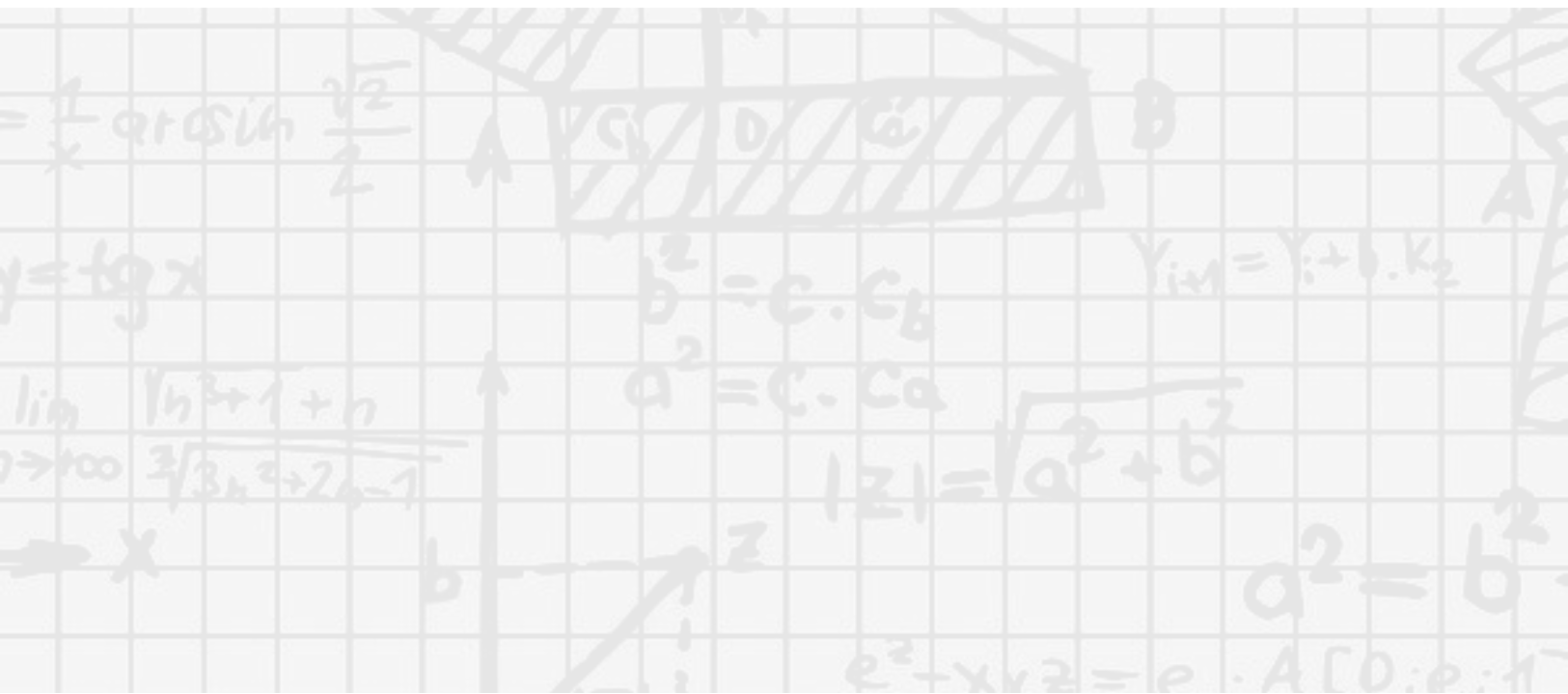# Digital Asset Markets Report

1H May 2022

Summary

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 can identify opportunities while properly navigating uncertain market conditions.

Macro Overview

- The markets appeared to have taken the adage "Sell in May and Go Away" as guidance as major indices continued their selloff this month. Since the beginning of May, the S&P 500, NASDAQ, and DJIA have recorded month-to-date returns of (-2.54%), (-5.42%), and (-2.29%), respectively. The selloff has been driven primarily by two ongoing themes. First, geopolitical events such as the Russia-Ukraine conflict and China's COVID lockdown affect both the supply chain and commodity prices. The second is monetary policies regarding CPI prints still coming in hot at 8.0%+.
- Bitcoin and Ethereum briefly spiked above $40K and $2.95k after the May FOMC meeting but have since fallen, erasing $600 billion in market cap. In May, Bitcoin and Ethereum are down almost 20% and 25%, respectively. The selloff in equities and the fallout from TerraUSD (UST), one of the largest stablecoins, collapsed from $1 to as low as ¢12, causing a pseudo-bank run as investors panicked and sold off their tokens.
- Digital assets have experienced substantial volatility, which will likely continue throughout 2022. However, we still believe that upside within the asset class remains positive. There is a growing interest from institutions and commercial banks alike who are looking to add crypto-related offerings to their list of products and services.

Macro Performance

Page 1

- U.S. crude oil spiked to $114 per barrel and is expected to average $105 per barrel in 2022. High crude prices will continue impacting consumer spending as they feel the squeeze at the pump.
- Gold is down 1% on a YTD basis as demand for the metal has weakened against the dollar, which is trading at 103.15 according to the DXY index.
- Treasury yields have traded upward across the curve, with the 2Y at 2.67% up 0.103 bps and the 10Y at 2.96% up to .087 bps. However, there have been no concrete signs of inversion.

On-Chain Analysis

Page 2

- **Bitcoin Supply in Profit/Loss:** Current trend signals price action has entered bear market conditions. Almost 7 million of the total circulating Bitcoin supply is held at a loss, with the 2020 bottom reaching 8.5 million during the Covid crash.
- **Bitcoin UTXO Realized Price Distribution (URPD)**: Currently, 10% of Bitcoin's circulating supply last moved between $27.5k - $32.3k. The largest cluster of the sell-side volume lies between $38.5k - $41.2k, which accounts for 10.3% of the total supply.

Technical Levels

Page 3

- **Bitcoin**: Heavy sell pressure continues to threaten further downside for Bitcoin. Price is currently testing the lower band of the volume profile ~$28.2k. Until the price can reclaim $44k, we remain under bear market conditions.
- **Ethereum**: Ethereum is battling to establish consistent closes above the $2k price level on a high timeframe. Until the $2.9k - $3k level is reclaimed, like Bitcoin, Ethereum remains under heavy sell-side pressure.

Momentum & Sentiment

Pages 4-5

- **pMV momentum model**: The model remains in risk-off mode (Cash).
- **Alt-season indicator**: The indicator is currently favoring BTC.
- **Delta risk scores**: Cautionary conditions remain for both BTC and ETH.
- **Short Term Holders Pain Score**: close to all time high signalling reversion in price action or incoming capitulation of short term holders.

Money Flows & Themes

Pages 6-7

- **Terra Luna Destruction**: The LUNA blockchain, which surpassed a market cap valuation of $50 billion with an additional $30 billion in TVL (total value locked) in its native algorithmic stablecoin, UST, collapsed last week.
- **Coordinated Network Attack**: The Terra network experienced a coordinated attack that exploited the algorithmic mechanics of LUNA. This fiasco prompted the Luna Foundation Guard (LFG) to sell its 42,530 Bitcoin. This panic led to network congestion and centralized exchanges halting withdrawals as billions in UST raced for the exit signs.
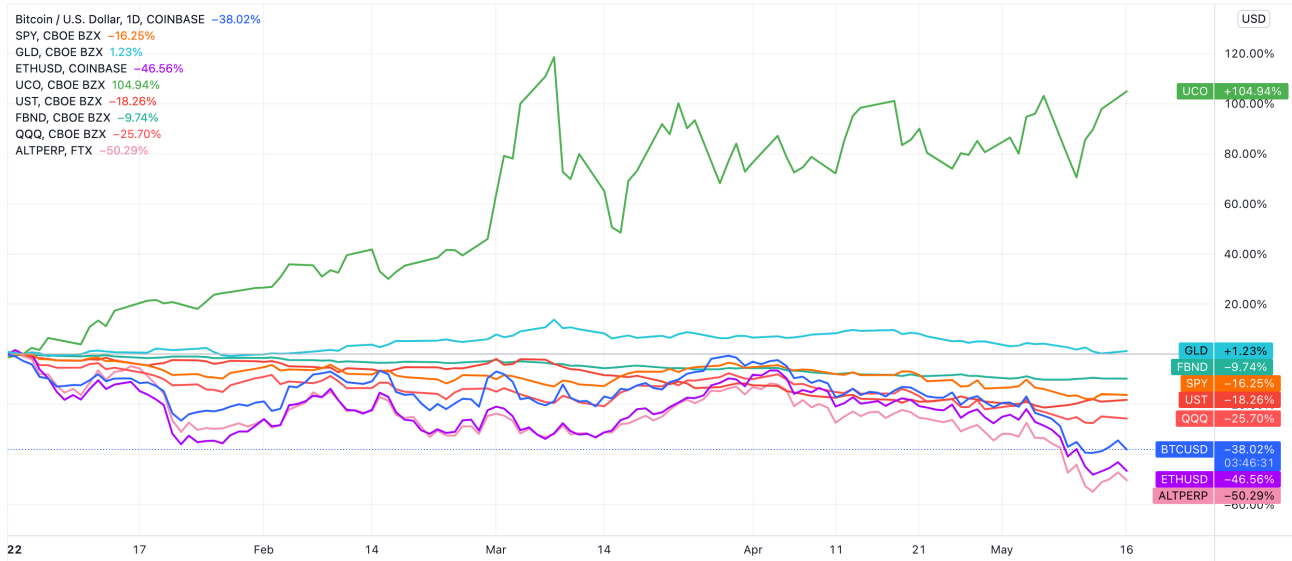
Notable News

Page 8

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

Macro Performance

2022 Asset Returns

Bitcoin / U.S. Dollar, 1D, COINBASE −38.02%
SPY, CBOE BZX −16.25%
GLD, CBOE BZX 1.23%
ETHUSD, COINBASE −46.56%
UCO, CBOE BZX 104.94%
UST, CBOE BZX −18.26%
FBND, CBOE BZX −9.74%
QQQ, CBOE BZX −25.70%
ALTPERP, FTX −50.29%

| Asset	MtD*	QtD	YtD	Volatility (annualized)*	Sharpe (annualized)*	Correlation (to Bitcoin)**
Bitcoin	-18.7%	-32.3%	-38.02%	66.5%	-1.34	1.0
Ethereum	-24.1%	-37.7%	-46.56%	77.9%	-1.53	0.92
Altcoin Index	-22.6%	-39.2%	-50.29%	81.2%	-1.72	0.97
SPY	-3.1%	-11.3%	-16.25%	23.6%	-1.90	0.92
QQQ	-5.1%	-14.2%	-25.70%	31.2%	-2.06	0.93
GLD	-2.8%	-6.0%	1.23%	15.3%	0.00	0.45
UCO	6.1%	12.1%	104.94%	85.3%	2.69	-0.16
FBND	0.0%	-4.3%	-9.74%	6.5%	-4.44	0.49
UST	1.2%	-7.5%	-18.26%	16.9%	-3.33	0.33

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 May 15, 2022
**last 90 days

Total BTC Supply in Profit/Loss

— Price — Total BTC Supply in Loss — Total BTC Supply in Profit
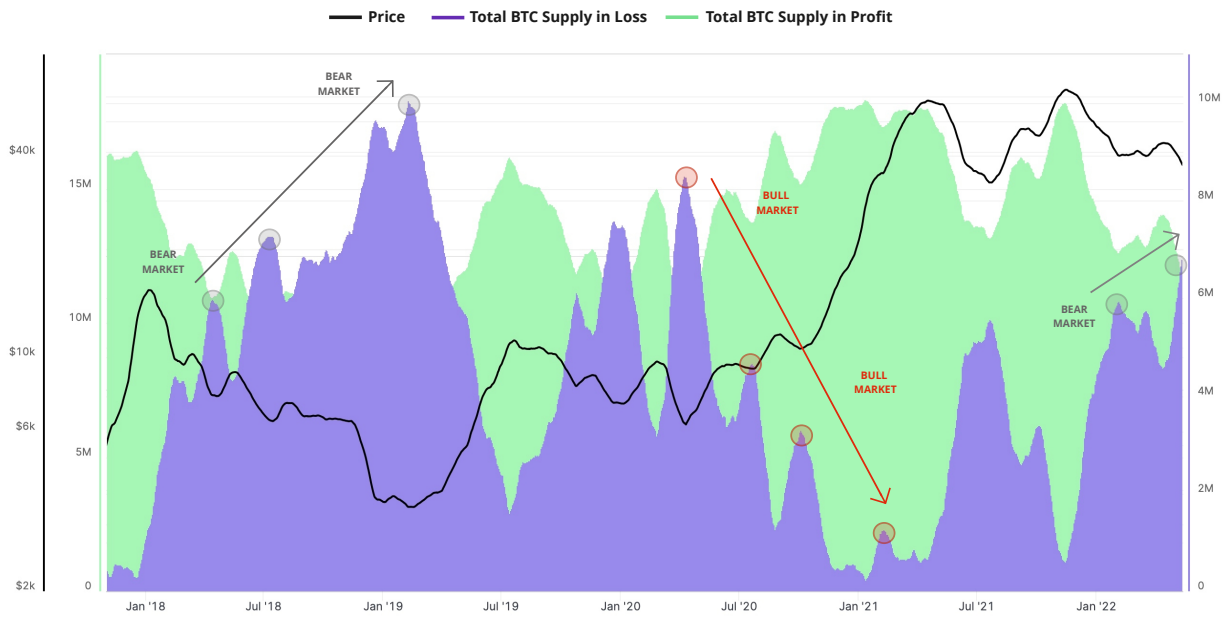
- The Total Supply in Profit/Loss chart for Bitcoin helps us visualize historical trends in price action cycles. We can see that the total BTC supply in profit (**green**) remains above the total BTC supply in loss (**purple**).

- Like January 2018, the total BTC supply in loss is trending higher, which constitutes bear market conditions. Currently, 6.9 million BTC are held at a loss. During the 2020 bottom, total BTC held at a loss reached 8.5 million before price action pivoted to the upside.

Bitcoin: UTXO Realized Price Distribution (URPD)

— Current Bitcoin Price Distribution — Current On-Chain Volume Bar
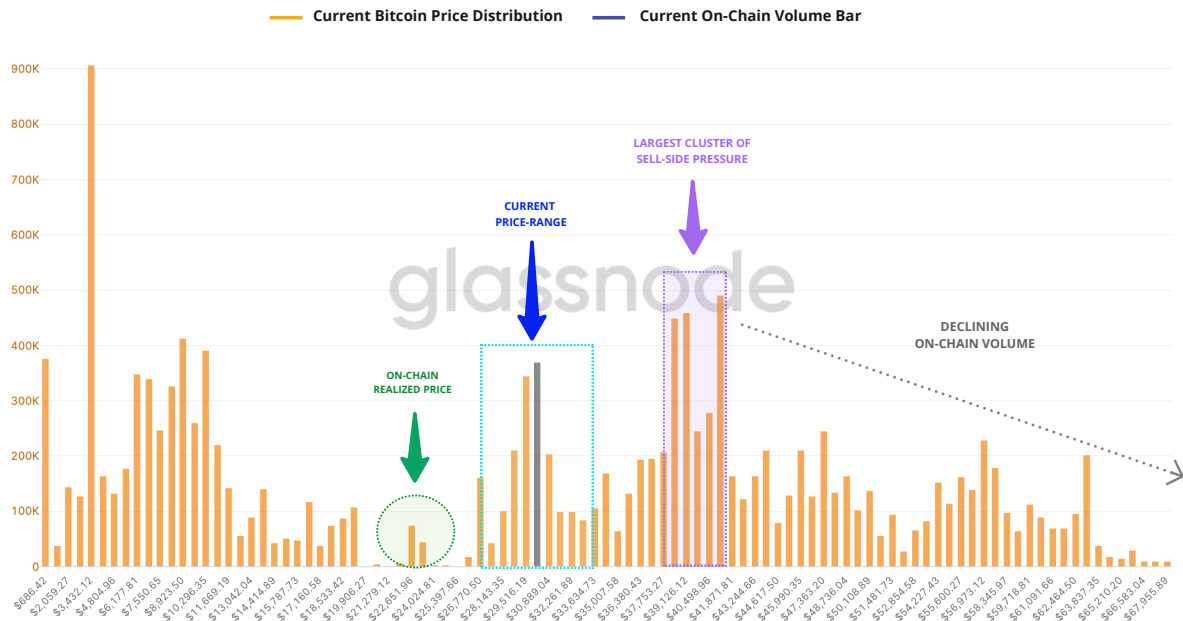
- UTXO Realized Price Distribution (URPD) shows at which prices the current set of Bitcoin UTXOs were created. It is similar to the volume indicator tool used in technical analysis. The current price range (**blue**) accounts for roughly 10% of the total supply between $27.5k -$32.3k.

- Below the current range lies the on-chain realized price (**green**) - this is the aggregate cost basis of all Bitcoin in circulation and has been a bottoming target during past cycles. The largest sell-side cluster (**purple**) accounts for 10.3% of on-chain sell-side pressure between $38.5k - $41.2k. Price action reclaiming this level will signal the accumulation period is over.
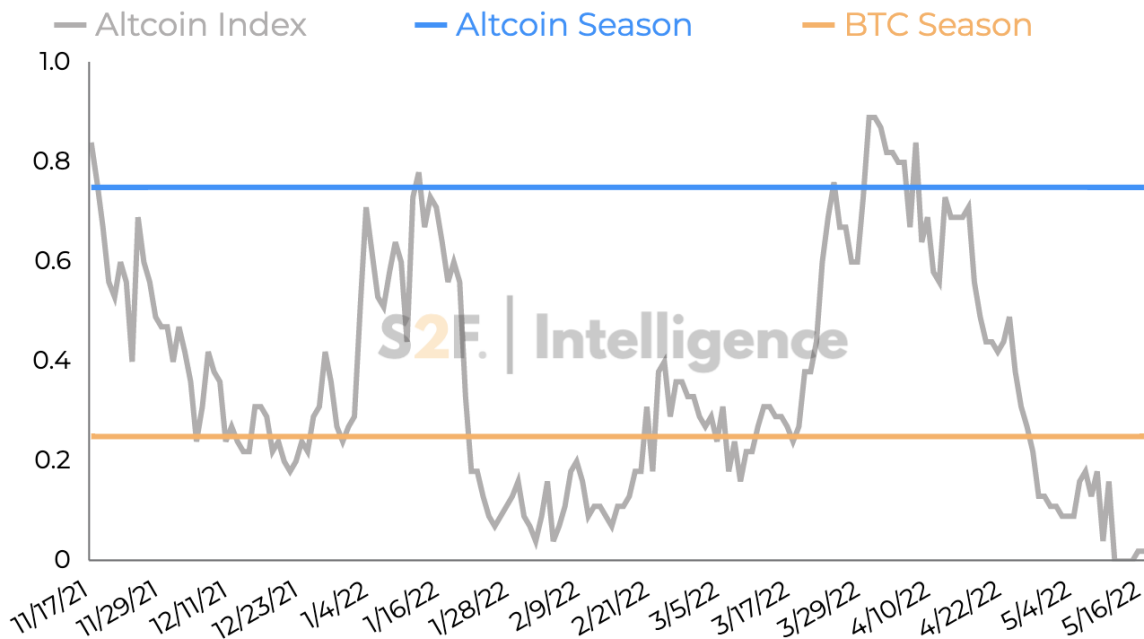
- **Bitcoin sharply sold off to begin May as the industry weathered the implosion of the Terra Ecosystem and its native stablecoin, Terra USD (UST).**

- The **200d MA** (**gold**) and the **50d MA** (**blue**) will begin to serve as macro-resistance.

Bitcoin / U.S. Dollar, 1D, COINBASE O31290.02 H31293.31 L29055.00 C29611.19 −1678.86 (−5.37%)
Vol 19.818K
MA (50, close, 0) 39303.49
MA (200, close, 0) 45146.74
VPVR (Number Of Rows, 300, Up/Down, 70) 8.56K 9.039K 17.599K

- **Ethereum remains highly correlated to BTC in the short term as it sold off and dipped below the $2k level briefly.**

- The price must now reclaim the previous months-long trend line of support.

- We believe this is a good accumulation level as the merge is still on the horizon.

Ethereum / U.S. Dollar, 1D, COINBASE O2142.74 H2142.82 L1976.22 C2015.37 −127.32 (−5.94%)
Vol 166.781K
MA (50, close, 0) 2901.61
MA (200, close, 0) 3338.31
VPVR (Number Of Rows, 300, Up/Down, 70) 115.814K 188.671K 304.485K

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 **indicate what may happen next**. When the Index line (**gray**) is below the **orange line**, it signals relatively strong momentum favoring Bitcoin vs. Altcoins.

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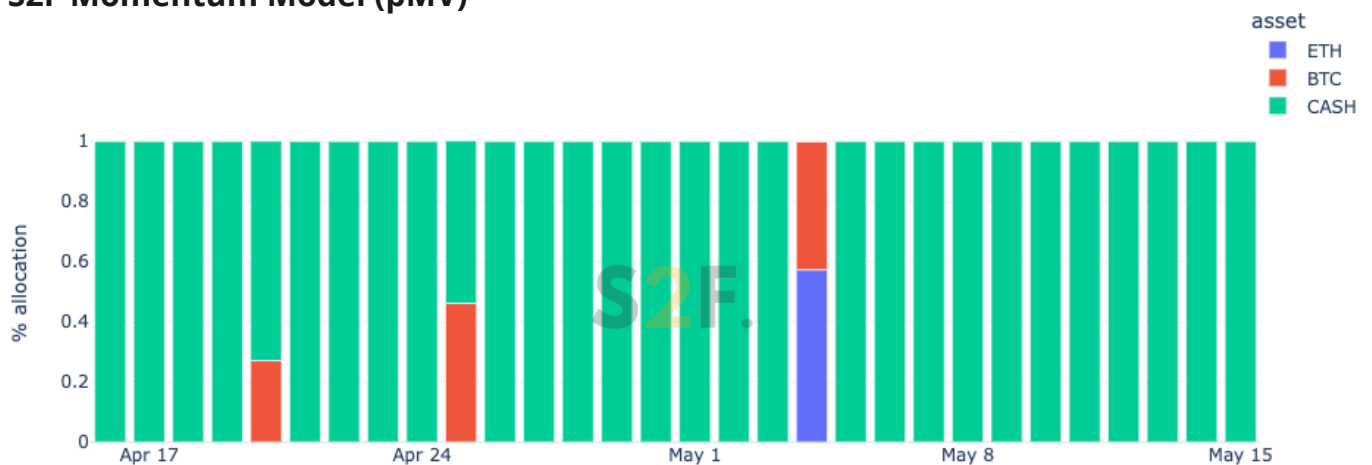
The S2F Momentum Model is a proprietary model that **compares the price momentum of BTC vs. ETH vs. USD** over a rolling window to suggest an optimal allocation of capital to each of these three assets. The entry and exit signals rely on two momentum indicators, one slow and one fast, to help determine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

S2F. | Intelligence

Short Term Holders Pain Score

- The Short Term Holders (STH) Pain Score is a proprietary model based on the STH On-Chain cost basis (the average purchase cost). **A high reading indicates that the STH cost basis is very high compared to the current price. A spike in this indicator means that STH is deeply underwater, which can lead to one of the two following outcomes: 1) STH hold into their investment and become Long Term investors, also given the fact that they would sell at a loss; 2) STH get scared by the price action, so they decide to cut their losses and capitulate again, similar to what happened after May 2021.**
- The first chart below shows Bitcoin's price (**gray line**) paired with the STH Pain Score (**orange area**), and the second chart shows the percentage of total supply held by STH (**orange area**). As the chart shows, **the supply controlled by STH has been declining since May 2021**. It is reasonable to assume that more experienced market players would almost immediately absorb any capitulation from short-term holders.
- The most important takeaway is that there is not much supply left in the hands of short-term investors. Therefore, while we could continue to grind lower as the overall economy suffers gradually, we feel confident that downside risk from here is limited. Any major capitulation event (-20/25% from here) would be front-ran by more experienced investors who would relish the opportunity to deploy capital at a major bottoming event.
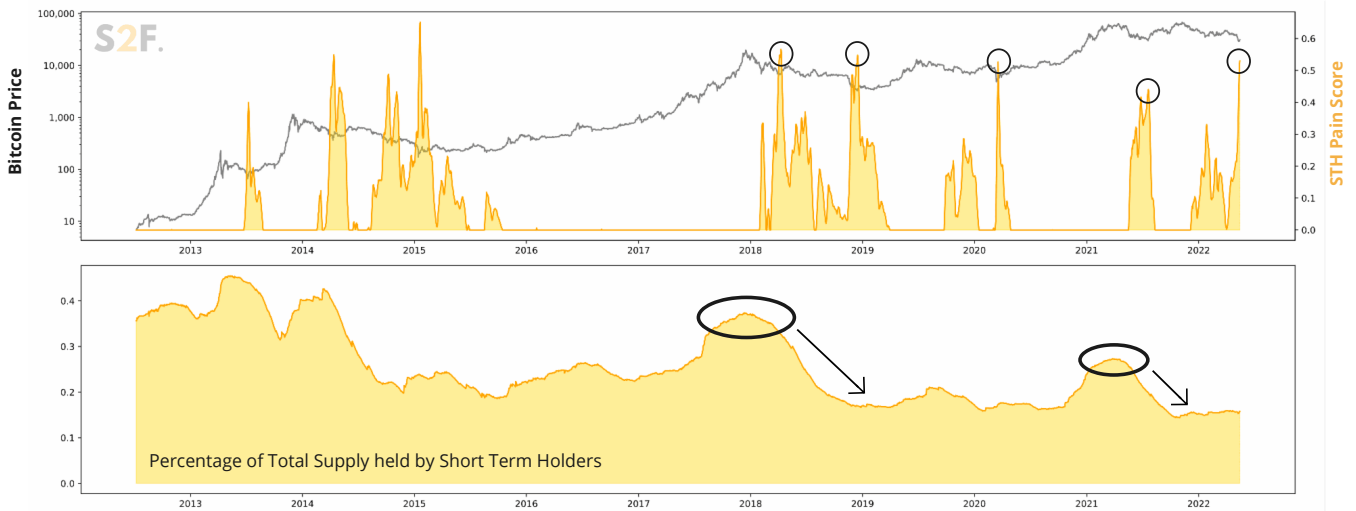
Data source: Glassnode

Delta Risk Score (Bitcoin)

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 Q4 2019.

Money Flows & Themes
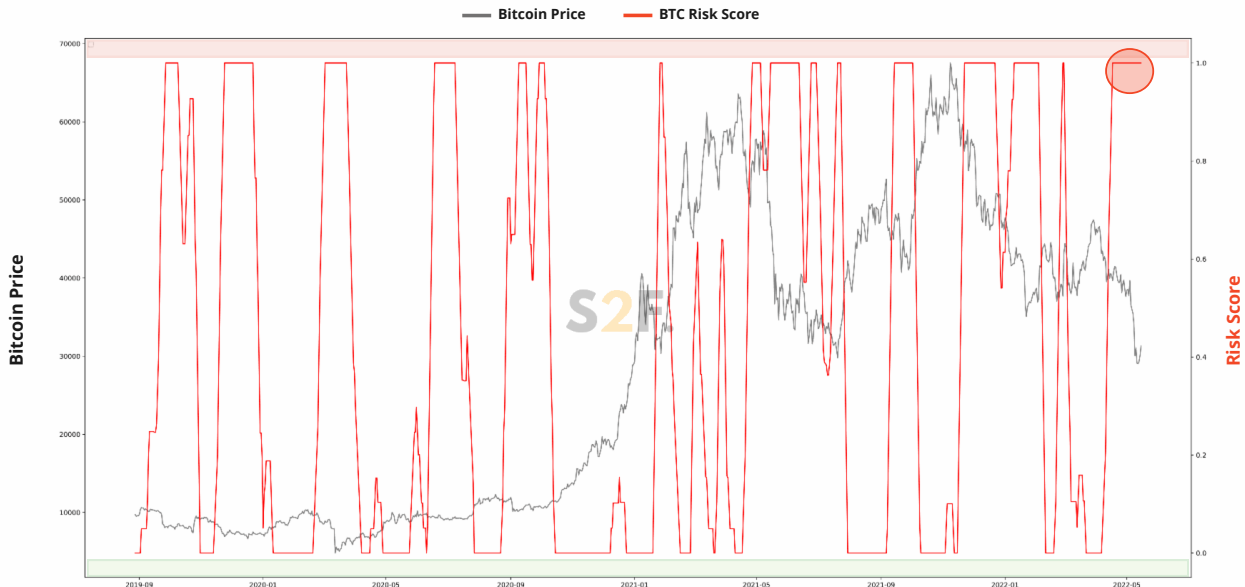
Terra Luna Ecosystem Destruction

While digital assets have experienced substantial volatility during May, no crypto protocol experienced more destruction than the Terra blockchain.

- At its peak, LUNA surpassed a market cap valuation of $50 billion with an additional $30 billion in TVL (total value locked) in its native algorithmic stablecoin, $UST.

- For perspective, during the GFC of 2008, Lehman Brothers had a $60 billion market cap before filing for bankruptcy. What took Lehman several years to fail, the Terra blockchain managed to accomplish in roughly ~72 hours.

Terra + UST Price Action
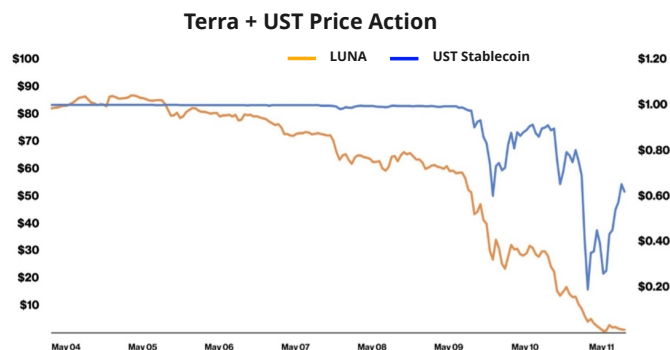
The Terra UST Stablecoin

At the core of the fiasco was the ecosystem's native stablecoin, UST. A stablecoin is a digital asset collateralized by the value of an underlying asset (typically this is fiat, commodities, or crypto). Fiat-backed stablecoins are supported with a 1:1 ratio that 1 token = $1.00. A commodity-backed stablecoin peg maintains a 1:1 balance with physical assets held under custody, for instance, 1 unit = 1 oz of gold. The Terra USD (UST) stablecoin, however, is an example of an algorithmic stablecoin.

- The UST stablecoin design maintains its 1:1 peg by algorithmically backing each unit of UST with the LUNA token. The token mechanics allow market supply and demand dynamics to maintain the 1:1 peg.

- You can always redeem LUNA tokens for UST (dollar-for-dollar), so if 1 LUNA token is $100, you can redeem 100 UST.

- You can also always redeem 1 UST for $1 worth of the LUNA tokens, even when UST <$1.00.

- So if UST falls below the $1.00 peg, the protocol incentivizes users to burn their UST ($0.99) to mint ($1.00) worth of LUNA.

- If strong demand for UST causes the peg to rise above > $1.00, users are incentivized to burn their ($1.00) LUNA tokens to mint or create ($1.01) worth $UST, providing an arbitrage opportunity.

Terra's Algorithmic Stablecoin Model

Demand for the UST algorithmic stablecoin exploded, pushing the market cap of UST from just under ***$2 billion in May of last year*** to ***over $18.7 billion at the start of May 2022***. Why?

Anchor Protocol's 19.5% APY

Anchor is a lending and borrowing protocol built in the Terra ecosystem that incentivizes investors to deposit their assets for a highly competitive interest rate. It was offering its users a 19.5% APY on their UST deposits.

- Since the average national savings account offered an interest rate of 0.06%, Anchor's implied "risk-free" APY sparked a frenzy in market demand for UST.

- The LUNA Foundation Guard (LFG) oversaw the Anchor protocol's multi-billion-dollar fund. The ~20% APY interest payments to users were made from these Anchor protocol reserves.

- The LFG maintained this 20% APY by selling treasury LUNA tokens to fund the Anchor Protocol Reserve funds.

- As UST's market cap grew, so did Anchor protocol's TVL. At its highs, 70%+ of the entire circulating supply of UST had been deposited into Anchor's lending protocol. (see chart)

Anchor Protocol TVL Growth
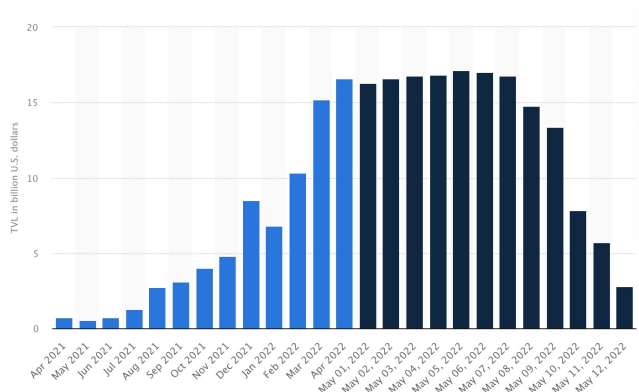
Hyperinflation

At its core, the algorithmic design of the LUNA token had one glaring issue - how would the blockchain maintain its stability if the redemption price of LUNA for UST became too high relative to the market price of the LUNA token?

- If the price of one LUNA token was $10,000, the protocol allowed the user to mint 10,000 UST by burning that single LUNA token. But if the price of LUNA fell from $10,000 to $1, that same individual would be able to redeem 10,000 LUNA with their UST.

- If the price of the LUNA token fell too significantly, holders might panic and retreat to the security of UST. If the blockchain experienced an onslaught of redemptions for UST, this event could cause hyperinflation in the token supply. What if a sharply declining LUNA token coincided with a failure of the UST stablecoin to maintain its $1.00 peg?

- In this scenario, the algorithmic design of the blockchain would aggressively mint and sell LUNA tokens to prioritize restoring the UST peg to $1. This is what the network experienced last week. (see chart)

LUNA Token Supply

Total supply of LUNA grew from *725 million tokens* on May 5th to *almost 7 trillion on May 13.*

Luna Foundation Treasury Reserves

- In our 2H March report, we discussed how the LFG was taking action to bolster the LFG Treasury reserves. The LFG sold $1B in Luna tokens to Jump Capital, Three Arrows Capital, and DeFiance Capital. The proceeds from this sale would bootstrap LFG's ambitions to establish a bitcoin-denominated forex reserve. This reserve would help reinforce an aggressive cascade in user redemptions.

- Jump capital had proposed a $2.5 billion Bitcoin reserve pool that would allow users to redeem $0.98 worth of wBTC for 1 UST. Their thought was that this reserve could provide a strong backdrop for UST during a crisis of aggressive redemptions.

- At the start of May, the LFG had amassed 80,394 Bitcoin, but on May 9, the Luna Foundation Guard moved 52,189 BTC before draining the remaining 28,205 BTC on May 10; what happened?

UST Bitcoin Reserve Model
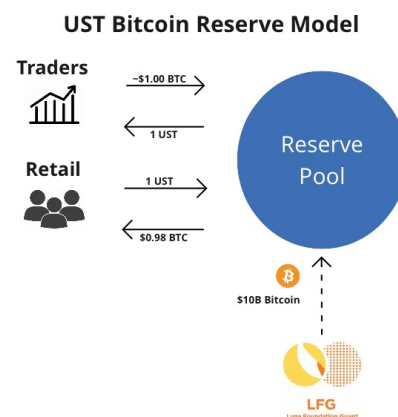
Coordinated UST Attack

- To bring further legitimacy to the UST stablecoin and compete directly with Ethereum's stablecoin, DAI, on April 1st, the Terra ecosystem announced its plans to migrate $UST to a new liquidity pool (see glossary) called 4pool.

- The 4pool launch was a calculated decision to compete with Curve's popular 3pool, which featured USDC, USDT, and Ethereum's native DAI stablecoin. However, on May 8th, when the LFG removed $150 million UST in liquidity to contribute to the launch of their new 4pool, an attacker seized the opportunity. Ten minutes after the LFG removed liquidity, they cleared the remaining liquidity on Curve ($350 million worth of redemptions).

- The attacker simultaneously started aggressively selling UST on Binance to create a small de-peg in the 1:1 ratio of USDT/UST. The timing was perfect as it took place as the price of Bitcoin price began accelerating to the downside. The code red conditions prompted the Luna Foundation Guard to prioritize selling their Bitcoin reserve to restore the UST 1.00 peg.

- As soon as the 42,530 Bitcoin moved on chain, panic ensued as users scrambled to de-risk and retreat to safety. Congestion on the LUNA blockchain led to centralized exchanges halting withdrawals as billions in UST raced for the doors on Anchor.

- By the time Jump Capital and the Luna Foundation Guard realized what was happening, it was too late. The avalanche of redemptions for a sub < $0.80 UST peg in exchange for 1 LUNA token had evolved into an algorithmic nightmare of sell pressure. The rest is history.

Notable News

Bitcoin

- Grayscale's Bitcoin trust shares, $GBTC, recorded their largest historical discount to NAV of 30.6%. Grayscale is currently the largest single institutional holder, with more than 630,000 Bitcoin under custody.
- Following the launch of Australia's first spot-backed ETFS 21Shares Bitcoin ETF, the Canadian Purpose ETF saw a record inflow of 6,900 Bitcoin. The structure of the 21Shares product allows investors in the ETF to purchase shares of the Canadian Purpose ETF, which purchases physical BTC for its reserves. Purpose ETF now stands at 41,620 Bitcoin.
- El Salvador invites 32 Central Banks and 12 financial authorities from around the world to attend the country's first international Bitcoin event. President Bukele said representatives from 44 countries will meet in El Salvador to discuss financial inclusion, digital economy, and banking the unbanked using the Bitcoin monetary network.

Ethereum

- Ethereum developers recently completed their fourth successful merge-shadow fork on May 12th. Amidst all the adverse price action in markets, all Ethereum clients synced with the proof-of-stake blockchain.
- Meta announces it will launch NFT collectibles support for Ethereum and its sidechain, Polygon. They cited that minimal fees and a carbon-neutral footprint are aspects of Polygon that will appeal to those new to the space.
- Ethereum's DeFi protocol, Compound, receives a B- grade from the S&P Credit Ratings - this is the first time a lending and borrowing protocol has been issued a TradFi grade.
- Cloudflare announces plans to launch and stake Ethereum nodes as an experiment to help 'build a better internet'.
- Developers announce they will perform the merge transition on June 8th on Ethereum's Ropsten testnet. After that, if there are no client issues on Ropsten, they will announce another merge transition on the next Ethereum testnet. The merge could take place on mainnet Ethereum in August or September with no setbacks.

Layer 1's

- The Terra Luna L1 blockchain collapsed due to the algorithmic de-pegging of the native stablecoin, UST.
- Following the news of integrating NFT support for ETH and Polygon, Meta announced the development to support a launch on Solana, and Flow is currently underway.
- The Tron DAO Reserve purchased $38 million in $TRON tokens to safeguard the network's stablecoin USDD. Since the (UST) de-pegging event, the Tron DAO Reserve has continued to purchase large quantities of digital assets to bolster the project's reserves.
- According to executives at the firms behind Avalanche and Flow, Yuga Labs, and ApeCoin DAO board members are considering offers to migrate from Ethereum after the most recent "Otherside" metaverse land sale resulted in roughly $100 million in transaction fees.

Other Headlines

- U.S. Senator Elizabeth Warren (D-Mass.), a member of the Senate Banking, Housing, and Urban Affairs Committee, and Senator Tina Smith (D-Minn.) sent a letter to Abigail Johnson, CEO of Fidelity, regarding Fidelity's decision to allow Bitcoin investments for 401(k) plans. In the letter, she stated the purpose of the letter was to inquire about "the appropriateness" of the company's decision.
- U.S. Treasury Secretary Janet Yellen pushes for stablecoin regulation. During her testimony in front of the Senate Banking Committee, she said it would be "highly appropriate" for stablecoin regulation to occur by the end of 2022 because there are "many risks associated with cryptocurrencies.
- Coinbase, the U.S.'s largest cryptocurrency exchange, reported a quarterly loss of $430 million and a 19% drop in monthly users.
- CEO of FTX, Sam Bankman-Fried, files 13D on popular trading application Robinhood revealing a 7.6% stake in the company.

Alt-Season Indicator: This indicator is based on a proprietary model that helps us identify the current market phase and adjust the allocation accordingly.

Beacon Chain: Is the current ETH 2.0 proof-of-stake blockchain. It was launched Dec 2020 and is the first iteration towards the new Ethereum 2.0 blockchain upgrade.

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).

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

Delta Gradient: Metric measures the difference between the gradient of both spot price and the realised price. Shows the relative change in momentum between speculative value and true organic capital inflows.

Epoch: Ethereum 2.0 progresses in epochs, not blocks. An epoch is a bundle of up to 32 blocks that actors on the network (called validators) propose and attest to over a period lasting roughly 6.4 minutes.

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.

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.

Stablecoin: Stablecoins attempt to maintain a constant exchange rate with fiat currencies, for example through a 1:1 U.S. dollar peg. stablecoin is typically a cryptocurrency collateralized by the value of an underlying asset. (Fiat, commodity, crypto, and sometimes algorithmically)

Supply Staked: Measures the amount of the digital asset that are locked up with network "validators", or miners, that process the protocol transactions. "Stakers", aka investors that stake, can earn coins as rewards in exchange for securing the network.

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.

Unspent Transaction (UTXO) : An unspent transaction output (UTXO) is the technical term for the amount of digital currency that remains after a cryptocurrency transaction. UTXOs define where each blockchain transaction starts and finishes.

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