cfbenchmarks
a kraken company

November 2024

Monthly Market Recap

BLOOMBERG <CFBX> GO

cfbenchmarks.com

cfbenchmarks
a kraken company

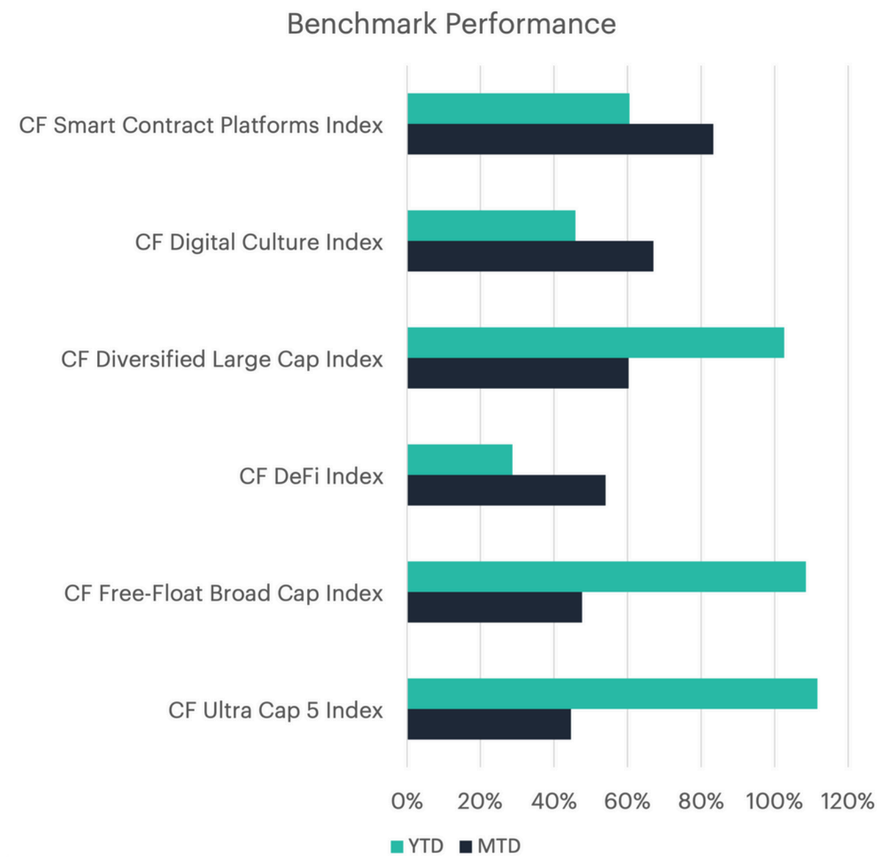
Table of Contets

cfbenchmarks
a kraken company

Market Performance

cfbenchmarks.com

Regulatory Re-Rating Rockets Bitcoin to New Highs



All index performance is rebased to 100.
Source: CF Benchmarks, Bloomberg, as of November 30, 2024

Market Summary

Bitcoin prices surged to nearly $100,000 following Donald Trump's U.S. presidential election victory. Expectations of pro-cryptocurrency regulatory changes drove market optimism, boosting demand for major tokens pairs and increasing investor interest in digital asset segments and categories that have historically lagged. The Federal Reserve implemented another 25-basis-point rate reduction, further enhancing the appeal of risk assets across the spectrum. The combination of political shifts toward a more accommodative regulatory regime and monetary policy easing has strengthened momentum for the digital asset class.

As a result, index gains showed broad participation with all flagship indices posting positive price performance. The CF Smart Contract Platforms Index led with +83.36%, followed by the CF Digital Culture Index at +67.09%. The CF Diversified Large Cap Index rose +60.33%, while the CF DeFi Index gained +54.01%. The CF Free-Float Broad Cap Index and CF Ultra Cap 5 Index showed more modest increases of +47.67% and +44.56% respectively, marking a notable reversal from previous underperformance across cryptocurrency market categories.

Gabe Selby, CFA
Head of Research

Mark Pilipczuk
Research Analyst

Major Crypto-Pairs

Name	Category	Sub-Category	Segment	1 Month	3 Month	1 Year	30 D Volatiltity
Stellar	Settlement	Non-Programmable	Store Of Value And Payment	468.7%	466.8%	343.7%	209.93
Algorand	Settlement	Programmable	General Purpose Smart Contract Platforms	288.9%	260.2%	231.9%	153.81
Ripple	Settlement	Non-Programmable	Store of Value and Payment	278.4%	238.8%	216.7%	126.86
Hedera	Settlement	Programmable	General Purpose Smart Contract Platforms	268.0%	240.8%	182.6%	188.61
Cardano	Settlement	Programmable	General Purpose Smart Contract Platforms	219.1%	215.6%	190.4%	129.30
Dogecoin	Settlement	Non-Programmable	Store Of Value And Payment	172.0%	323.1%	414.7%	122.53
Curve DAO Token	Sectors	Finance	Trading	169.9%	142.1%	22.4%	126.25
Polkadot	Settlement	Programmable	General Purpose Smart Contract Platforms	132.0%	115.0%	65.7%	119.82
Decentraland	Sectors	Culture	Vr And Ar	126.5%	142.3%	50.8%	150.31
Tezos	Settlement	Programmable	General Purpose Smart Contract Platforms	119.0%	106.0%	66.3%	180.29
EOS	Settlement	Programmable	General Purpose Smart Contract Platforms	115.1%	96.3%	38.8%	118.62
Synthetix	Sectors	Finance	Derivatives	108.0%	79.3%	-5.5%	141.19
Cosmos	Settlement	Programmable	General Purpose Smart Contract Platforms	101.1%	88.2%	-7.0%	114.05
Filecoin	Services	Utility	Information & Data Management	100.4%	97.9%	61.5%	94.54
Polygon	Services	Infrastructure	Scaling	90.6%	45.4%	-20.4%	115.15
Avalanche	Settlement	Programmable	General Purpose Smart Contract Platforms	79.4%	96.5%	109.6%	90.78
Ethereum Classic	Settlement	Programmable	General Purpose Smart Contract Platforms	77.7%	79.6%	77.0%	88.45
Uniswap	Sectors	Finance	Trading	72.3%	118.9%	119.8%	127.33
Chainlink	Services	Utility	Oracles	68.4%	74.4%	33.9%	89.36
Chiliz	Sectors	Culture	Social	63.3%	81.5%	34.2%	106.42
Fantom	Settlement	Programmable	General Purpose Smart Contract Platforms	63.2%	151.7%	253.0%	122.04
Internet Computer	Settlement	Programmable	General Purpose Smart Contract Platforms	58.5%	65.8%	172.8%	89.94
Apecoin	Sectors	Culture	Social	51.9%	149.9%	-3.9%	67.99
Litecoin	Settlement	Non-Programmable	Store Of Value And Payment	49.9%	58.7%	48.6%	95.29
Bitcoin Cash	Settlement	Non-Programmable	Store Of Value And Payment	49.3%	63.6%	138.5%	76.98
Aave	Sectors	Finance	Borrowing & Lending	48.0%	63.8%	115.8%	112.20
Ether	Settlement	Programmable	General Purpose Smart Contract Platforms	47.8%	48.5%	81.9%	64.31
Maker	Sectors	Finance	Stablecoin Issuance & Management	46.5%	6.1%	21.8%	94.06
Stacks	Services	Infrastructure	Computing	43.4%	55.3%	239.6%	97.19
Solana	Settlement	Programmable	General Purpose Smart Contract Platforms	41.1%	75.7%	301.2%	72.55
Bitcoin	Settlement	Non-Programmable	Store Of Value And Payment	38.5%	64.3%	156.5%	51.97

Leaders

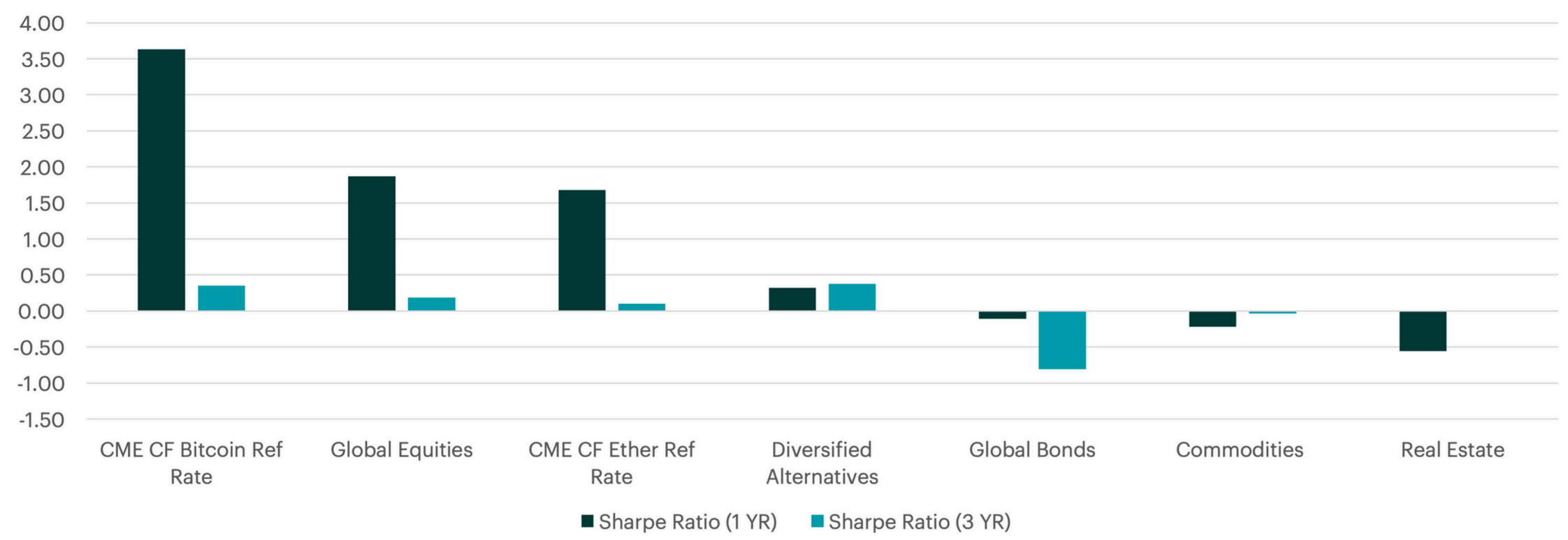
Stellar (XLM) led gains with +468.7% after Coinbase launched futures trading, boosting TVL and DEX volumes. Algorand (ALGO) followed at +288.9%, driven by surging transaction fees and stablecoin growth, with USDC market cap continuing to rise materially.

Laggards

Bitcoin (+38.5%) and Solana (+41.1%) underperformed this month despite their strong year-to-date gains, as investors shifted focus toward riskier, lower-capitalization cryptocurrencies.

Source: Returns are based in USD terms, CF Benchmarks, Bloomberg, as of November 30, 2024

Trailing Risk-Adjusted Returns



- When compared to traditional asset classes, both Bitcoin and Ether have delivered above average risk-adjusted performance over both shorter and longer time horizons.

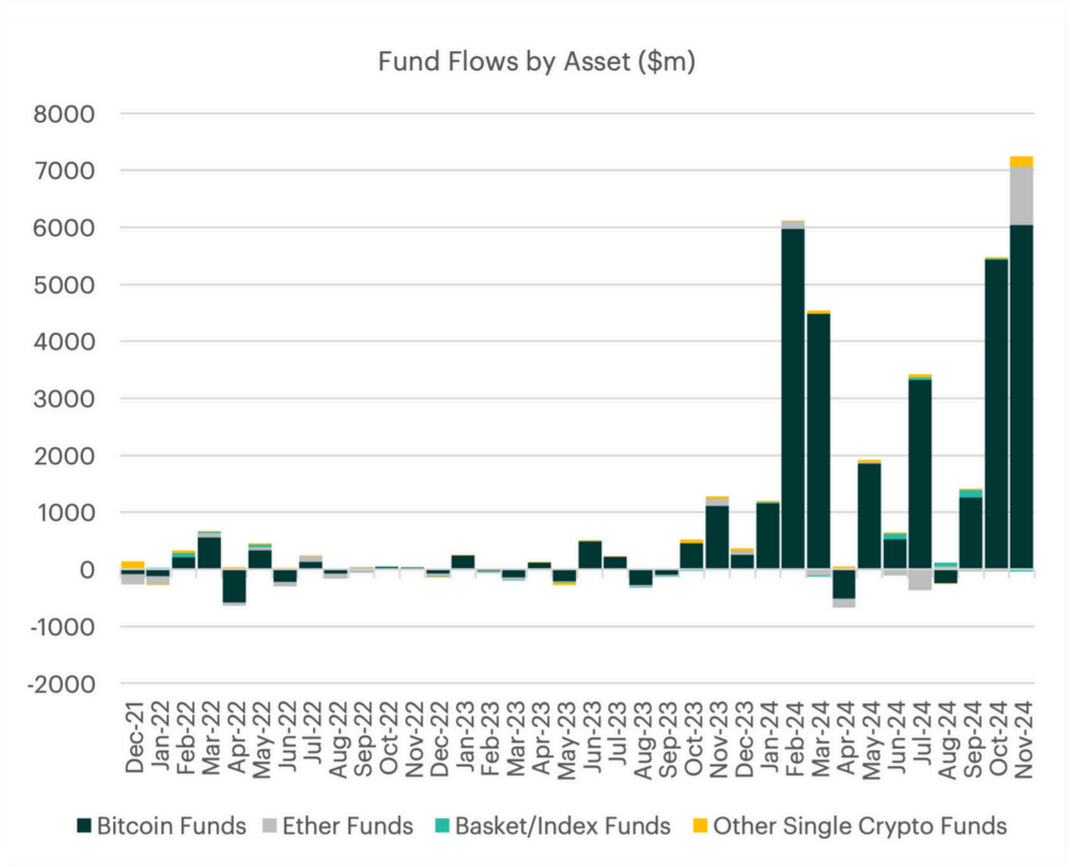
Source: CF Benchmarks, Bloomberg, total return indices are referenced in USD, as of November 30, 2024

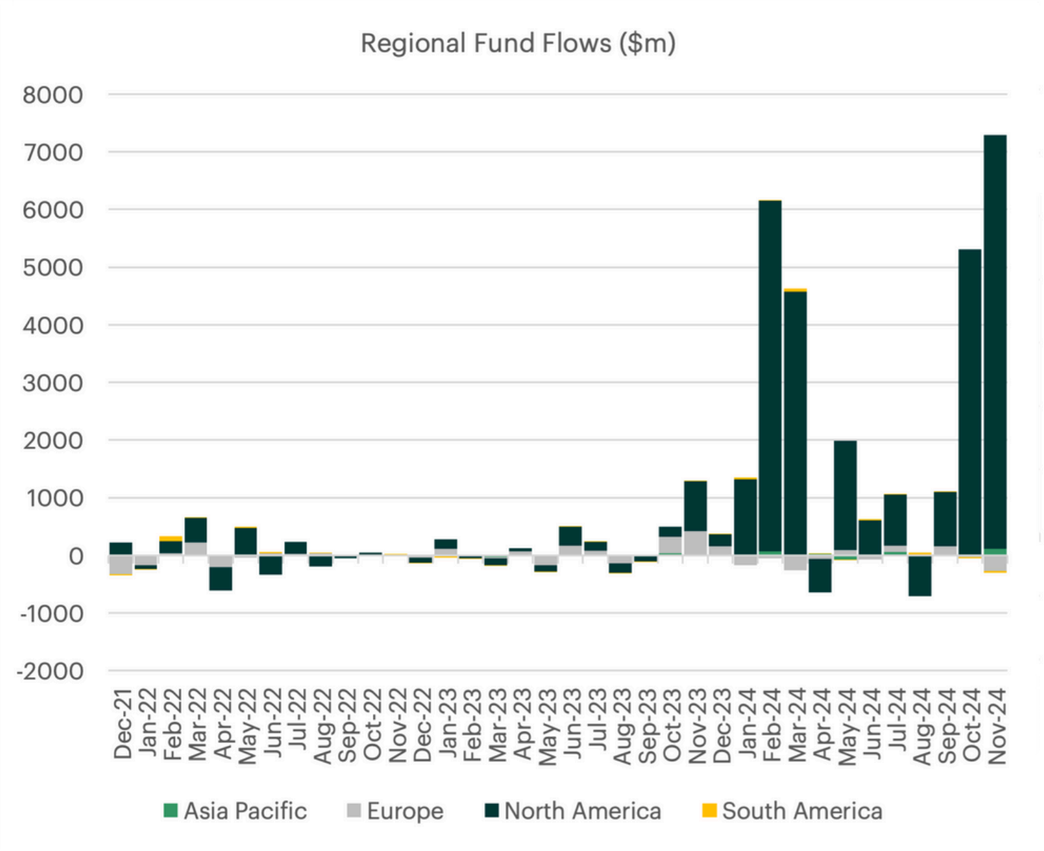
cfbenchmarks
a kraken company

Investor Activity & Sentiment Positioning

cfbenchmarks.com

Currency of Flows



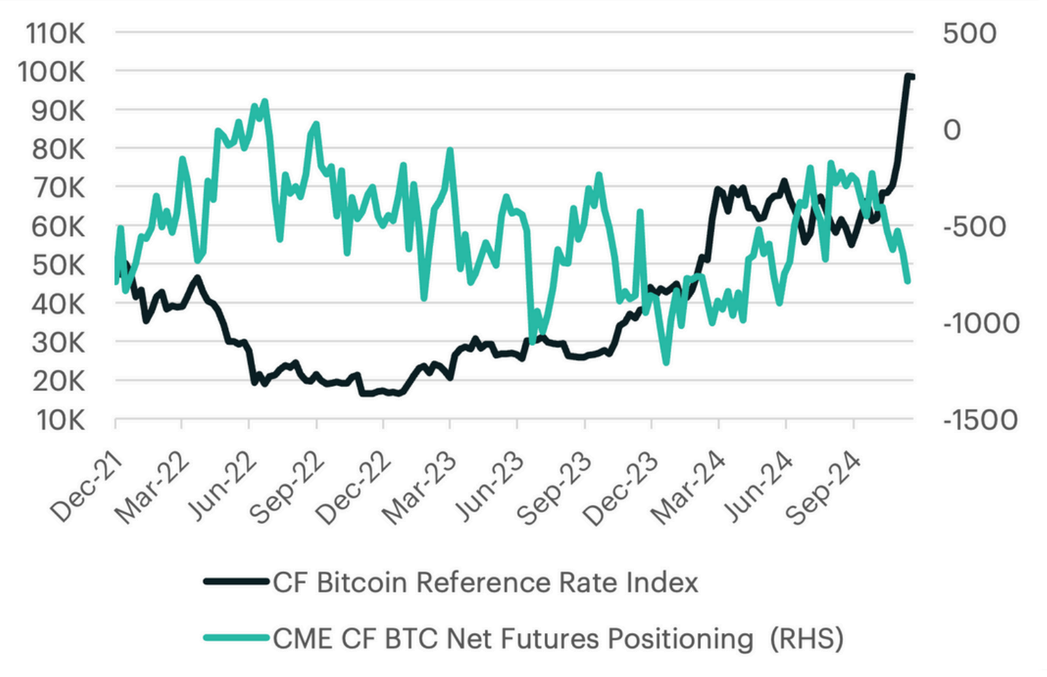


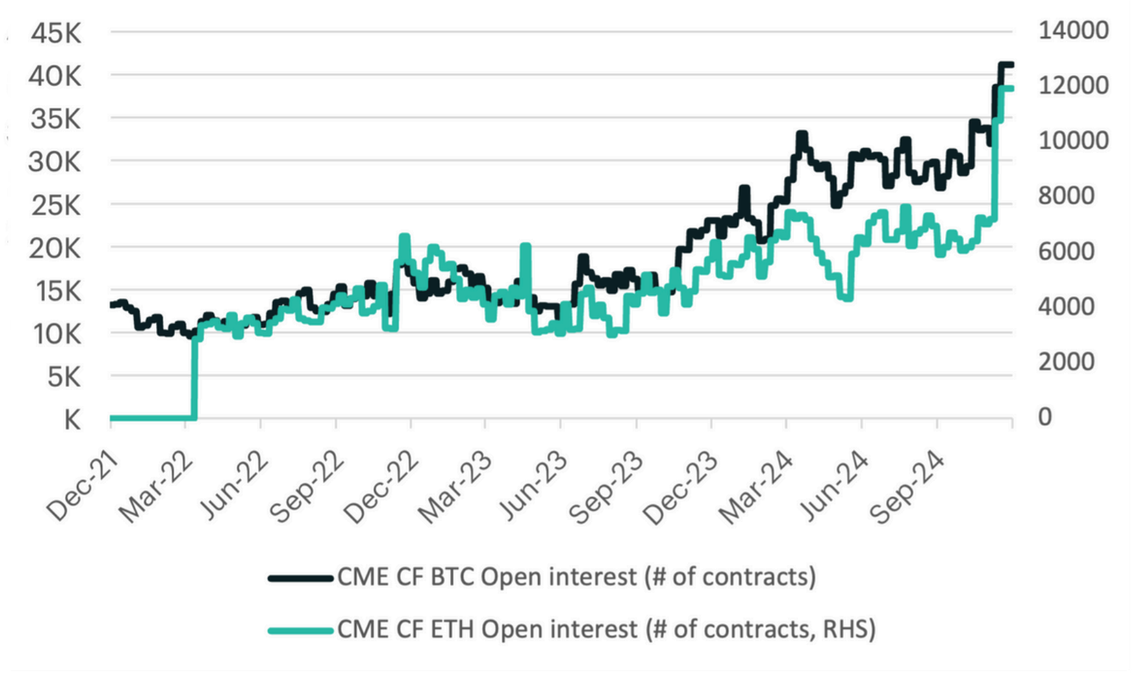
- Fund flows into digital assets broke January 2024's record level, with investors allocating over $7.2 billion. Ether witnessed record monthly fund flows, breaching the $1 billion level for the first time.

- From a regional perspective, fund inflows remained concentrated in North America ($7.2 billion), while the Asia Pacific region saw investor demand recover modestly ($115 million).

Source: CF Benchmarks, Bloomberg, as of November 30, 2024

Futures Positioning and Open Interest



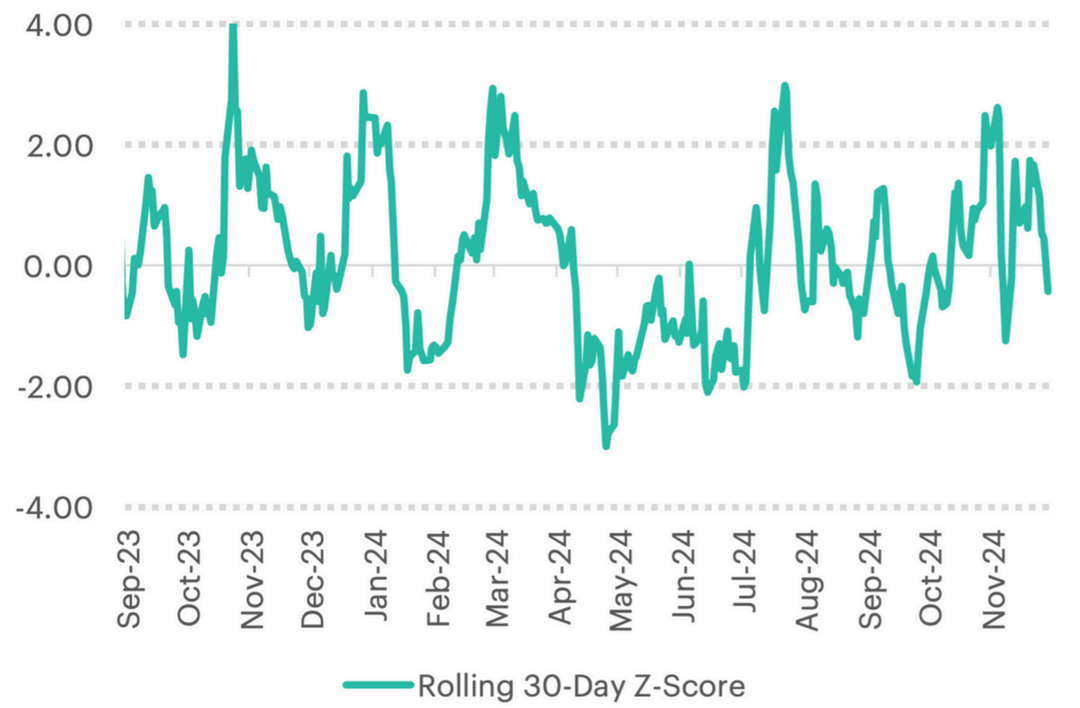


- Net sentiment positioning in Bitcoin increased in October, with short positions outpacing longs. This resulted in net futures positioning on the CME decreasing to -348 from -529 contracts.

- Total open interest for CME Ether futures grew at its fastest pace on record, rising almost 70% from the previous month and reaching new all-time highs. Bitcoin futures open interest also reached new highs, but with a more modest rise of 21.9%.

Source: CF Benchmarks, CFTC, Bloomberg, as of November 30, 2024

CF Bitcoin Volatility Index (BVX)



- The CF Bitcoin Volatility Index Settlement Rate (BVXS) is a once a day benchmark representing a forward looking, 30-day constant maturity measure of implied volatility based on CFTC regulated Bitcoin option contracts traded on the CME. The BVX represents the fair strike of a variance swap.

- Over the past month, the BVX ranged from a low of 53.52 to a high of 66.09. This period saw notable volatility contraction, with the index recording a -0.42 sigma move (measured by our rolling 30-day z-score) near month-end, following its monthly low on November 8th.

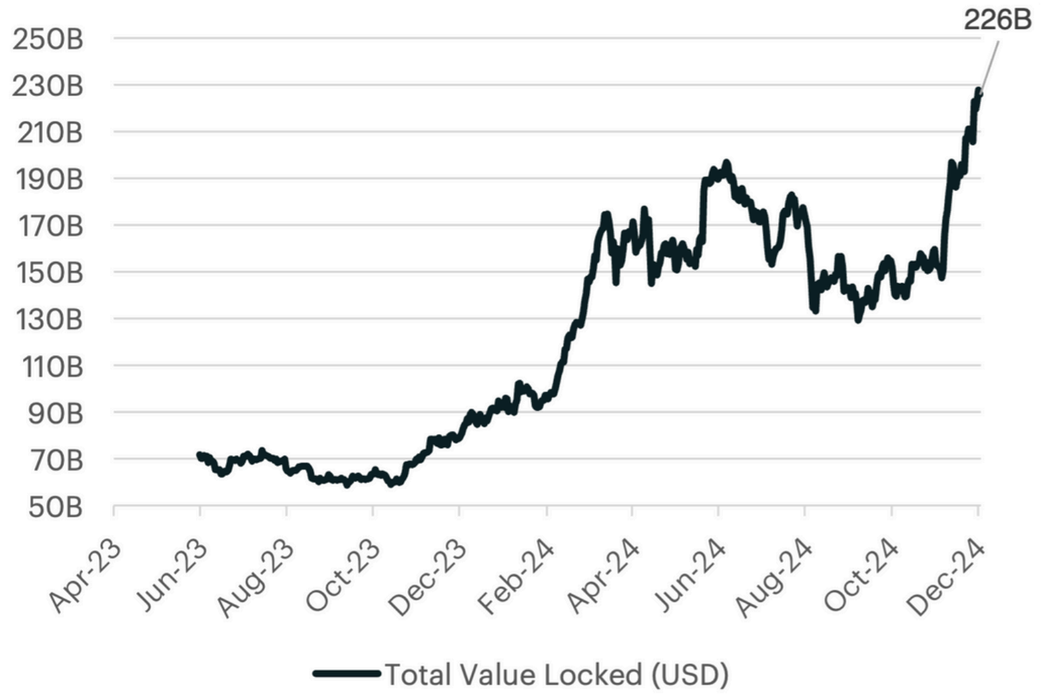
Source: CF Benchmarks, Bloomberg, as of November 30, 2024

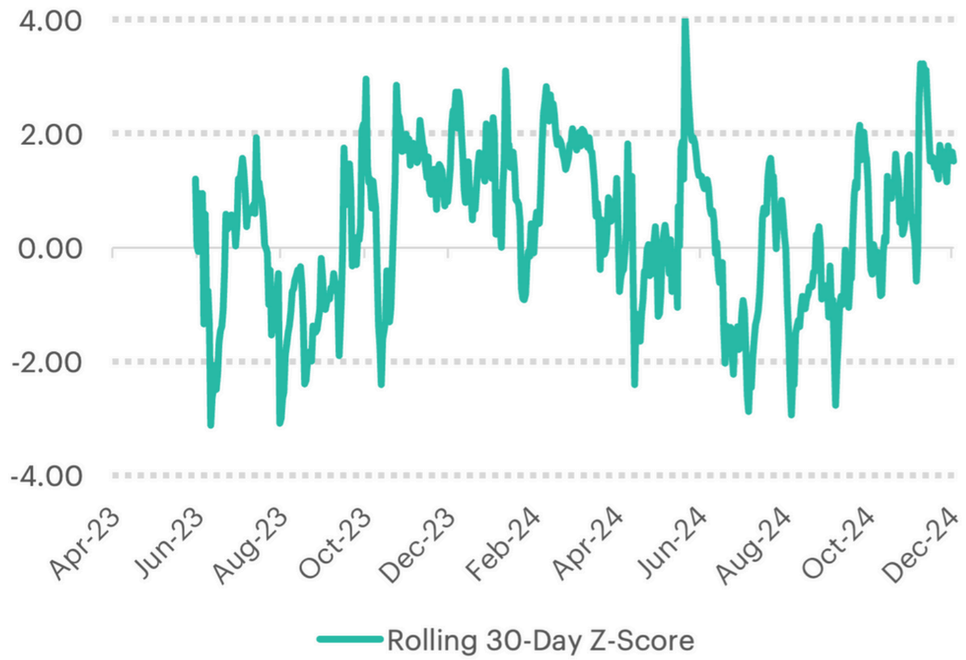
cfbenchmarks
a kraken company

Network Fundamentals & Reward Rates

cfbenchmarks.com

Total Value Locked (TVL) in DeFi Protocols



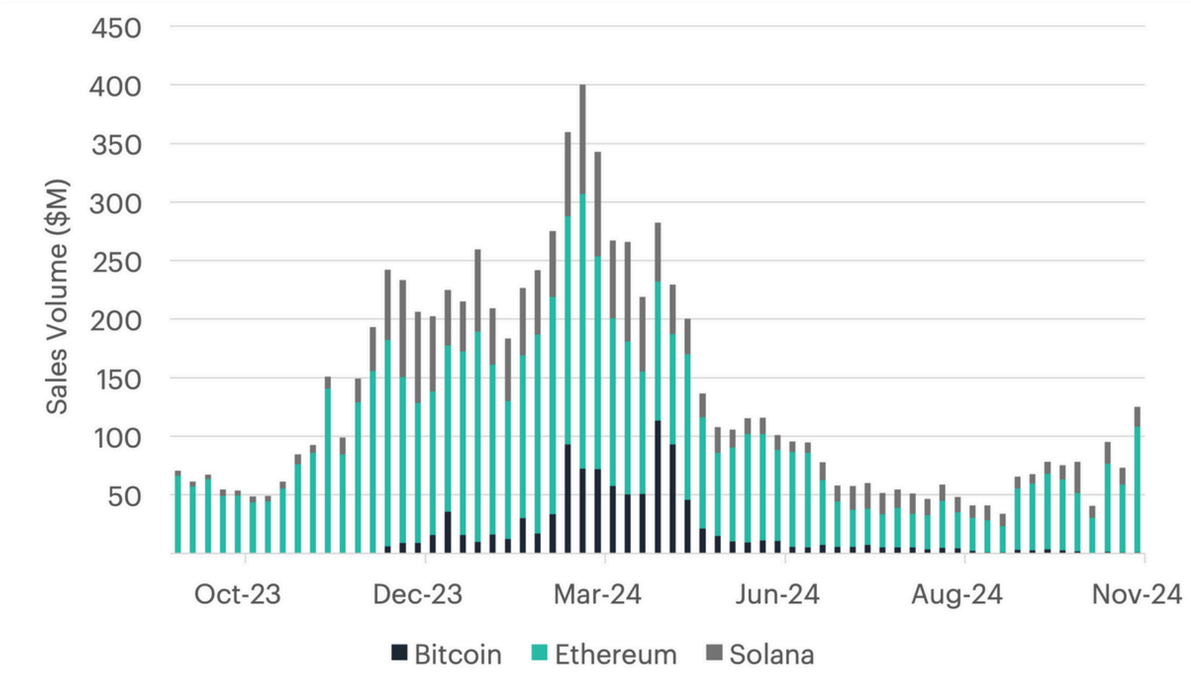


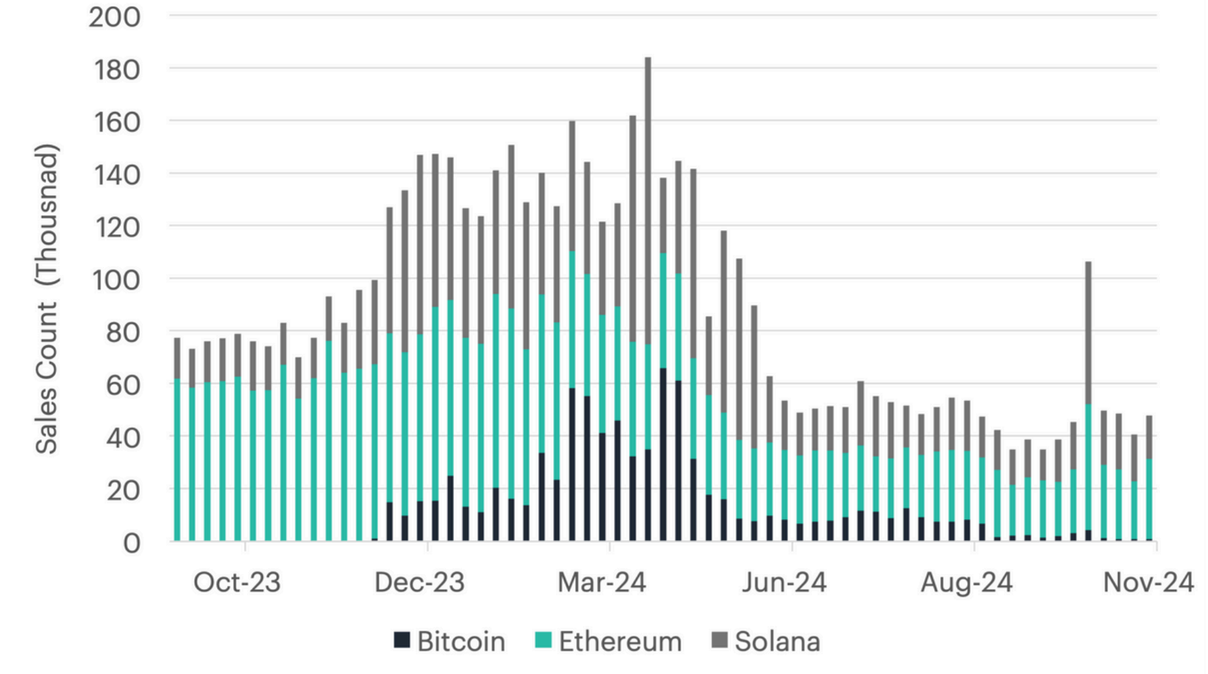
- TVL (Total Value Locked) in DeFi represents the total amount of assets deposited in decentralized finance protocols expressed in USD. It serves as a key metric to gauge the health and growth of the DeFi ecosystem.

- Total Value Locked (TVL) in decentralized finance (DeFi) protocols rose by 39.7% over the past month, reaching approximately $226 billion. This growth was driven by increased borrowing activity, decentralized exchange volume, liquid restaking deposits, and Ether's price appreciation.

Source: CF Benchmarks, DeFiLlama, as of November 30, 2024

Weekly NFT Sales by Blockchain





- Ethereum held the top position on the NFT sales volume leaderboard in November, with a 16.9% increase in sales even though transaction counts counts fell by 6.5%.

- Additionally, Bitcoin experienced a 68.9% decline in sales volumes as the number of transactions plummeted 68.4%. Solana's sales volume grew by 4.7%, despite a 24% decrease in transaction count.

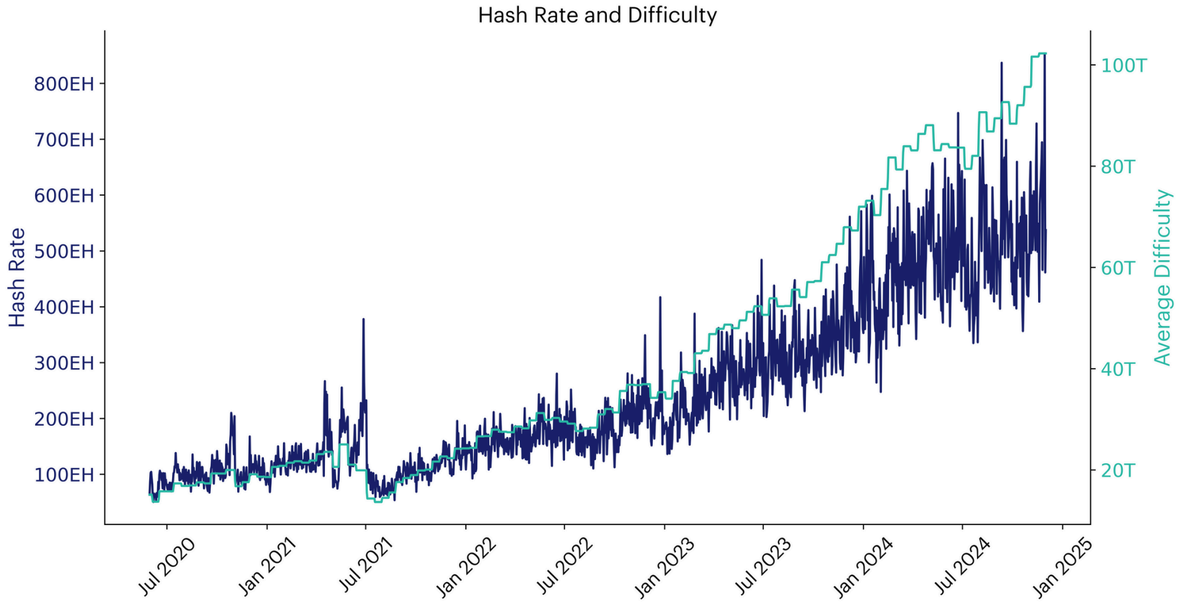
Source: CF Benchmarks, Dune Analytics, as of November 30, 2024

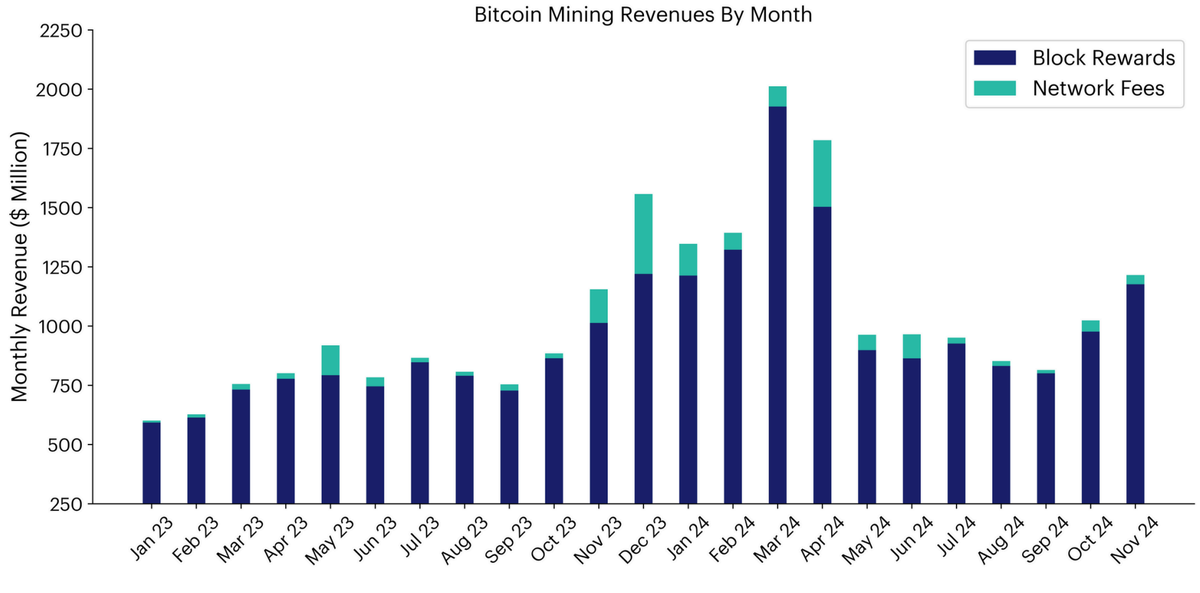
cfbenchmarks
a kraken company

Mining Metrics

cfbenchmarks.com

Bitcoin’s Hash Rate & Mining Revenue



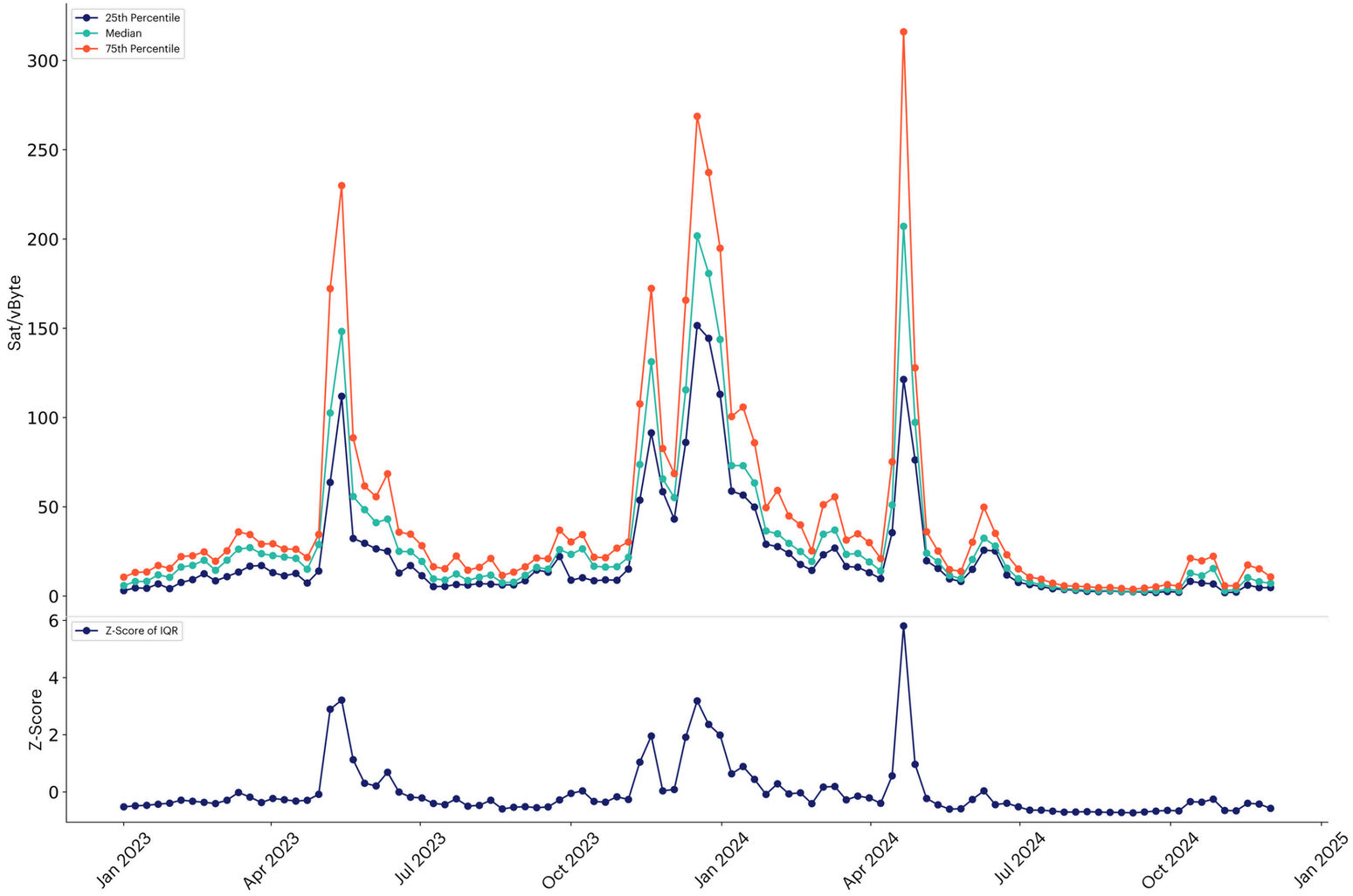


- Bitcoin's average monthly hash rate grew in November, gaining 19.1% to reach 579 exahashes per second. Mining difficulty, which measures the effort required to find a new block and adjusts to maintain a consistent block creation time, rose by 6.9% over the month. The next difficulty adjustment is expected in the second week of December.

- The increase in Bitcoin’s price resulted in an 18.7% growth in mining revenues in November. Of the miner rewards during the month, 3.1% came from fees, down from 4.6% in October. Despite a decline in on-chain activity, the price gains drove miners' earnings to their highest levels since the April halving.

Source: CF Benchmarks, Dune Analytics as of November 30, 2024

Bitcoin Network Fees



Source: CF Benchmarks, Dune Analytics, as of November 30, 2024

- As Bitcoin's block subsidy decreases, network fees make up a larger share of miners' revenue. The behavior of these fees, especially during periods of high demand for block space, can provide insights into the sustainability of fee increases.
- The data shows that during periods of high demand, the 75th percentile transaction fees surge significantly higher than the median and 25th percentile fees, indicating a subset of transactions paying much higher fees to ensure prompt inclusion in blocks.
- When the Z-score of the interquartile range exceeds 2, it signals substantial increases in the 75th percentile relative to the 25th percentile, highlighting times of significant network congestion and temporarily elevated fees.

Bitcoin Mining Matrix

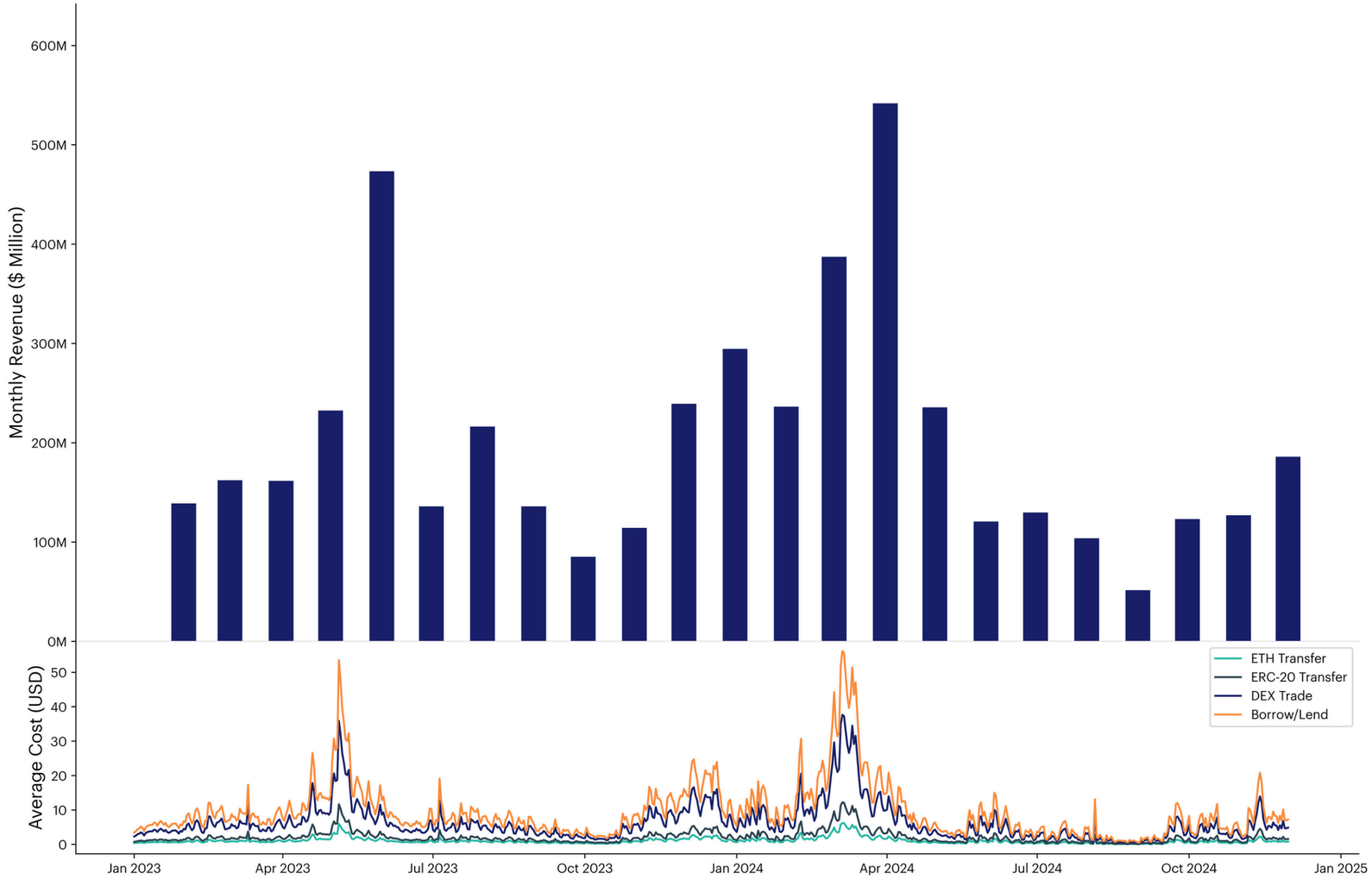
Efficiency (Watts /TH)	Bitcoin Price (USD)								
	$79,008.56	$83,166.91	$87,544.12	$92,151.70	$97,001.79	$101,851.88	$106,944.47	$112,291.70	$117,906.28
34.0	$60.62	$63.81	$67.17	$70.71	$74.43	$78.15	$82.06	$86.16	$90.47
29.5	$69.87	$73.55	$77.42	$81.49	$85.78	$90.07	$94.57	$99.30	$104.27
24.0	$85.88	$90.40	$95.16	$100.17	$105.44	$110.71	$116.25	$122.06	$128.16
21.5	$95.87	$100.91	$106.22	$111.81	$117.70	$123.58	$129.76	$136.25	$143.06
18.5	$111.41	$117.28	$123.45	$129.95	$136.79	$143.62	$150.81	$158.35	$166.26
17.5	$117.78	$123.98	$130.50	$137.37	$144.60	$151.83	$159.42	$167.39	$175.76
15.0	$137.41	$144.64	$152.25	$160.27	$168.70	$177.14	$185.99	$195.29	$205.06
13.5	$152.68	$160.71	$169.17	$178.07	$187.45	$196.82	$206.66	$216.99	$227.84

- The following sensitivity table illustrates the revenue a miner will generate per megawatt hour consumed at the current difficulty, considering different levels of miner efficiency and varying Bitcoin prices, providing a comprehensive view of potential earnings under different market conditions. The table is color-coded to reflect profitability based on the 10th percentile industrial electricity rate in the United States of $64.90 per MWh, as reported by the EIA in September 2024.
- This table helps miners compare revenues under various operational conditions, aiding in evaluating the useful life of their equipment. By comparing projected revenues at different Bitcoin prices to electricity costs, miners can determine whether they can continue running their current fleet or if they need to upgrade to maintain profitability.
- As income per MWh increases, miners are more likely to fund additional capital expenditures, which can increase the overall network hashrate. However, this increase in hashrate can subsequently reduce the income each individual miner earns.

Source: CF Benchmarks, Dune Analytics, as of November 30, 2024
EIA.gov as of September 30, 2024


cfbenchmarks
a kraken company
Network &
On-chain Updates
cfbenchmarks.com

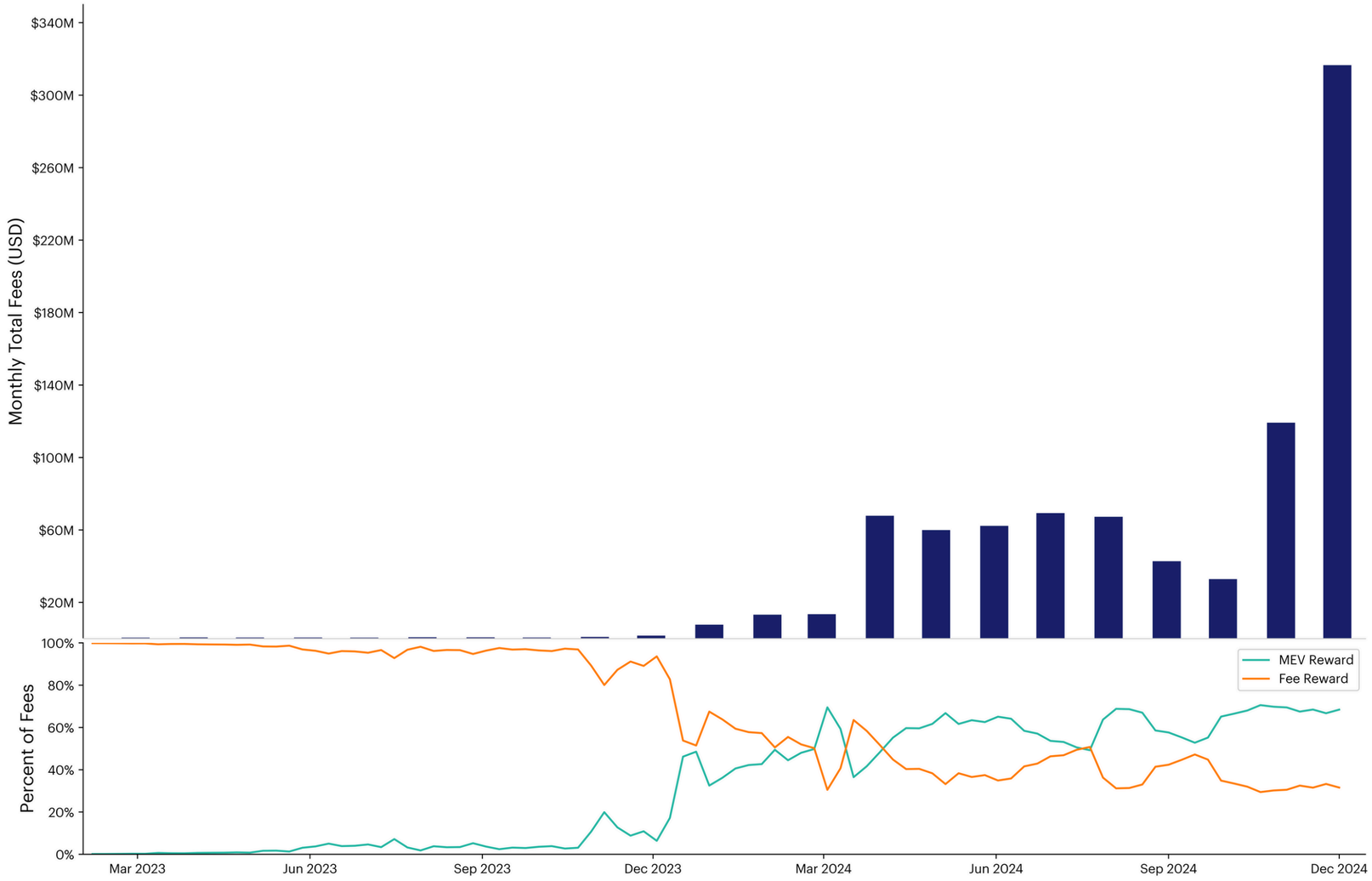
Ethereum Network Fees & Revenue



Source: CF Benchmarks, Dune Analytics as of November 30, 2024

- Ethereum’s block space is the capacity to include transactions in each block. When more transactions are posted to the blockchain than can be processed, fee rates increase as users compete to have their transactions included in the next block.
- By comparing average fee rates to total fee revenue, we can evaluate Ethereum's scalability. If fee rates remain low while total revenue remains stable or increases, it indicates effective scaling.
- In November, total fees paid on the Ethereum network rose by 46.3% from the previous month, reaching $185.9 million. While total fees grew significantly, the more modest 4.5% increase in average fees per interaction suggests that the network’s throughput is growing.

Solana Network Fees & Revenue



- Solana’s block space is the capacity to include transactions in each block. When more transactions are posted to the blockchain than can be processed, fee rates increase as users compete to have their transactions included in the next block.
- By analyzing the percentage of fees derived from MEV (Maximum Extractable Value) versus base fees, we can gauge the health of Solana's fee market. A higher proportion of MEV fees may indicate increasing competition and demand for block space.
- In November, total fees paid on the Solana network rose 166% from the previous month to $316.5 million. MEV accounted for approximately 67.9% of the total fees, reflecting strong demand for block space driven by competitive on-chain activities.

Source: CF Benchmarks, Dune Analytics as of November 30, 2024

Staking Rewards & Inflation Rates

Network	Staking Reward Rate	Inflation Rate	Participation Rate	Real Reward Rate
Ethereum	2.91%	0.22%	28.29%	2.69%
(1-Month Change)	*-0.24%*	*-0.19%*	*-0.18%*	*-0.05%*
Solana	6.51%	5.29%	65.72%	1.22%
(1-Month Change)	*0.73%*	*-0.12%*	*-3.67%*	*0.85%*
Cardano	2.67%	2.03%	62.49%	0.64%
(1-Month Change)	*-0.11%*	*-0.14%*	*0.51%*	*0.03%*

- The reward rate for a Proof of Stake (PoS) blockchain represents the annual return validators earn for staking their tokens, often expressed as a percentage. This rate is determined by factors such as the total number of staked tokens, the network's overall staking yield, and any additional incentives provided by the blockchain protocol.

- Inflation rate and staking participation rate significantly influence real staking rewards. A higher inflation rate typically increases the nominal reward rate but can dilute the value of staked tokens, resulting in lower real returns. The staking participation rate, which is the proportion of tokens being staked, also impacts rewards: as more tokens are staked, the rewards per validator may decrease, potentially lowering individual returns but contributing to network security and decentralization.

Source: CF Benchmarks, Dune Analytics, stakingrewards.com as of November 30, 2024

cfbenchmarks
a kraken company

Appendix

CF Digital Asset Classification Structure

CF Digital Asset Classification Structure

The CF Digital Asset Classification Structure (CF DACS) classifies coins and tokens based on the services that the associated software protocol delivers to end users, grouping assets by the role they play in delivering services to end users. The CF DACS powers CF Benchmarks' sector composite and category portfolio indices and allows users to perform attribution analysis to better understand the fundamental drivers of returns within their digital asset portfolios.

CF Digital Asset Classification Structure

Additional Resources

For more information about our CF Benchmark indices and our methodologies, please visit the respective web links below:

- CF Diversified Large Cap Index
- CF DeFi Composite Index
- CF Web 3.0 Smart Contract Platforms Index
- CF Digital Culture Composite Index
- CF Blockchain Infrastructure Index
- CF Cryptocurrency Ultra Cap 5 Index
- CF Broad Cap Index Market Cap Weight
- CF Broad Cap Index Diversified Weight

Contact us

Have a question or would like to chat? If so, please drop us a line to:

info@cfbenchmarks.com

Appendix

Disclaimer and Disclosures

CF Benchmarks Ltd (“CF Benchmarks”) is a limited company registered in England and Wales under registered number 11654816 with its registered office at 6th Floor One London Wall, London, United Kingdom, EC2Y 5EB.

CF Benchmarks is authorised and regulated by the Financial Conduct Authority (FCA) as a registered Benchmark Administrator (FRN 847100) under the UK Benchmarks Regulation.

CF Benchmarks is authorised to undertake the following regulated activity “Administering a Benchmark”. “Administering a Benchmark” is a regulated activity under article 63S of the Financial Services and Markets Act 2000 (Regulated Activities Order) 2001 (SI 2001/544) (RAO), which, in summary, means acting as the administrator of a benchmarks as defined in article 3.1(3) of the benchmark regulation.

CF Benchmarks is NOT a registered investment advisor and does NOT provide investment, tax, legal or accounting advice in any geographical locations. You should consult your own financial, tax, legal and accounting advisors or professional before engaging in any transaction or making an investment decision.

All information contained within is for educational and informational purposes ONLY. None of the Information constitutes an offer to sell (or a solicitation of an offer to buy) any cryptoassets, security, financial product or other investment vehicle or any trading strategy. No member of CF Benchmarks nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing contained herein or accessible through CF Benchmarks products, including statistical data and industry reports, should be taken as constituting financial or investment advice or a financial promotion.

Appendix

Disclaimer and Disclosures (cont.)

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results. The Information should not be relied on and is not a substitute for the skill, judgement and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

Charts and graphs are provided for illustrative purposes only. Index returns shown may not represent the results of the actual trading of investable assets/securities.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. However, backtested data may reflect the application of the index methodology with the benefit of hindsight, and the historic calculations of an index may change based on revisions to the underlying economic data used in the calculation of the index.

All information and data contained in this publication is obtained by CF Benchmarks, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, such information and data is provided "as is" without warranty of any kind.

No member of CF Benchmarks nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or of results to be obtained from the use of any CF Benchmarks products.

Appendix

Disclaimer and Disclosures (cont.)

No responsibility or liability can be accepted by any member of CF Benchmarks nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any error (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of CF Benchmarks is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. CF BENCHMARKS DOES NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IT EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

CF Benchmarks is a member of the Crypto Research group of companies which is in turn a member of the Payward group of companies. Payward Inc. is the owner and operator of the Kraken Exchange, a venue that facilitates the trading of cryptocurrencies. The Kraken Exchange is a source of input data for CF Benchmark Indices.