmentation

Over the course of 2021, the DeFi sector as a whole generally split into several high-level segments:

- **DeFi 1.0:** “blue chip” ETH DeFi applications such as Uniswap, Compound, Aave, Synthetix, and Yearn Finance
- **DeFi 2.0:** advanced-yield-generation and structured products such as Ohm, Convex, Ribbon, and Dopex
- **Alt L1 DeFi:** conventional clones and forks of DeFi primitives such as AMMs, and lend/borrow protocols on alternative layer 1 blockchains such as Orca on Solana, Trader Joe on Avalanche, and Astroport on Terra

The year started with a rising ETH rally that lifted DeFi 1.0 native governance tokens along with it (from their slump at the end of 2020). As the year progressed, however, interest in these “legacy” tokens waned as traders became more fascinated with new financial primitives and yield-generation products such as Olympus Finance (OHM) and Convex (CVX).

These DeFi 2.0 apps were primarily launched on mainnet Ethereum. While they offered novel financial gameplay and often large yields, when network congestion rose (along with the burgeoning trend of [MEV](#)), regular retail users were largely priced out of the network by exorbitant fees, often exceeding \$50 for a moderate DeFi interaction on-chain.

This limitation of mainnet Ethereum opened the door for new layer 1 blockchains to take more DeFi market share. As several extremely [large DeFi incentive](#) programs were announced, more developers deployed forked or cloned versions of popular DeFi primitives (such as decentralized exchanges, aggregators, yield farming and lending/borrowing protocols) on newer and far less expensive chains (such as Solana, Luna, and Avalanche).

This started a trend in the second half of the year: large amounts of new users and TVL started to move to DeFi applications on new chains. Ethereum’s share of DeFi TVL went from nearly 99% at the start of 2021 to about 60% at the end. This coincided with a price slump in DeFi 1.0 coins.

OHM and the rise of ‘protocol-owned liquidity’

While two key DeFi primitives — overcollateralized lending/borrowing and automated market makers (to run decentralized exchanges) — had been largely brought into the mainstream in 2020, a new trend emerged in the DeFi sector in 2021 with a potentially lasting effect. This was “protocol-owned liquidity,” pioneered by Olympus, the project behind the popular OHM token.

OHM is best known for its enormous yield numbers (well over 1,000% APY for most of the year). But its real innovation was introducing a sustainable way to generate that yield: using fees and user vesting of discounted OHM to own progressively more users’ LP tokens (representing liquidity for different pairs such as OHM-DAI, for example) in the project’s treasury.

This treasury of LP tokens (or protocol-owned liquidity) can be used as a source of protocol revenue (from trading fees on the liquidity) and as a backing or floor for the asset itself, giving it a fundamental underlying value.

This underlying dynamic, and the Olympus protocol itself, was forked numerous times across multiple chains, as well with TIME for Avalanche, Invictus for Solana and so on.

The curve wars

Another major trend in DeFi last year was the rising dominance of [Curve Finance](#). Curve started as a stable-swap-focused DEX, with an emphasis on maintaining an efficient price curve on which to pool and swap different variations of stablecoins and pegged assets.

7.2

This differentiated it from Uniswap's general-purpose AMM model. The lack of any [impermanent loss](#) in pooling stablecoins, as well as the extra yield offered on top in CRV tokens, allowed Curve to amass a large amount of locked value. It is now the single largest DeFi application in terms of TVL, with more than [\\$23 billion](#) locked in its protocol.

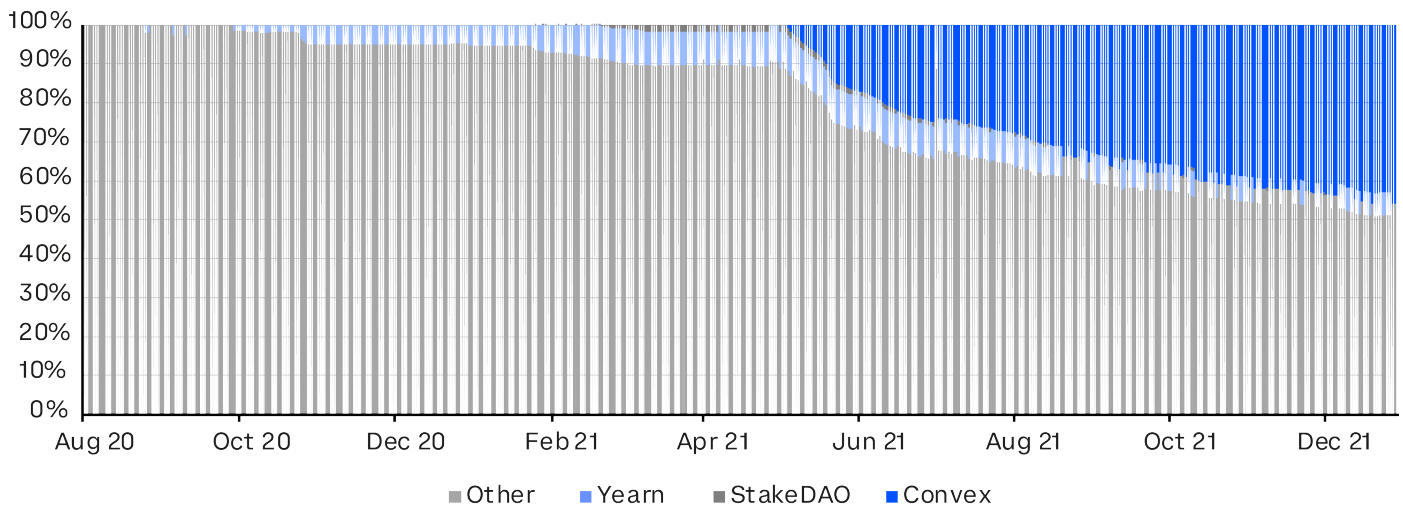
This large amount of TVL has enabled Curve to attract a virtuous flywheel of new stablecoin and pegged-asset issuers wanting their tokens LP live on the protocol. The difference with Curve's tokenomics is that they offer CRV token holders the ability to lock up their tokens for up to four years and receive veCRV in return; veCRV represents a locked curve that gives voting rights to decide which pools CRV emissions go to.

At the end of 2021, as new algorithmic stablecoin and pegged-asset projects (such as OHM, FRAX, and UST) have rocketed in popularity, we have seen protocols and projects vying for more CRV emissions for their pools, to generate more yields for users and incentivize a liquidity flywheel.

This has become known as the "curve wars." A key player here is a protocol called [Convex Finance](#), which allows for staking of liquidity with the option of boosted rewards because the protocol itself progressively buys out and owns more veCRV over time (see chart below).

As such, protocols now fight for Convex governance rights in order to have a say in where CRV emissions go — a derivative battle being fought between several billion-dollar protocols today.

veCRV Share by DAO



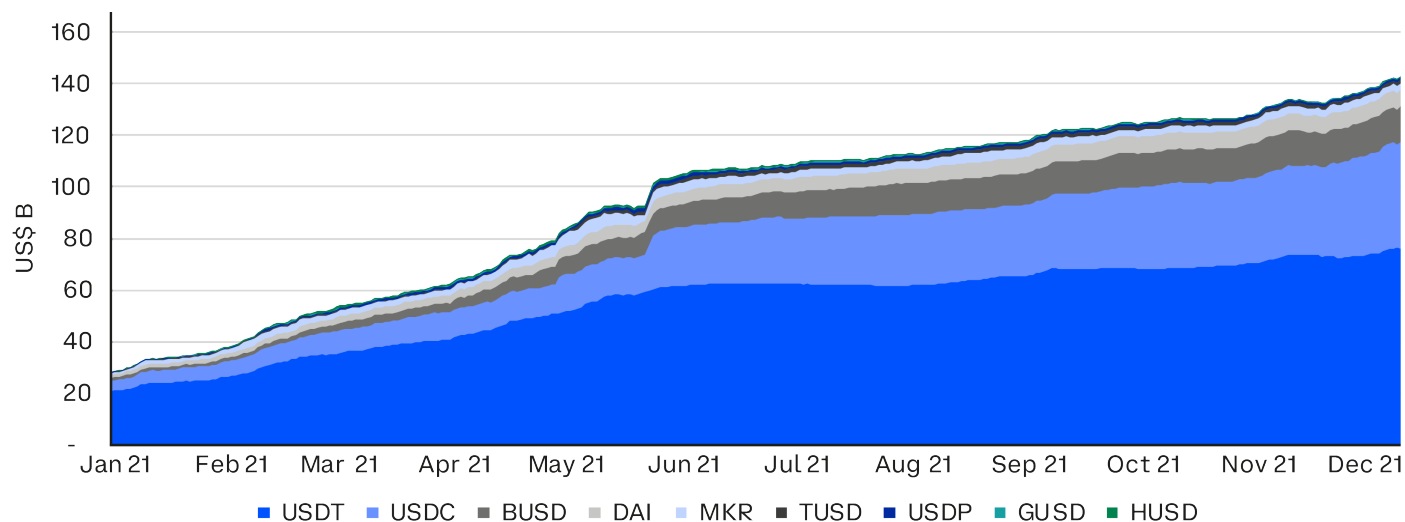
Source: [dune.xyz](#)

The market capitalization of the largest stablecoin issuers grew by around 435% in 2021 from \$28 billion to over \$150 billion based on our Skew database, as uses for these assets became more evident, particularly among crypto natives. Stablecoins have a crucial role as intermediaries when exchanging different coins or tokens, or as a place to park funds when market volatility increases. They are also used as collateral for DeFi transactions and to settle derivatives (e.g. futures contracts).

According to [The Block](#), about 73% of all trading volumes on centralized exchanges in December 2021 involved stablecoins.⁴

However, it's important to separate different categories of stablecoins — they include fiat-backed stablecoins, algorithmic stablecoins, crypto-collateralized stablecoins. You can find a summary of these categories [here](#).

Market capitalization of major stablecoins



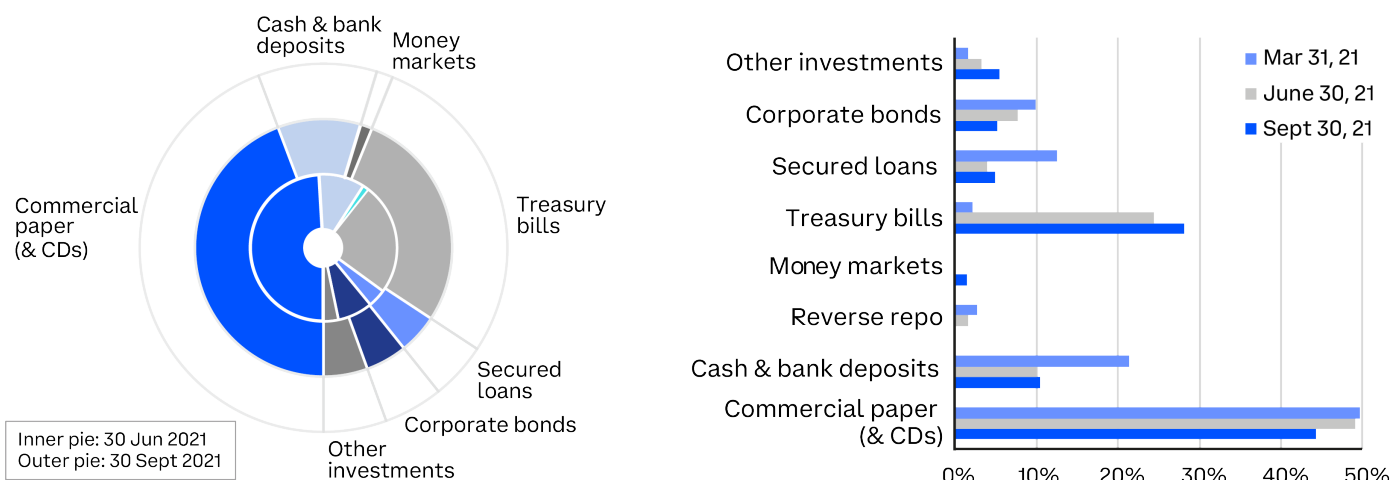
Source: Skew and Coinbase

The two largest stablecoins — Tether (USDT), with a market cap of \$78.4 billion, and USD Coin (USDC), with \$42.3 billion – are fiat-based and together make up 82% of all stablecoins, according to Skew. In 2021 regulators took a close interest in fiat-backed stablecoins. On November 1, the U.S. government's ["Report on Stablecoins"](#) addressed important structural risks — principally, how do you prevent any mass redemption of certain coins destabilizing short-term credit markets and harming the wider economy?

⁴Exchanges used in this metric include Binance, Poloniex, Bitfinex, Huobi, OKEx, Bittrex, Coinbase, Kraken, Bitstamp

Rating agency Fitch highlighted Tether's potentially higher-risk reserve assets as an example of this danger in a [report](#) on July 1, 2021. It highlighted how the coin's considerable position in commercial paper (CP), about \$30.8 billion at the time, could push credit spreads wider if it had to sell its position, potentially causing a downward spiral of USDT withdrawals. It alleges this could have very bad ramifications for cryptocurrencies as an asset class, if not the wider financial system.

Tether holdings as at end Q3 2021



Source: Tether, Moore Cayman, and Coinbase

However, we think the latest independent accountant's [report](#) on Tether's holdings, from Moore Cayman, points to some positive developments on this front. For example, it reports that Tether reduced its CP holdings from 49% on June 30 to 44% by September 30.

Tether's CP is mainly rated at A3 and above (with only \$500 million classified as "other"). This means that, even if it had owned any short-term liabilities associated with weak sectors, such as [Chinese real estate](#), it would no longer be in their portfolio, as rating agencies have downgraded much of that debt to sub-investment grade over the past year.

Also, Tether's CP holdings all have maturities of one year or less. This means, depending on how the ratings were revised in 2020-2021, that Tether would have extremely limited exposure to that risk, as it can probably hold this paper until maturity, avoiding mark-to-market losses, according to our calculations.

The regulatory landscape: U.S. primed for more clarity in 2022

In the U.S. the crypto regulatory landscape has continued to mature. But there are still many areas where regulatory clarity can and should be provided. This year more than ever, the crypto community is primed to work with legislators and regulators to provide this, paving the way for further adoption, innovation, and growth.

Regulators' engagement with crypto has shifted, and they now broadly view it as a geopolitically and systemically important trillion-dollar asset class. This helps remove doubt over crypto's permanence but may increase scrutiny, which could hinder the development and adoption of innovations and novel uses for digital assets.

For 2022 to build on the momentum of this past year, it is imperative that regulators approach crypto with balanced engagement, appropriately weighing burdensome oversight with valuable clarity.

We can all ensure this balance is maintained by remaining aware of developments and continuing to engage legislators and regulators through direct outreach and comment letters. At Coinbase we will try to make this easier through insight pieces, as well as by advocating for the industry publicly and privately.

The arc of the regulatory landscape is long but bends towards progress

Reflecting on the crypto regulatory landscape at the beginning of 2021 and where it is now, it has clearly moved in a positive direction.

In late December 2020, there was a push to impose burdensome self-hosted wallet reporting regulations that were to be implemented in early January. This was eventually forestalled in favor of a more contemplative approach.

This followed a similar experience in September 2021, when an overly broad definition of "broker" for digital assets was included in the Congressional infrastructure bill. This spurred the crypto community into action, creating a standoff that almost derailed the Infrastructure bill, an important piece of legislation. The definition ultimately remained, but the community was galvanized.

A Congressional hearing in December that summoned a handful of influential crypto company executives (including Coinbase's CFO [Alesia Haas](#)) confirmed crypto's arrival in Washington DC. In a four-hour hearing, members of Congress asked thoughtful questions and were actively engaged. This shows how far the quality of regulatory engagement has advanced over the past year.

These vignettes exemplify crypto's positive trajectory in Washington DC:

- In December 2020, the industry was caught off-guard by potential new regulations.
- Towards the end of the third quarter 2021, the industry showed its influence by coalescing around a single issue, specifically the categorization of "broker" in the infrastructure bill.
- Coinbase launched its [Digital Asset Proposal](#) (#dApp), a comprehensive effort to inform the federal conversation on thoughtful and fit-for-purpose digital asset regulation in the United States
- Finally last December, in a Mr Smith Goes to Washington moment, the industry had a seat at the table to help shape its future.

Jurisdictional questions abound

Much still has to be done. Myriad governmental organizations are jockeying for regulatory relevance in the digital asset space.

As the dust settles and truces are reached, there is likely to be an overlapping but deferential jurisdictional approach — similar to how a financial instrument can be both a commodity and security, or how a bank can carry out brokerage activity.

Two jurisdictional stances to keep in mind are those among federal agencies and between state and federal authority.

Among federal agencies

The change of presidential administrations brought a bevy of new characters and influencers to Washington DC. The background of incoming staff prompted some unsubstantiated optimism, but in reality the crypto regulatory turf is still being marked out.

A good example is between the U.S. Securities and Exchange Commission (SEC) and the U.S. Commodities Futures Trading Commission (CFTC). New SEC chairman Gary Gensler has repeatedly asserted that the SEC has plenary authority over securities, and that most crypto tokens are in fact securities. To make this point, he has pointed to *Howey*, a decades-old precedent that broadly defines a security.

This would seem to indicate that most crypto activity should fall under the SEC. But the CFTC has explicitly stated that BTC is a commodity, and new CFTC chairman Rostin Behnam has [stated](#) the CFTC was the rightful "primary cop" of crypto.

Until either agency — or a new agency — issues a comprehensive regulatory regime that takes into account crypto's distinct characteristics, there will be uncertainty.

In the meantime, regulation by enforcement, the prevailing but imperfect method to date, may continue. A number of significant cases have indicated that proper disclosure and process are necessary for issuers and intermediaries of crypto. Furthermore, the pending Ripple case looms large in the coming year.

Between state and federal authority

In the absence of clearer guidance, some states have attempted to fill the void — with mixed results — and federal authority has often asserted itself in light of novel state actions.

For example, in late 2020 Wyoming issued guidance on a trust company's status as a qualified custodian. The SEC [responded](#) that providing guidance in this space was their jurisdiction. This happened again this November, when two organizations that had followed Wyoming guidance to create a decentralized autonomous organization (DAO) filed registrations of their tokens as securities. The SEC stopped these filings, claiming they were [materially deficient](#).

How to interpret last year's regulatory developments

With this infighting and finger-pointing, it would be easy to believe no progress is being made. But, reviewing regulatory action over stablecoins and BTC ETFs demonstrates the incremental progress that is consistently occurring within the crypto space.

Stablecoins: Tether and beyond

Tether, the world's largest stablecoin, started 2021 under significant regulatory scrutiny. It, and the stablecoin industry generally, ended the year with more clarity and oversight, creating an environment for future growth.

Stablecoin regulation is a good example of how various federal regulators along with state regulators can approach a similar concern and build on the actions of each other. This trend is likely to continue into 2022.

Tether began 2021 with its operations and disclosures under investigation by the New York Attorney General (NYAG). In [February](#) it reached a settlement with the NYAG for \$18.5 million in penalties, increased disclosure and a bar on activity in New York.

Separately from this state investigation, a President's Working Group (PWG) was convened, led by the Treasury and including representatives from various federal regulators. Its purpose was to understand the systematic implications of stablecoins, given their significant growth and the lack of consistent regulatory oversight in the space.

In November, the PWG [published](#) its findings in a report, recommending additional legislative action. The industry's response has been to apply recommended disclosure independent of further regulatory action.

The stablecoin industry's response to both the state action and the PWG should be instructive in addressing regulatory concerns through pre-emptive action, responsive to concerns, enabling continued flourishing of the crypto economy in the coming year.

BTC ETFs are an incremental step in the right direction

The key takeaway from the approval of various futures BTC ETFs and the continued disapproval of direct BTC ETFs is to listen to signals from regulators whenever provided. Signals are often subtle and come in many forms: these include speeches, testimony, interpretative statements, and enforcement actions. It should be assumed that all actions taken by a regulator are deliberate and therefore are valuable in understanding their opinions and interpretations or any change thereof.

The tacit approval of the futures BTC ETF came only after SEC Chairman Gary Gensler signaled he would be receptive to a futures BTC ETF. In August, he made a [speech](#) that stated a futures-based ETF, subject to the Investment Company Act, would meet the necessary investor protections to be an exchange-traded financial product. The futures-based BTC ETF applications were only filed after this signal of comfort from the SEC, and were given the green light to trade in October.

A direct BTC ETF has yet to receive this sort of signal; in fact, outward statements thus far have been the opposite. Specifically, Chairman Gensler continues to generally analogize the crypto market to the “wild west.” Until he retires the wild west metaphor or a superseding signal is provided, it is unlikely that a direct BTC ETF will be approved by the SEC.

International regulatory landscape presents an opportunity for the U.S.

The international crypto regulatory landscape offers an encouraging albeit disjointed review for 2021. At one extreme is China, which through a series of actions made mining and transacting in crypto illegal. At the other is El Salvador, which rolled out a crypto wallet app and adopted BTC as its legal tender in September.

These extreme approaches belie the numerous and varied efforts to address cryptocurrencies across the globe. This presents an opportunity for U.S. legislators and regulators to lean in and lead, creating globally recognized standards in the space, which can offer geopolitical and economic advantages and increased multilateral cooperation on the future of our digital economies.



The crypto industry's path toward a more sustainable future

International concern about the climate crisis has put responsibility on almost all the world's governments to act boldly to reduce greenhouse gas emissions. Efforts to meet the [Paris Agreement](#)'s aim of limiting global warming to 1.5 degrees Celsius above pre-industrial levels are likely to impact almost all industries, blockchain and cryptocurrency included.

The [environmental impact](#) of the crypto industry came under particular scrutiny this year, with focus on BTC mining's carbon footprint. But the industry also made its own [call to action on climate change](#), seeking to lead efforts on decarbonization.

Critical issues remain for the crypto industry — like nearly all industries — to address if it is to align with global efforts on climate change. But there is momentum behind decarbonization, and the outlook for further green innovation is encouraging.

The global response to climate change

COP26, the Glasgow conference held in October and November (more properly, the 26th Annual Conference of Parties to the United Nations Framework Convention on Climate Change), agreed to the [Glasgow Climate Pact](#), mapping out a plan for global climate action.

Its most significant provision is perhaps reaffirming the Paris Agreement's commitment on global warming, with nations agreeing carbon emissions must be cut by 45% by 2030 to meet the 1.5 degrees Celsius target. However, what has been seen as one of its main [failures](#) was to dilute the goal of "phasing out" unabated coal power to "phasing down", after objections from China and India.

So although there is a more unified global commitment on climate change after COP26 than at any point in history, the path towards an emissions agreement will not be straightforward. There will be roadblocks and detours for both global leaders and the private sector — because their interests are in competition.

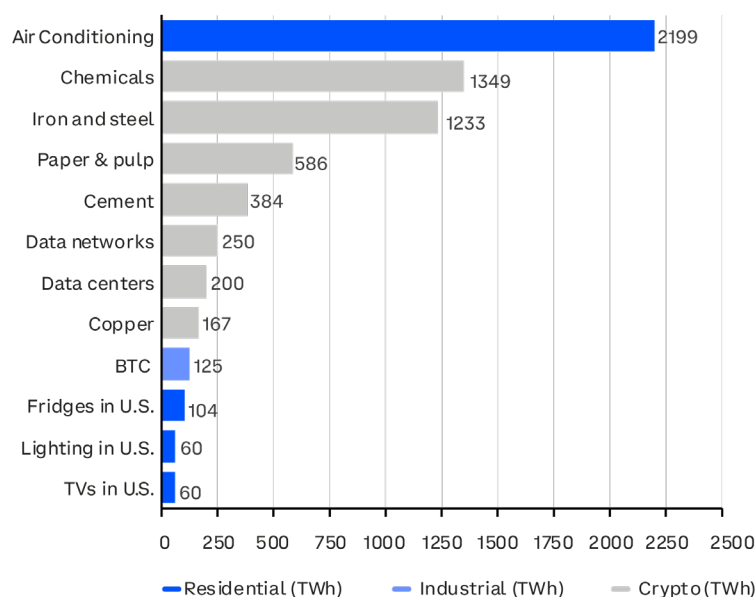
Crypto's carbon footprint

We expect the crypto industry to continue making efforts to green its own house, and that means further investments in sustainable solutions.

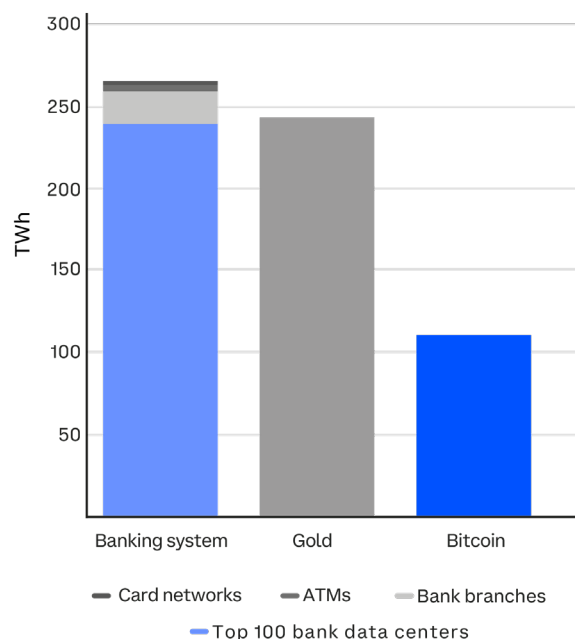
But before looking at developments that should reduce crypto mining's (and more specifically, BTC's) carbon footprint, it would be helpful to be able to put crypto's energy use and emissions in context. However, as noted by the [Cambridge Bitcoin Electricity Consumption Index](#) (CBECI), because BTC is "many things to many people," there isn't really an apples-to-apples method to compare the energy consumption of two forms of transportation.

However, the CBECI does provide a comparison between the energy consumption of BTC compared with other energy-intensive end uses. The data in the following chart are in terawatt-hours (TWh):

Annual world electricity consumption by sector



Source: Cambridge Bitcoin Electricity Consumption Index



Source: Galaxy Digital

BTC mining is actually at the lower end of the spectrum. Only lighting, TVs and fridges in the U.S. use less electricity. Meanwhile, a [study](#) released by Galaxy Digital in May showed that the traditional banking sector actually consumes a significant amount more energy than the Bitcoin network.

But developments within crypto should accelerate moves towards an even more sustainable profile. For instance, ETH — the second largest cryptocurrency by market cap — is [upgrading](#) from a proof of work system to the more energy efficient [proof of stake](#). This will make a vast range of [crypto economic activities](#) greener — including lending, saving, minting, and NFT development.

China's ban on BTC mining this year drew headlines that focused on what it would mean for BTC's price (which [weathered](#) it just fine). But we believe Beijing's crackdown will benefit the [net zero goal](#) as miners move to places, [including the U.S.](#), with a greater mix of renewable energy. In fact, since China's ban on (the often coal-powered) mining, the U.S. has now become the world's leader in total [hashrate](#) as of Aug. 2021, according to Cambridge.

This leads to an even larger point: all proof of work blockchain mining, including BTC's, is powered by the global energy mix. And as that mix becomes more renewable, Bitcoin mining will become cleaner.

Coinbase and the environment

Coinbase's own carbon footprint is small — especially as a [remote-first](#) company.

One lever Coinbase can use to improve the crypto industry's carbon footprint is through investments made via [Coinbase Ventures](#). This includes its [investment](#) in [Crusoe Energy](#), which has developed an innovative way to combat greenhouse gas emissions by capturing flares from oil patches and using the excess energy for BTC mining.

Leading decarbonization efforts

As both governments and the private sector take bolder action on emissions, the crypto industry remains well positioned to [lead](#) decarbonization efforts. However, it must also acknowledge where it falls short on sustainability issues — including BTC mining’s current carbon footprint.

Future steps towards embracing cleaner energy should include:

- Maintaining high-quality, transparent data about electricity consumption and energy mix
- Developing an ESG reporting and ratings framework tailored to crypto
- Building constructive relationships with policymakers to create meaningful and achievable environmental targets
- Where feasible, investing in renewable energy projects

The global transition to embracing ESG issues, including renewable energy, could reach the same scale as the digital transformation that has revolutionized both business and our personal lives. What was once a “nice to have” will become a financial necessity.

We expect 2022 to bring more data and transparency around the carbon footprint of BTC and other cryptocurrencies. And while much work remains to be done to bring us closer to net zero, we expect the crypto industry to continue to invest in the solutions that will get us there.

Coinbase Ventures was launched in 2018 with a mandate to support the growing crypto ecosystem. We believe innovation will come both from within and outside Coinbase, and look to invest in the leading teams and projects pushing crypto forward. Since its launch, Coinbase Ventures has been one of the most active investors in crypto by deal count, and one of the most active corporate investors overall.

Coinbase Ventures currently has more than 200 portfolio companies, with nearly 150 added in 2021 alone, averaging a deal every ~2.5 days. Cumulatively, more than 90% of the capital invested by Ventures was and more than 50% of the new unique "[logos](#)" in the portfolio came in 2021, reflecting an accelerating pace in our fourth year of operation.

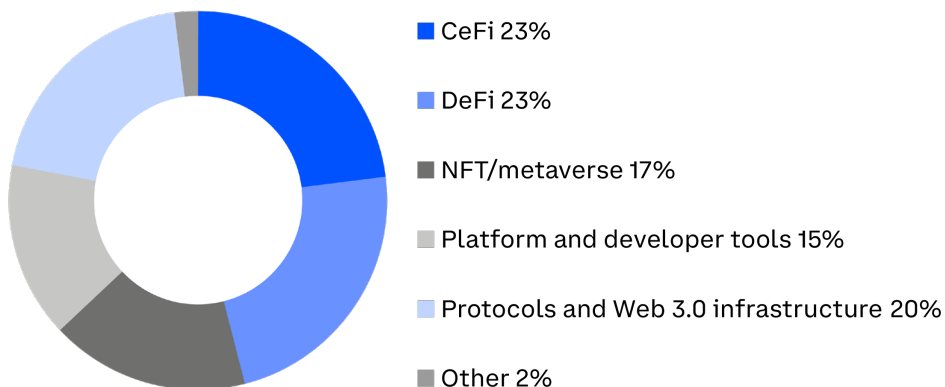


Investment categories

Coinbase Ventures investments range from six-figure seed deals to multimillion-dollar growth rounds. There are many ways to slice our investments, but at the highest level, we break the market down into the categories described in our pie chart below.

Our current distribution of total investments by company is as follows:

Deal by product area



Key themes

2021 was a watershed for crypto as talent and capital inflows unlocked massive momentum to build. Each quarter taught our team something new.

In **Q1** the strongest activity was in the areas of Web 3.0, NFTs, DeFi, and emerging ecosystems such as Polkadot and Flow. We saw new venture capital entrants in the form of large-scale growth funds including Tiger Global and Coatue. We were active in investing in accounting and reporting solutions, DeFi aggregators, DeFi insurance, NFT infrastructure, and layer 2 and cross-chain solutions.

Q2 saw a wave of projects to usher in the NFT utility phase as well as unlocks in the DeFi space, particularly around liquid staking and wrapped assets. The Chinese mining ban shifted activity to North America. There was also increased investment activity surrounding regional exchanges, asset managers and brokers, privacy solutions, DeFi insurance, and DAO infrastructure.

In **Q3** Web 2.0 giants (Square, Twitter, Stripe) more actively started exploring crypto, the long-awaited BTC ETF was approved in the U.S., and Web 3.0 usability took center stage. Coinbase Ventures saw heavy deal flow across Web 3.0 infrastructure and data layers, data analytics, the intersection of NFTs and DeFi, gaming, music, and the growth of DeFi ecosystems outside Ethereum.

Q4 saw the explosion of crypto's application layer as DAOs made global headlines. Activity surrounding new Web 3.0 games and gaming guilds spiked, and new primitives emerged across non-EVM compatible ecosystems such as Solana, Polkadot, Terra, and Cosmos. Facebook's rebrand to Meta coincided with renewed interest and activity across a host of new metaverse applications and infrastructure.

The rising tide of crypto

Coinbase Ventures' primary mandate is to support the growing crypto ecosystem. As such, we invest broadly across the space in strong entrepreneurs who drive crypto forward. We want crypto to bloom but do not focus exclusively on specific outcomes (as is usual with corporate venture capital).

Ultimately, we see crypto as a rising tide, with growth in the ecosystem lifting all boats, Coinbase included. Traditional strategic benefits such as commercial partnerships and potential M&A are great, but we view them as icing on the cake.

Looking forward to 2022, we are excited to continue investing in the highest-quality teams building crypto globally.



About Coinbase Institutional

Coinbase Institutional provides integrated solutions that marry our advanced trading platform, custody, and prime services. Institutional investors access all the tools they need, from staking and governance to secure cold storage, via Coinbase Prime, our prime brokerage platform. With Coinbase Prime, investors can easily manage their crypto in one place, execute large trades, and rely on high-touch support as they navigate digital assets.

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