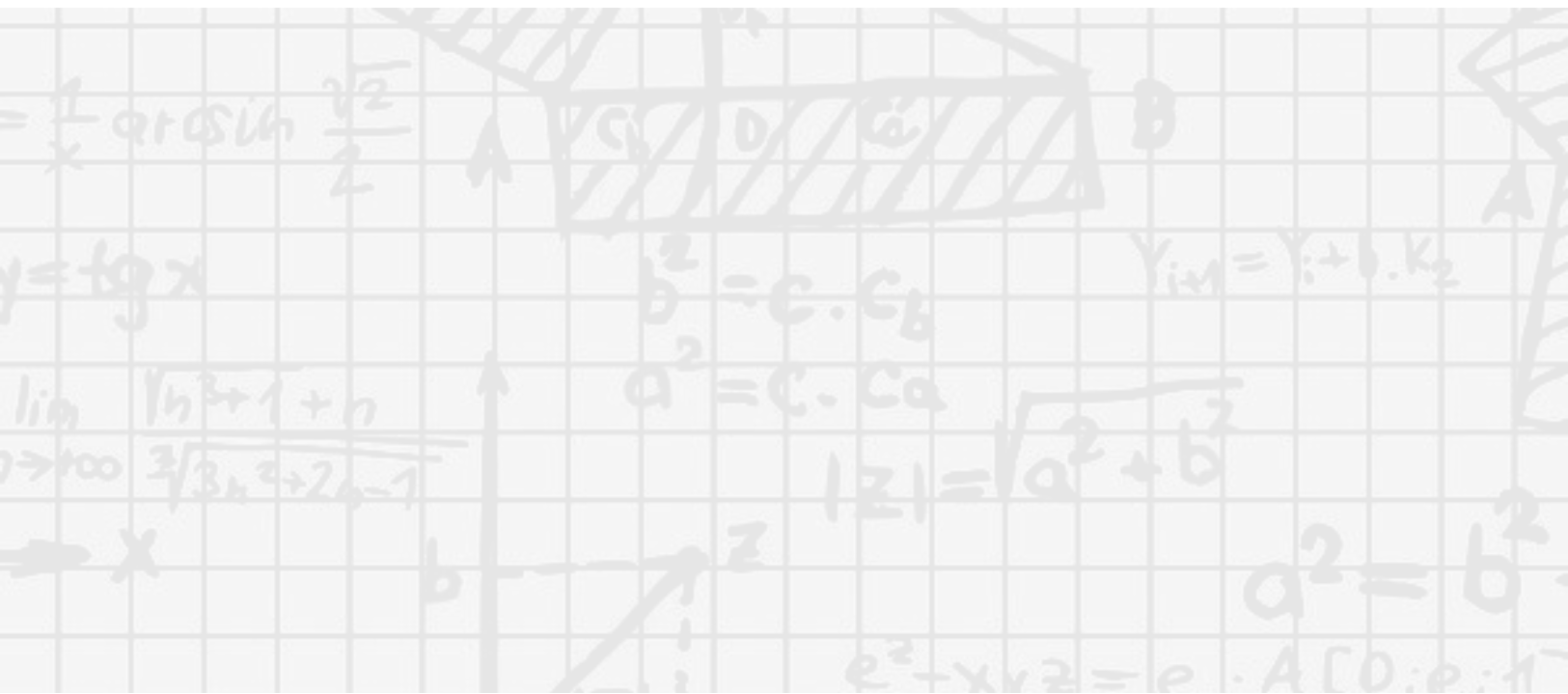


Digital Asset Markets Report

1H September 2022



The S2F Intelligence report examines network fundamentals using on-chain analysis, technical tools, and proprietary indicators. We aim to provide insight into how digital assets perform during these unprecedented times. By recognizing trends in both momentum and volatility, we seek to identify opportunities while navigating uncertain market conditions.



Macro Overview

- S&P 500 and DJIA indices continue declining this month, posting -19.2% and -14.6% YTD, with the NASDAQ underperforming to the downside at -28.2% on the year. Markets reacted negatively to August CPI data of 8.3% - the headline figure exceeded analysts' expectations of 8.1%. Core CPI also increased in August, rising from 5.9% in July to 6.3%, which could impact Fed policy this week.
- While headline CPI data has declined from its 40-year high of 9.1% in June, markets are still estimating an 83% likelihood of an additional 75 bps with a 17% chance of a 100 bps hike at the September FOMC meeting.
- The yield curve between the US10Y and US2Y has remained inverted since July, with 10-year treasuries reaching their highest levels since 2007. Rising yields continue to fuel global demand for the dollar, which recently propelled the DXY index to a yearly high of 110.78.
- G7 members discuss implementing a price cap on Russian oil as EU countries prioritize restocking their natural gas reserves for winter.
- According to data from Freddie Mac, the average 30-year fixed mortgage rate reached 5.66% -- one year ago, rates were 2.88%.



Macro Performance

Page 1

- Russian natural gas exports to Europe decline to nearly 40 year lows.
- Germany's Chancellor Scholz announces a \$65 billion inflation relief package.
- EU expects to raise €140bn from windfall tax on energy firms citing "abnormally high profits."
- US weighs purchasing oil near \$80 to refill the depleted Strategic Petroleum Reserves (SPR) - oil is trading at \$85.65/barrel.
- The Euro continues to trade at parity with the US dollar.
- Gold remains in negative territory -7.89% YTD.
- Commodities continue to maintain upside and outperform traditional indices - GSCI commodity index +26.3% in 2022.



On-Chain Analysis

Page 2

- **Bitcoin Market Realized Gradient:** This indicator helps identify momentum between speculative value and actual organic capital inflows on a 14d, 28d, and 140d timeframe. The low timeframe failed to maintain support in positive territory, while the high timeframe trend remains in negative territory.
- **Ethereum Realized Gradient:** While the low timeframe 14d recently reclaimed positive territory, it failed to maintain support in the region as both the medium timeframe 28d and 140d high timeframe accelerate to the downside.



Technical Levels

Page 3

- **Bitcoin:** Continues to trade below its 50d MA after the most recent August CPI data report - while the 2017 cycle ATH remains a crucial level of support, downside pressure remains along with all risk-on assets.
- **Ethereum:** Price broke below the 50d MA after the merge on September 15th - large volumes of sell-side pressure remain at the \$1,500-2,000 level. The next major test of strength and momentum remains at the 200d MA.



Momentum & Sentiment

Pages 4-5

- **pMV momentum model:** Currently remains sidelined in cash.
- **Alt-season indicator:** Our indicator suggests weakness in alts has increased while the indicator shows the trend strengthening for Bitcoin.
- **Delta risk:** Since reaching the indicator's higher risk-off level for both BTC and ETH - the delta risk has started to gradually decrease.



Money Flows & Themes

Pages 6-7

- **Ethereum Protocol Security:** If more network participants choose to stake, the protocol will be required to issue more ETH to validators in exchange for providing security - this has a positive impact on the network security budget.
- **ETH 2.0 Network Dynamics + Application Landscape:** As the economic utility of the token grows, so does user adoption and the velocity of economic activity. Application layers generate utility for users - from decentralized lending/borrowing protocols, exchange platforms, and even the next potential wave of web3 domain ownership.

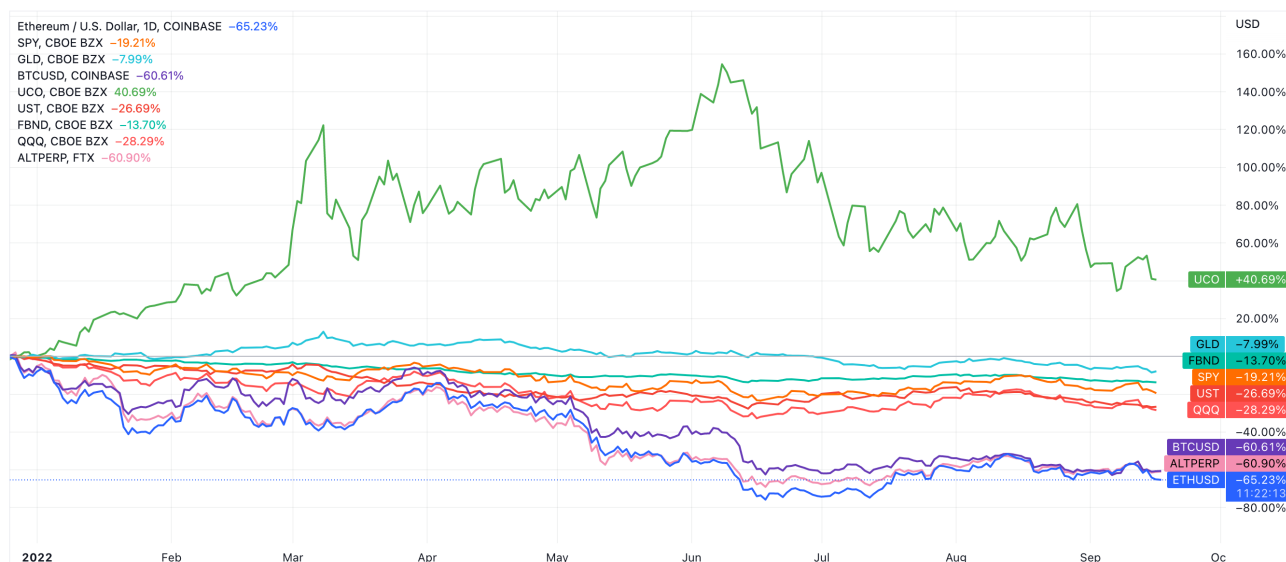


Notable News

Page 8

- Bitcoin, Ethereum, Layer One, and Other Headlines.

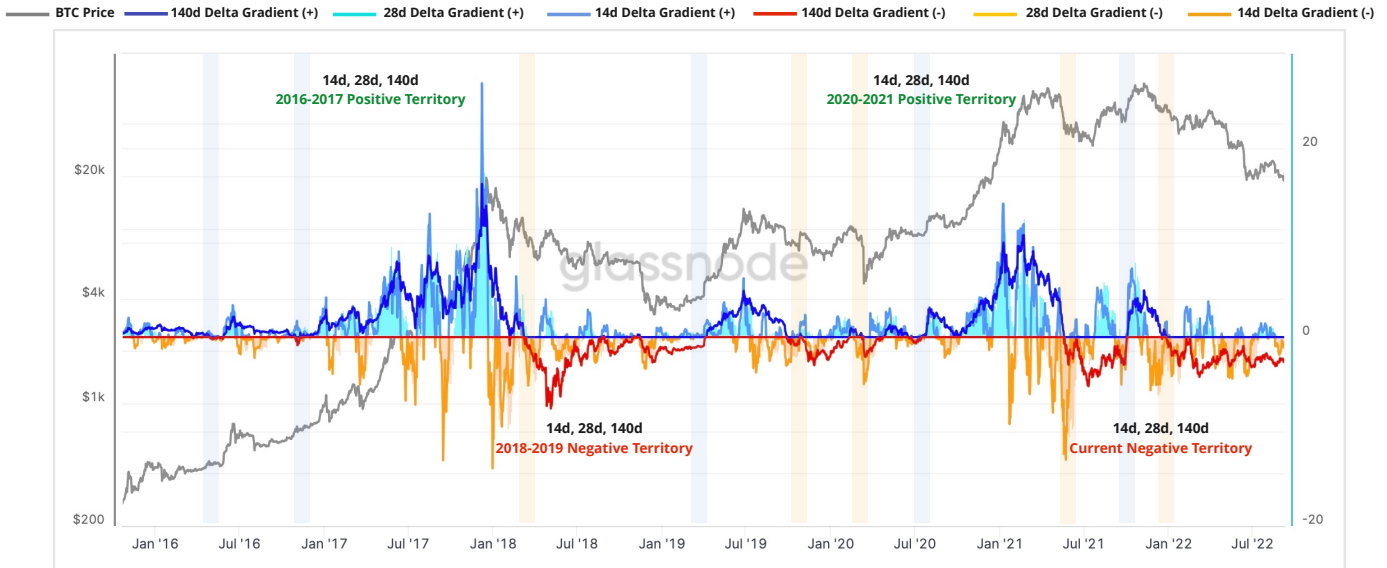
2022 Asset Returns



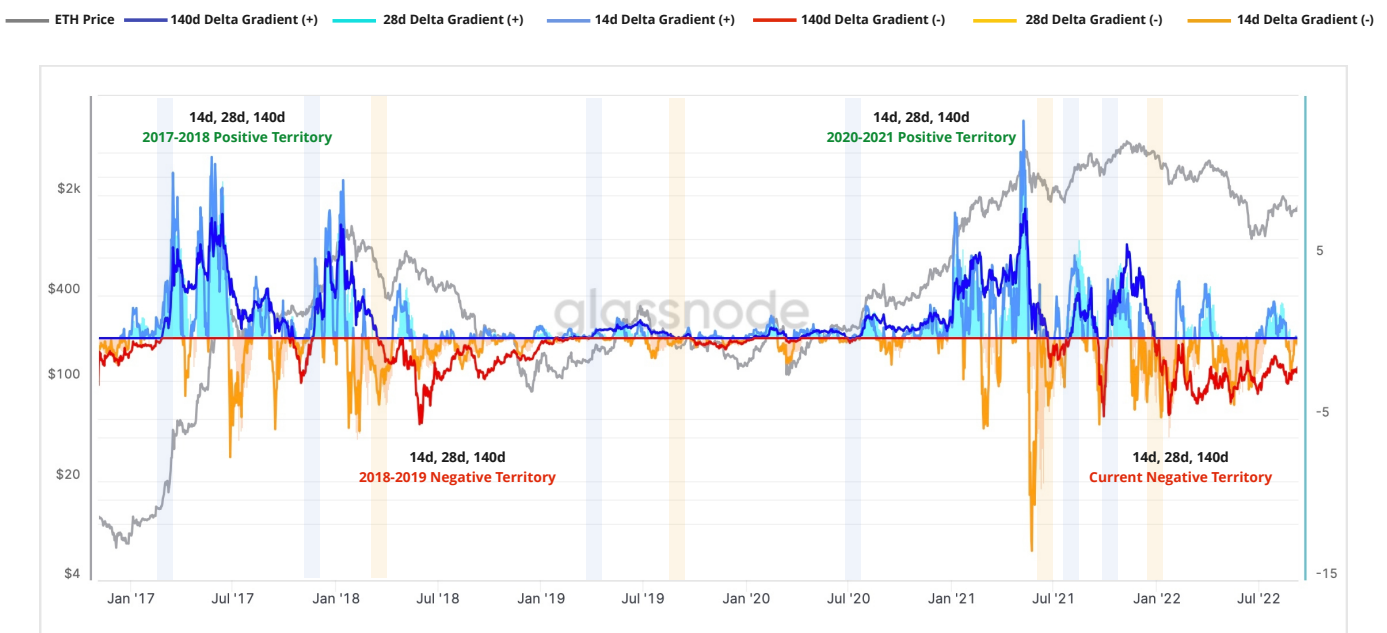
Asset	MtD*	QtD	YtD	Volatility (annualized)*	Sharpe (annualized)*	Correlation (to Bitcoin)**
Bitcoin	-2.0%	2.0%	-60.61%	68%	-1.53	1.0
Ethereum	-7.1%	38.6%	-65.23%	90%	-0.96	0.66
Altcoin Index	-2.8%	18.9%	-60.90%	79%	-1.15	0.74
SPY	-1.6%	2.3%	-19.21%	24%	-1.11	0.67
QQQ	-1.0%	2.8%	-28.29%	31%	-1.11	0.78
GLD	-1.8%	-7.9%	-7.99%	14%	-0.79	0.19
UCO	-4.2%	-28.4%	40.69%	82%	0.95	-0.06
FBND	-0.8%	-1.7%	-13.70%	7%	-2.54	0.79
UST	-3.0%	-8.8%	-26.69%	19%	-2.22	0.67

Sources: Glassnode, AlphaVantage
 Assets: SPY = S&P500, QQQ = NASDAQ, GLD = Gold, UCO = Crude Oil, FBND = Total Bond Market, UST = 7-10 YR Treasury, Alt-Perp (FTX) = Altcoin Index
 *as of September 15th, 2022
 **last 90 days

Bitcoin Market Realized Gradient (14d, 28d, 140d)



Ethereum Market Realized Gradient (14d, 28d, 140d)



- Market Realized Gradient models momentum relative to capital flows by calculating the difference between the gradient of spot price (ETH or BTC) and the realized price gradient (*average aggregate price paid for tokens*). The indicator can help identify momentum between **speculative value** and **actual organic capital inflows** on a 14d, 28d, and 140d timeframe.
- When **Delta Gradient is in positive territory (dark blue - light blue)**, it indicates an expected uptrend is in play and can be expected to continue for a similar length of time to the period of the oscillator (14d, 28d, 140d). When **Delta Gradient is in negative territory (red - light orange)**, it signals a downtrend is in play with a similar expected duration (14d, 28d, 140d)
- **Increasing successive peaks in the Delta Gradient** indicates greater verticality and suggests **momentum continuation** to the upside. **Decreasing successive peaks in the Delta Gradient**, particularly when the price is making higher highs, indicates **declining momentum** with each rally which can signal a potential trend reversal.
- When the **140d** (High Timeframe) or **14d** (Low Timeframe) cross above or below the 0.00 level: **blue converts to red/orange (negative)** or **red/orange to blue (positive)**.

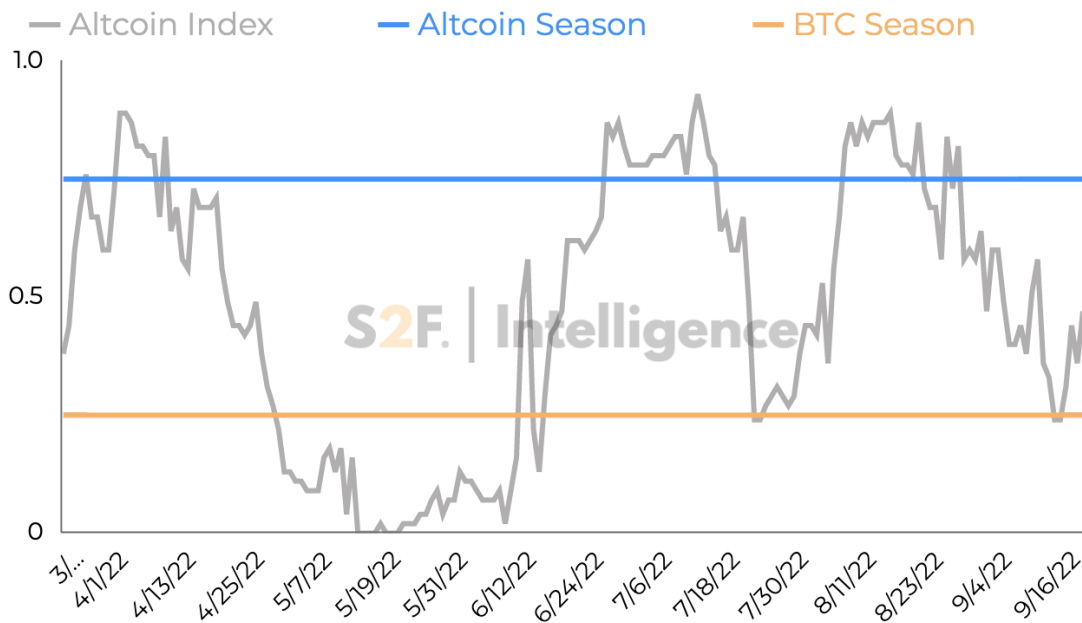
- **Bitcoin continues to trade below its 50d MA (blue)** after disappointing August CPI data was reported on Tuesday.
- Support continues to hold at the 2017 cycle ATH on high timeframes but remains under pressure along with all risk-on assets.
- Previous levels of support have become resistance (\$22.6K - \$24K), and we continue to remain cautious of false momentum until critical levels of price structure are reclaimed.



- **The Ethereum price broke below the 50d MA (blue) level of support since the merge happened on Friday, September 15th.**
- Large volumes of sell-side pressure remain at the \$1,500-2,000 level. The next major test of strength and momentum will be the **200d MA (gold)**. Until the price can establish support back above \$2k, we remain pessimistic about higher levels in the short term.

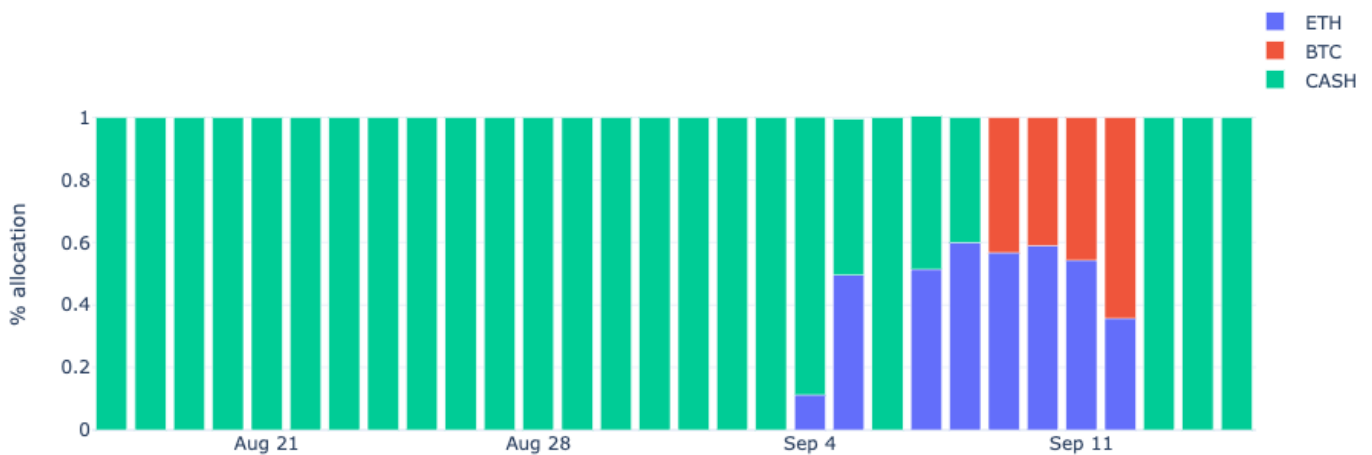


S2F Alt-Season Indicator



The S2F Alt-Season Indicator is a proprietary model that measures the capital flows between Bitcoin and a basket of major Altcoins. This indicator is especially helpful in **identifying where strength resides** in the cycle and can **potentially indicate what may happen next**. When the Index line (gray) is below the orange line, it generally signals strong momentum favoring Bitcoin vs. Altcoins.

S2F Momentum Model (pMV)

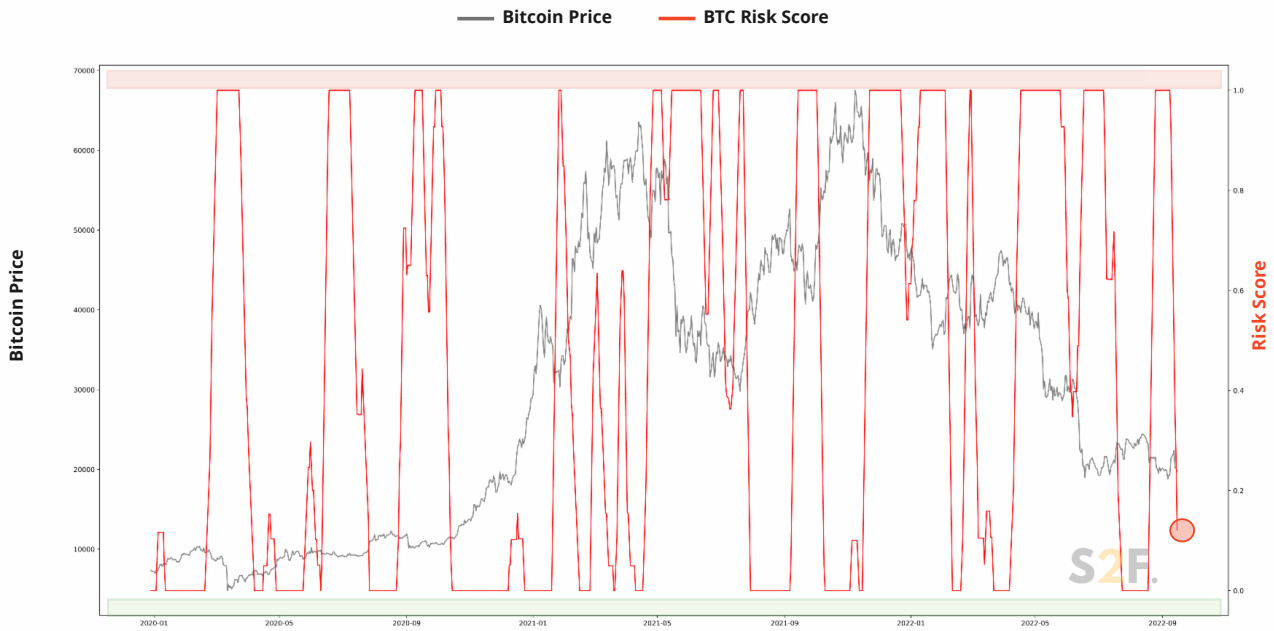


The S2F Momentum Model is a proprietary model that **compares the price momentum of BTC vs. ETH vs. USD** over a rolling window to suggest an optimal allocation of capital to each of these three assets. The entry and exit signals rely on two momentum indicators, one slow and one fast, to help determine portfolio over-or underweight-ness in each of the three assets. The chart above shows the suggested daily allocation over the last 30 days.

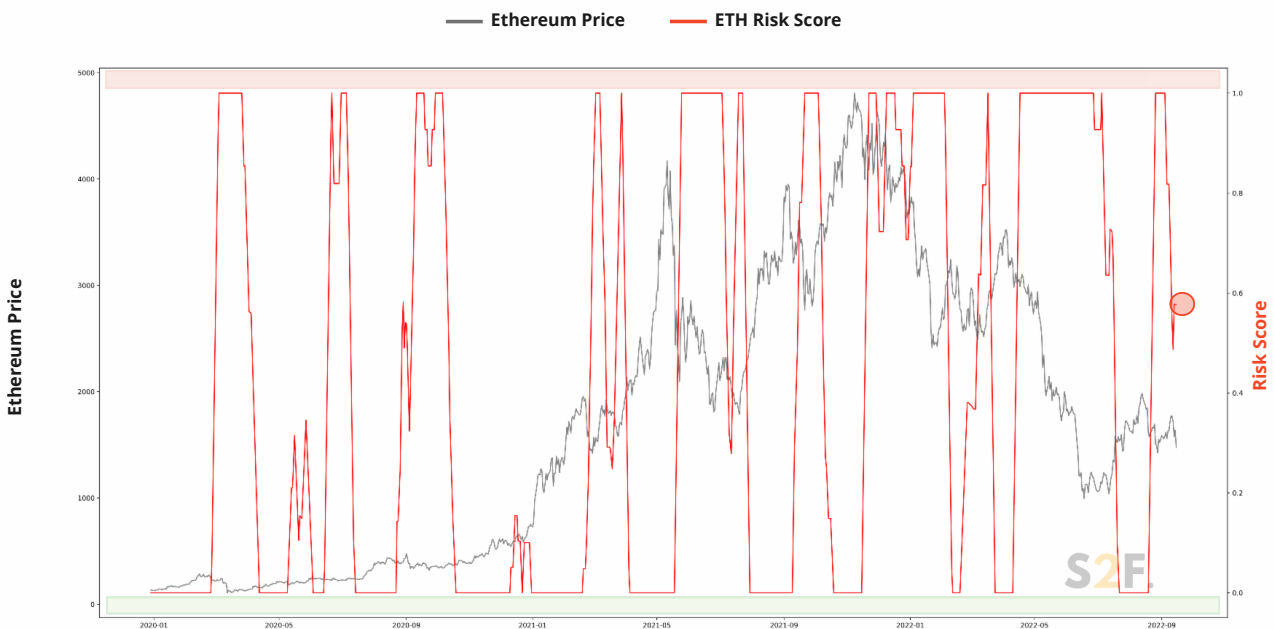
Delta Risk Score

The Delta Risk Score is a proprietary model that **measures the probability of an imminent retracement in price**. The indicator's value (**red line**) oscillates between 0 and 1, with the former signaling low-risk while the latter determines high-risk conditions. The chart below shows both indicators and the underlying asset's price (**grey line**) since Q1 2020.

Bitcoin



Ethereum



Post-Merge Protocol Impacts

The previous PoW Ethereum token issuance rate was 3.98% which resulted in \$20.7 million (in today's prices) in potential daily token sell-pressure from miners. Post-merge, the issuance rate of new token supply could be close to 0.00% for the next year.

- The protocol now exclusively issues block rewards + tx fees to validators, but stakers will not gain access to these rewards until the Shanghai upgrade - which is estimated to occur within next year.¹
- In contrast, the Bitcoin price faces ~\$18 million (at today's current prices) in potential daily sell pressure from PoW miners with energy and machinery input costs.²
- Modeling based on median return for validators from (March 2022- August 2022) estimates current staking APR: 6.1%.³
- Updated ETH 2.0 Staking Contract Balance: 13.77 million ETH (11.4%) and ETH Exchange Balance: 22.61 million ETH (18.9%)
- The transition from PoW to PoS decreased global energy consumption by 0.2%. Ethereum PoS is on track to use < 4% of PayPal's annual energy use.⁴

PoW Token Issuance Rate

Name	Issuance Rate	▼ Daily issuance
Ethereum	3.98%	\$20,697,656.63 ^
<small>Issuance Model</small> ETH is issued to miners and validators.		
<small>Website</small> ethereum.org		
Bitcoin	1.74%	\$17,977,412.29 v
Dogecoin	3.63%	\$835,367.37 v
Cardano	1.47%	\$638,950.61 v
Litecoin	3.81%	\$435,130.57 v

Network Security Budget + Token Issuance

- Post-merge, the annual issuance of ETH tokens will coincide with the total amount of ETH staked to the network.
- As more participants potentially choose to stake, the protocol will be required to issue more ETH to validators in exchange for providing security - this impacts the network security budget.
- Example: if the market cap of ETH reached \$1 Trillion (\$8,000/ETH) while 10 million ETH were staked - the protocol would be required to issue 572,000 ETH (\$5B) annually.
- If 30 million ETH were staked, the protocol would issue 991,000 ETH (\$8B) annually. If market cap grew from \$1 Trillion to \$5 Trillion over time, the Ethereum security budget would also increase by 5x - as price appreciates, so does network security!

ETH Security Issuance Token Rewards (%)

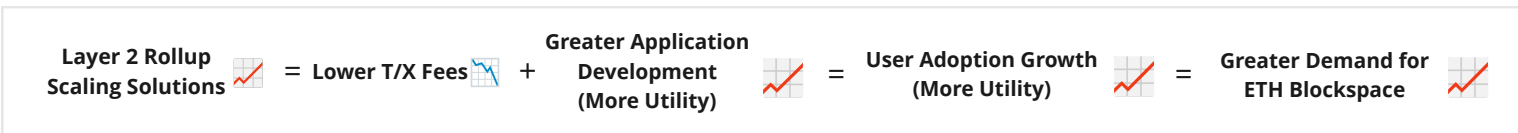
Total ETH Validating	Max Annual Issuance (ETH)	Max Annual Network Issuance (%)	Max Annual Validator Return Rate
1,000,000	181,019	0.17%	18.10%
3,000,000	313,534	0.30%	10.45%
10,000,000	572,433	0.54%	5.72%
30,000,000	991,483	0.94%	3.30%
100,000,000	1,810,193	1.71%	1.81%

Greater Network Security Impact

- Greater network security further incentivizes sidelined developers to join the ETH network, leading to more innovative applications for users.



- L2 rollup scaling will continue to improve t/x fees and network scaling to accommodate onboarding these new users seeking application utility.



- As global adoption of the network grows, so will the demand for ETH network blockspace - the greater the demand for blockspace, the higher the potential basefee to transact on ETH. The greater the basefee, the higher the EIP 1559 burn = greater token appreciation to token holders.

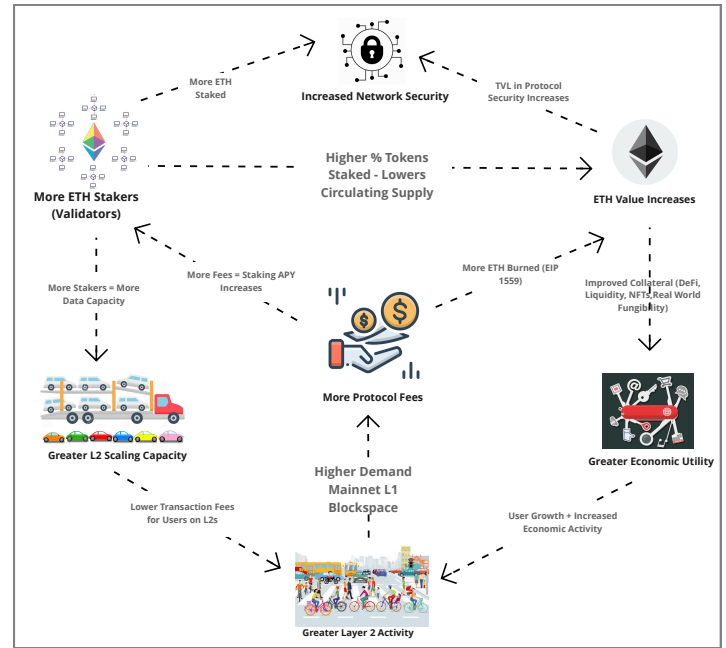
1 Decrypt - The Ethereum Merge Is Here—What Comes Next? <https://decrypt.co/109766/the-ethereum-merge-is-here-what-next>
 2 Money Printer, How much money are protocols paying to grow? <https://moneyprinter.info>
 3 Pintail's Notes, Post-Merge MEV: Modelling Validator Returns <https://pintail.xyz/posts/post-merge-mev/>
 4 Ethereum.org, Ethereum Energy Consumption <https://ethereum.org/en/energy-consumption/>

Money Flows & Themes

Ethereum 2.0 Network Dynamic

Leading up to Ethereum's merge, our intelligence reports have aimed to build a foundation in network fundamentals.

- The network dynamics of Ethereum are driven by users' demand for secure block space. Greater demand generates more protocol fees, increasing staking APY and incentivizing more stake users.
- As validator participation grows, more ETH is staked, increasing security and higher data capacity for the network.
- The higher % of tokens staked lowers the circulating supply, which strengthens ETH's value - improving it as collateral. In addition, layer two scaling ensures new users have access to lower network fees.
- As the economic utility of the token grows, so does user adoption and the velocity of economic activity.

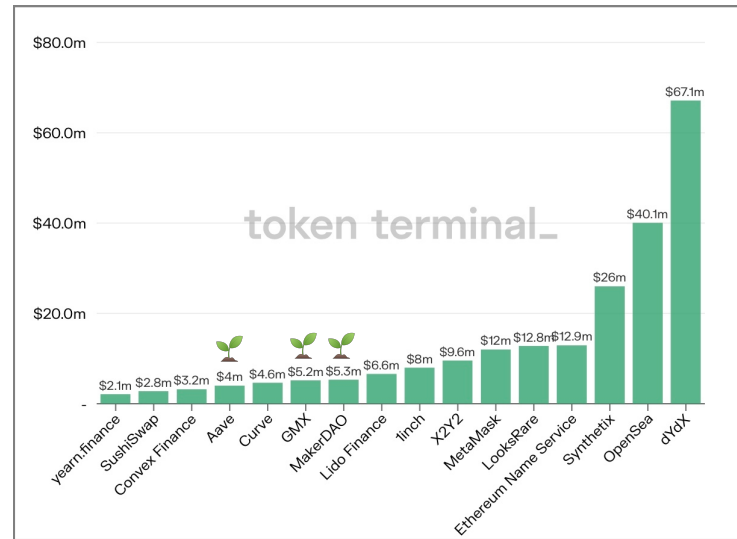


Ethereum's Application Landscape

The Ethereum ecosystem has fostered innovative application growth, creating utility for users, which continues to drive adoption. From decentralized lending/borrowing protocols, exchange platforms, and even the next potential wave of Web3 domain ownership.

- Lending protocols like AAVE and MKR allow users to earn interest, borrow assets, and build applications using existing tokens. AAVE currently has ~\$10.2B of liquidity locked in its decentralized liquidity protocol, and MKR has \$7.5B.¹
- Popular decentralized exchanges like Uniswap allow users to swap and provide liquidity on the trading application. Uniswap has recorded more than 109 million trades and has facilitated more than \$1.1 Trillion in trade volume.
- GMX is an exchange offering users access to market-making and leverage trading. There are ~88,000 GMX users who trade on ETH's L2 Arbitrum. The decentralized perpetual exchange allows users to accrue a % of fees generated by the platform.²

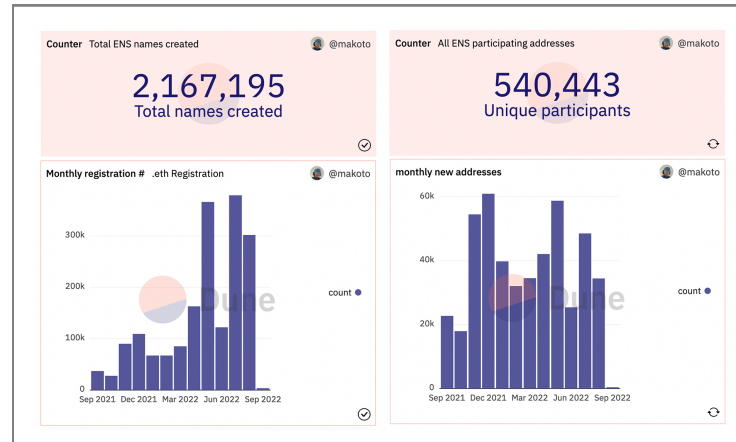
Dapp Protocol Revenue (Last 90 Days)



Web3 Domain Ownership

- Ethereum Name Service (ENS) offers users decentralized naming for wallets, websites, & more. It is the most widely integrated blockchain naming standard, with over 2.17 million names and almost 541,000 users.
- The .ETH standard supports for DNS standards including .com, .org, .app, .xyz, and .io which allow users the ability to launch decentralized websites.³
- The internet grew from a nascent technology to a global communication layer for data. Likewise, Ethereum has the potential to be the global settlement layer for value - a credibly neutral settlement layer could usher in a new age of Web3 technologies that impact and improve society.

ENS Stats (August 2022)



1 DeFi Llama, Protocols - MakerDaO <https://defillama.com/protocol/makerdao>
 2 GMX, Analytics/Arbitrum <https://stats.gmx.io>
 3 Medium, Step-by-Step Guide to Importing a DNS Domain Name to ENS <https://medium.com/the-ethereum-name-service/step-by-step-guide-to-importing-a-dns-domain-name-to-ens-d2d15feb03e8>

Bitcoin

- MicroStrategy filed with the SEC to sell as much as \$500 million in stock - the sale proceeds may be used to purchase more Bitcoin.
- Poolin wallet, the wallet service for one of the world's largest bitcoin mining pools, announced plans to issue users 'IOU tokens' after halting withdrawals following a public statement that it was facing liquidity issues.
- Iran announces it will require an establishment license and operational license before mining companies can mine Bitcoin.
- Mike McGlone, the head of commodities research at Bloomberg, says, "history may consider 2022 the year that BTC joined U.S. Treasuries and Gold as a store of value".
- The White House's Office of Science and Technology Policy proposes U.S. policymakers consider legal restrictions on crypto mining if constructive strategies fail to reduce its environmental impact. The report called upon the EPA to provide technical assistance and a collaborative process with states and the mining industry.¹

Ethereum

- The Ethereum protocol merge upgrade was successful - the network transitioned from PoW to PoS and experienced more than 95% participation from existing validator clients.
- Ethermine, the largest ETH proof of work mining operation, moved to a withdraw-only mode for users and has shut down all mining operations associated with ETH.
- The Norwegian Central Bank developed a national currency using Ethereum - the central bank published the open source code for the CBDC prototype infrastructure, which included basic functionality w/ ERC 20 tokens.²
- Coinbase submits a proposal to MakerDAO to deposit \$1.6B in USDC from the DeFi platforms' \$5.5B Peg Stability Module (PSM) into Coinbase. Coinbase Institutional, the exchange's institutional arm, would issue a 1.5% return on the USDC funds - generating \$24 million in protocol revenue.

Layer 1's

- Terra LUNC community passes a proposal to integrate a 1.2% transaction burn - the fee burn would apply to all on-chain transactions of LUNC and USTC on the Terra Classic network (excluding centralized exchanges).
- To improve network scalability, Binance Smart Chain (BNB) announced plans to add L2 ZK rollups to the network in 2023.³
- The Cardano Vasil hardfork is anticipated to go live on September 22nd - the network upgrade aims to improve transaction fees, speed, and scale at which its blockchain's transactions are validated and fix security loopholes in its protocol to improve functionality.
- The Cosmos (\$ATOM) Frens Validator community shared that the highly anticipated Cosmos 2.0 protocol upgrade would be revealed at the upcoming Cosmoverse conference on September 28th.

Other Headlines

- SEC Chairman Gary Gensler announces support for giving the CFTC greater authority over the crypto market "as long as it doesn't take away power from the SEC."
- Following President Biden's executive order issued in March to examine the risks and benefits of cryptocurrencies, the White House released its first-ever framework on crypto regulation in the US.
- Russian Central Bank and Finance Ministry agree to legalize cryptocurrency payments for international trade. Putin asked both institutions to prepare a proposal regarding the future of the country's digital asset markets.⁴
- Coinbase announces funding support for a legal challenge filed against the Treasury Dept and OFAC regarding the recent sanctioning of open source software associated with Tornado Cash.
- Singapore's largest bank, DBS Group Holdings, is looking to expand its digital asset exchange to 300,000 of its wealthiest clients across Asia and plans to upgrade its mobile application to make the process easier for users.

¹ The Block, White House report proposes possible restrictions on proof-of-work crypto mining <https://www.theblock.co/post/168621/white-house-report-proposes-possible-restrictions-on-proof-of-work-crypto-mining>

² Current Affairs, Norwegian central bank develops National digital currency using Ethereum <https://currentaffairs.adda247.com/norwegian-central-bank-develops-national-digital-currency-using-ethereum/>

³ CoinSpeaker, Binance Plans to Enhance BNB Chain with ZK Rollup Technology <https://www.coinspeaker.com/binance-bnb-chain-zk-rollup/>

⁴ Coin Telegraph, Russia aims to set rules for crypto cross-border payments by year's end <https://cointelegraph.com/news/russia-aims-to-set-rules-for-crypto-cross-border-payments-by-year-s-end>

Bitcoin Halving: Is the process of halving the rewards of mining Bitcoin blocks. This event occurs after each set of 210,000 blocks is mined (blocks are mined every 10 minutes, so around 4-years).

Block Proposer: Post-merge, Ethereum stakers, or validator nodes will function as block proposers who propose blocks for inclusion in the blockchain. This is a part of the normal ETH staking process and is the last step before the next block is confirmed.

Consensus: A consensus mechanism is a method for validating entries into a distributed database and keeping the database secure.

Ethereum Validator: A validator is an entity that participates in the consensus of the Ethereum protocol. Users stake 32 ETH to become a validator. Validators are chosen at random to create blocks and are responsible for checking and confirming the network ledger.

Hard Fork: A hard fork is a radical change to a network's protocol that makes previously invalid blocks and transactions valid, or vice-versa. A hard fork requires all nodes or users to upgrade to the latest version of the protocol software - if users prefer to utilize the blockchain without protocol upgrades, a chain split can occur.

Liquidity Pool: A liquidity pool allows depositors who provide digital assets to earn money from transaction fees generated by other users who buy and sell assets from the pool. Those transaction fees go back into the liquidity pool to further increase the value of your tokens and aid in growing the pool.

Mempool: Short for (memory pool) is a smaller database of unconfirmed or pending transactions which every node keeps. When a transaction is confirmed by being included in a block, it is removed from the mempool.

Modular Network Scaling: The separation of a blockchain's functions - consensus, data availability, and execution takes place on separate network layers instead of executing all tasks on one base layer. This design approach allows for network scaling without sacrificing decentralization or security.

Slashing: Slashing occurs when the Ethereum network confiscates some or all of a validator's staked ETH for proposing or confirming fraudulent blocks. Validators stake ETH in the first place so that the network can confiscate the tokens if a validator acts maliciously towards the network.

Realized Price: Measures the average price weighted by the supply of what all market participants paid for their coins. Realized price is calculated by dividing realized cap by total supply of tokens in circulation.

TVL (Total Value Locked): Representation of the total value of a crypto-asset that is "locked" in a DeFi (decentralized finance) application or smart contract. TVL can directly affect the yield and usability of these applications.

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