Fidelity ▲ DIGITAL ASSETS®

Q2 2023

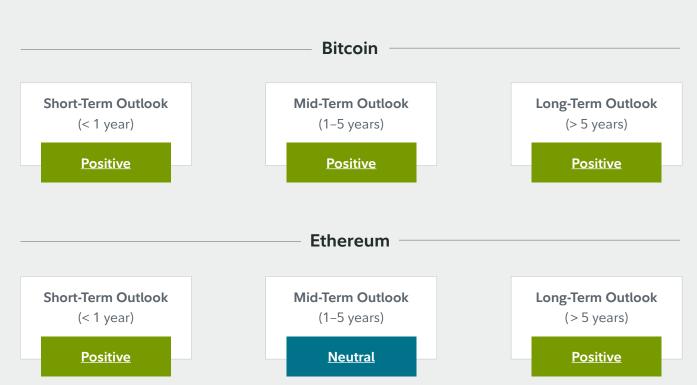
Signals Report

A quarterly breakdown of key market metrics that could be affecting price and investor sentiment

Fidelity Digital AssetsSM Research

Quarterly Observation of Current Market Conditions

Click the boxes to see how we measured the conditions.





What This Report Is and How to Use It

Digital assets are unique in that they generate not only traditional market signals based on price or trading, but also an entirely new set of signals based on public on-chain data. These signals can be valuable for all types of investors, but the challenge lies in determining which signals to use, how to match the signal to the correct investment time horizon, and how to interpret the data correctly.

In this report, we have collected what we think are the most reliable signal indicators, grouped them by time horizon, and provided an overall assessment of the conditions for each time horizon.

We then provide a breakdown of the signals included in each time horizon, their charts, and a short explanation.

Executive Summary: Q2 2023

As the second quarter of 2023 comes to an end, the data suggests an overall positive outlook for both bitcoin and ethereum.

Bitcoin, up roughly 85% year-to-date, has maintained important price levels and is seeing its on-chain metrics return to a more "normal" state after the speculation and experimentation with ordinals has waned. Long-term holders remain unaffected by the recent lawsuits, as seen in the "Hodler Net Position Change" data, and have continued to accumulate around

the \$30,000 level. Miners have maintained a healthy profit margin, as seen in the Puell Multiple. However, with the halving estimated to occur in less than nine months, this will be a key metric to watch.

Ether, up roughly 62% year-to-date in price, is seeing potentially positive price signals and growing on-chain metrics. The network continues to maintain a higher rate of burn than issuance, resulting in the removal of more than 700,000 ether from the network. The "New Address Momentum" metric is seeing a comeback, signaling an expansion in network activity and usage. While many analysts suspected a fall in staked ether after the Shapella upgrade, we had the opposite view, anticipating a rise in staked ether as liquidity risk for validators fell and capital efficiency rose. This quarter observed an overall growth of 15% in its validator count.



Measurement Breakdown—Bitcoin

Short-Term (< 1 year)		Overall Condition: POSITIVE
NAME	COMMENTARY	CONDITION
Is Price Trading Above the 200-Day?	Yes, has not retested since March 10	negative neutral positive
Golden Cross or Death Cross?	Golden cross remains intact since February 6	negative neutral positive
Price > Realized Price	Yes, 50% higher than realized price	negative neutral positive

Mid-Term (1–5 years)		Overall Condition: POSITIVE
NAME	COMMENTARY	CONDITION
NUPL Zone	Remains in the "Optimism" zone	negative neutral positive
MVRV Z-Score	Remains closely above "Undervalued" zone	negative neutral positive
Reserve Risk	Broke out of "Low-Risk" zone in March	negative neutral positive
Stock-to-Flow	Bitcoin's price is heavily discounted, according to this model	negative neutral positive
Puell Multiple	Miners remain in a healthy position, according to this model	negative neutral positive
Hodler Net Position Change	Long-term holders are net buying and have increased holdings since April	negative neutral positive
Addresses in Profit	77% of addresses are in profit	negative neutral positive
Bitcoin Yardstick	Bitcoin is considered a "fair" value	negative neutral positive

Long-Term (> 5 years)		Overall Condition: POSITIVE
NAME	COMMENTARY	CONDITION
Price > 200-Week	Yes, retested in June, but remains above as of Q2 close	negative neutral positive
Monthly Address Metrics	Growth and a return to "normal" seen this quarter	negative neutral positive
Address Momentum	Growing on-chain activity and usage	negative neutral positive
Liquid vs. Illiquid Supply	Growing illiquidity	negative neutral positive
Balances Over \$1,000	Positive trend of growth, near ATH from 2021	1 negative neutral positive



Measurement Breakdown—Ethereum

Short-Term (< 1 year)		Overall Condition: POSITIVE
NAME	COMMENTARY	CONDITION
Is Price Trading Above the 200-Day?	Yes, retested 200-day support mid-June, but remains above	negative neutral positive
Golden Cross or Death Cross?	Has remained in golden cross formation since February 8	negative neutral positive
Realized Price < Price	Yes, remains 30% above	negative neutral positive

Mid-Term (1–5 years)		Overall Condition: NEUTRA	
NAME	COMMENTARY	CONDITION	
NUPL Ratio	Remains in "Fear" zone	negative neutral positive	
MVRV Z-Score	Trading above the "market bottom" zone since January 9	negative neutral positive	
Percent in Profit	Fell 3%, but majority (66%) of addresses still in profit	negative neutral positive	
Pi Cycle Top Indicator	Not yet "heating up"	negative neutral positive	

Long-Term (> 5 years)		Overall Condition: POSITIVE
NAME	COMMENTARY	CONDITION
Monthly Address Metrics	New addresses trending up	negative neutral positive
New Address Momentum	Growing on-chain activity and usage	negative neutral positive
Addresses with over \$1,000	Unchanged through Q2	negative neutral positive
Staking by the Numbers	Up 15% in Q2	negative neutral positive
Net Issuance and Burn Rate	Net-negative issuance, over 700,000 ethereum removed from the network	negative neutral positive



Bitcoin Data to Watch

Bitcoin Tests the Short-Term SMA

Bitcoin's short-term simple moving average (SMA) has maintained a healthy relationship with the 200-day moving average. Since forming a golden cross pattern earlier this year, in which the short-term moving average rises above the long-term moving average, bitcoin's price has continued to rally. The day-to-day



price action has been relatively flat this quarter, trading below the 50-day resistance level until a recent breakout on June 19 that put the price back above a psychological \$30,000 support level.

The 200-day moving average is viewed as support when the price is above it and as resistance when it is below it. As Q2 2023 ends, bitcoin's price remains well positioned above both the short- and longer-term support levels.

Realized Price (Bitcoin)

The realized price is a metric that aims to capture the average cost basis of all current token holders.

When a token's last trade price is captured, tokens that are presumed to be lost can be fairly discounted. Because these funds have not moved in so long, they are not available for purchase, and thus, are considered illiquid. Bitcoin's realized price is

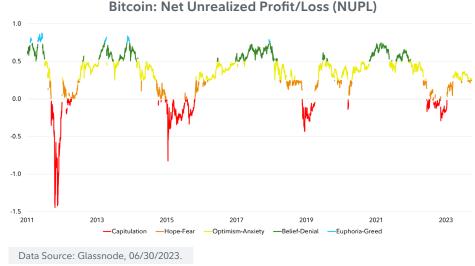


currently positioned around \$20,000. In theory, this metric acts as a last line of defense for traders. When the market price is below the realized price, it means that most of the supply held is being held at a loss and thus, if sold, will be sold at a loss. This in turn incentivizes new and older buyers to enter the market. The realized price has maintained a position of support since January 13, 2023. The current price is about 50% above the realized price, which is around \$20,341 at the time of writing.



NUPL Score (Bitcoin)

Historically, this metric does a good job of assessing overall market sentiment. Bitcoin's NUPL score offers insight into the relative level of unrealized profits, or losses, visible on-chain at any given time. A NUPL score below zero, witnessed in Q4 of 2022, implies net unrealized losses and has historically signaled periods of capitulation. A NUPL score over 0.50 indicates large unrealized profits held on-chain, which may suggest

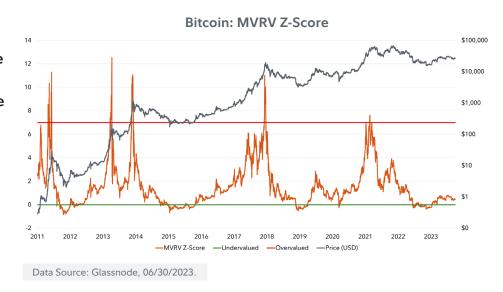


a period of profit-taking could be imminent. This ratio was quite <u>volatile</u> during the second quarter, but after briefly re-entering the "Fear" zone, it confidently moved back into the "Optimism" zone. Compared to the deep "Capitulation" zone the NUPL score entered at the beginning of 2023, it has since continued an upward trajectory.

Read more here.

MVRV Z-Score (Bitcoin)

The Market Value to Realized Value Z-Score is used to assess when bitcoin is over/undervalued relative to its "fair value." When the Market value is significantly higher than realized, it has historically indicated a market top (red zone), whereas the opposite has indicated market bottoms (green zone). There have been no significant changes in this metric since March 2023, when it almost entered the "Undervalued"



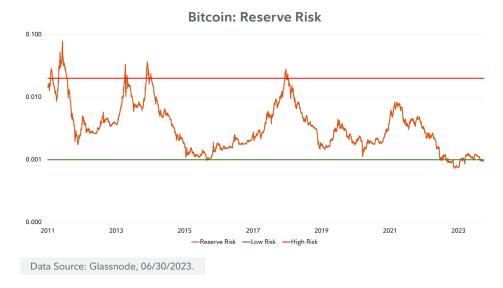
zone. The MVRV Z-Score remains neutral for Q2.



Reserve Risk (Bitcoin)

Reserve risk is used to assess the confidence of long-term holders relative to the native coin's (bitcoin) price at a given point.

When confidence is high and the price is low, there is an attractive risk/reward to invest (the reserve risk is low). When confidence is low and the price is high, risk/reward is unattractive (the reserve risk is high). Reserve risk has been slowly climbing since the beginning of



2023 but has remained unchanged since the beginning of April. Bitcoin remains in a relatively low risk zone according to this metric.

Stock-to-Flow (Bitcoin)

The stock-to-flow (S/F) deflection is the ratio between the current bitcoin price and the S/F model.

If the deflection is ≥1, it means that bitcoin is overvalued according to the S/F model; otherwise it is undervalued. We **think** the stockto-flow model may be less relevant today, given that bitcoin's inflation rate is already in the low single digits. However, this model may still be interesting when we also take other metrics into account.



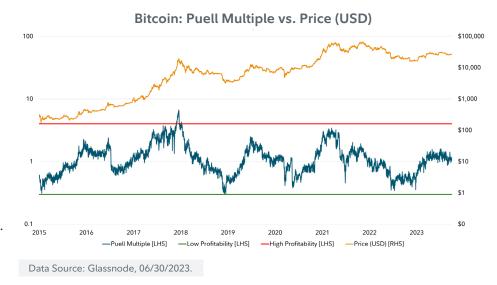
Data Source: Glassnode, 06/30/2023.



Puell Multiple (Bitcoin)

Created by David Puell, the Puell Multiple shows when miner profitability is low compared with the previous year. When the Puell Multiple is high, it means that the mining revenue is higher than last year's average. Historically, when this metric is in the high red zone, it has generally corresponded to cycle tops.

This metric currently suggests that miner profitability sits on par with



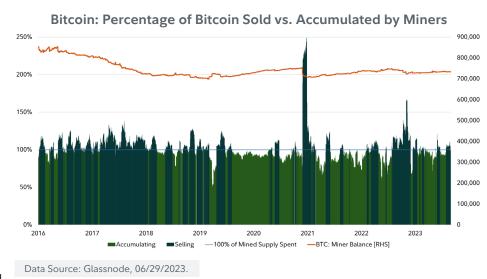
that of last year. This translates to miners being in a familiar profit margin zone. We do not expect this metric to change significantly until the next halving event occurs, which will programmatically reduce miners' revenue. In addition to this, there may be a more significant relationship forming between the hash rate and the spot bitcoin price due to the maturation of spot bitcoin and mining derivatives. Put simply, producing bitcoin may become more profitable than buying spot bitcoin, and there are a growing number of ways to gain exposure to the bitcoin mining industry. This means that as the profitability of miners increases, capital is incentivized to flow into the mining industry rather than into spot BTC markets.

Read more about the halving here.

The Puell Multiple is calculated by dividing the daily issuance value of bitcoin (in USD) by the 365-day moving average of the daily issuance value. As a result, it shows how today's block reward compares with the average of the last 365 days.

Percentage of Bitcoin Sold vs. Accumulated by Miners (Bitcoin)

Here we can see the pattern in which miners flip between needing to sell all newly mined bitcoin and reserves and accumulating more bitcoin. The horizontal light blue line shows miners selling 100% of the block reward. If the dark blue columns are above 100%, that indicates that miners, on average, sold the full block reward and



had to sell some of their reserves. Bitcoin's price ended the second quarter roughly where it began: \$30,000. It is important to remember that profitable mining incentivizes new and old participants to (re)join, which lowers the average profit margin as block rewards are distributed among a bigger pool of participants.



Hodler Net Position Change (Bitcoin)

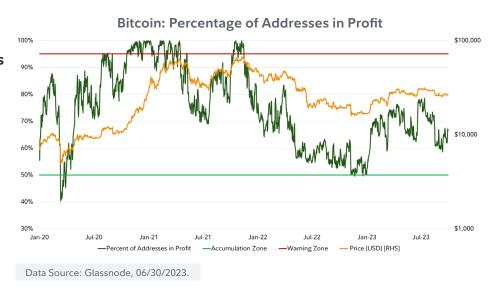
Hodler Net Position Change shows the monthly position change of long-term investors, known in Bitcoin culture as "Hodlers" or "HODLers." It indicates when long-term investors sell (negative) and when they accumulate (positive) net-new positions. April's Signals Report noted a substantial uptick in buys, possibly showing that longer-term investors have started to accumulate



again. The average net position change in April was 17,606 BTC. The average for the second quarter was 37,880 BTC, a 115% change in growth. Recent data shows that long-term holders are buying at levels last seen earlier this year, when the bitcoin price dropped below \$17,000. This could mean that a new bottom is forming at \$30,000, where short-term investors have exhausted their holdings and long-term investors are fighting to take back control.

Addresses in Profit (Bitcoin)

Here is the percentage of addresses in profit, which indicates unique addresses whose funds have an average buy price lower than the current price. The "buy price" is defined as the price at the time coins were transferred to an address. The percentage of addresses in profit has grown from roughly 52% at the beginning of 2023 to just over 75% at the end of Q2. As the number of addresses in profit grows, a sell-off



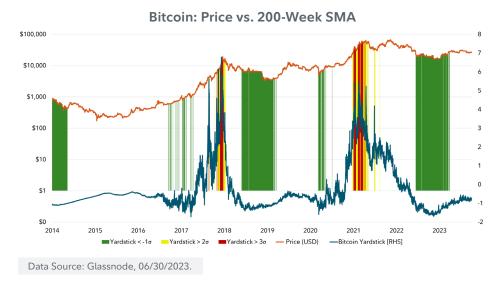
may become more likely as traders and newer investors look to take profits. However, shorter-term addresses in profit may not have as much bitcoin to sell as longer-term holders. These long-term holders did not sell at roughly \$70,000 in 2021 or already accumulated their bitcoin at higher prices.



Bitcoin Yardstick

The Bitcoin Yardstick, or Hashrate Yardstick, is a similar concept to a price-to-earnings (PE) ratio.

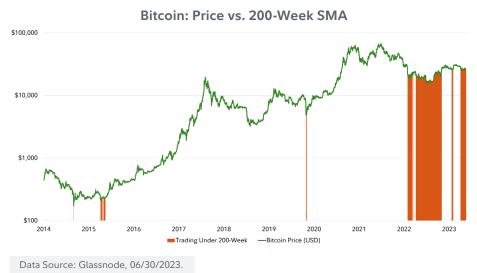
However, instead of stock prices divided by company earnings, it calculates Bitcoin's total market cap divided by its hash rate (a measure of energy being expended to secure the network). The idea is that the lower the ratio, the "cheaper" bitcoin looks, just as a lower PE ratio can be interpreted as a "cheap" stock.



Currently, the Yardstick is telling us that bitcoin is between -1 and 2 deviations of the mean. According to this metric, there were only four days this quarter on which bitcoin was considered "cheap." Currently, bitcoin is trading in a neutral zone. The Bitcoin Yardstick was originally put forward by **Capriole Investments**.

200-Week Moving Average (Bitcoin)

The 200-week moving average is a long-term indicator, and, until this bear market, bitcoin had rarely traded below it. In June 2023, the 200-week SMA briefly failed as a support level. However, since June 18, the bitcoin price has confidently steered north of the 200-week SMA. The day counter resets once again with 12 days as the longest streak since it rose above this metric. The 200-week currently sits at

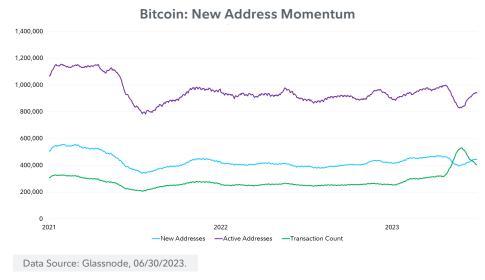


roughly \$26,665, which means that bitcoin's price trades just 11% higher at \$30,000.



Monthly Address Metrics (Bitcoin)

Charted to the right are the monthly metrics for active addresses, new addresses, and the transaction count. Since the beginning of May, we have seen a substantial rise in the transaction count. Bitcoin's transaction count closed this quarter up 200% after retracing 24% from its May peak. However, active addresses and new addresses have fallen by approximately 4%.

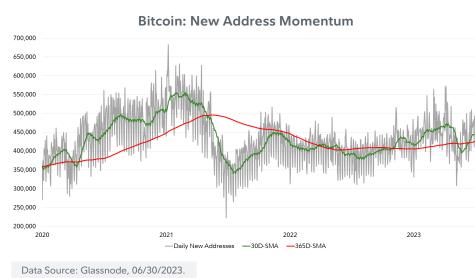


Interestingly, the transaction count has grown significantly, but active addresses moved in the opposite direction. Normally, more transactions would likely coincide with an uptick in address creation. This data is likely driven by ordinal wallets' re-use of addresses. Where nonordinal wallets usually do not reuse addresses for privacy reasons, holding digital artifacts in a single address would be easier for the overall user experience. The lack of an increase in new addresses could also indicate that the usage of BRC-20 tokens and ordinals was from a relatively small percentage of bitcoin users. If fees return to lower levels, we will be actively monitoring the ongoing trends in active and new address data.

Read more about ordinals here.

Address Momentum (Bitcoin)

Taking a closer look at addresses, we can also measure relative momentum. In this chart, we compare the short-term momentum (30-Day SMA) to the longer-term average (365-Day SMA). When the monthly average is greater than the yearly, that indicates higher on-chain activity and a positive short-term trend in network usage. When the opposite occurs, that indicates a decline. Here, we see the monthly

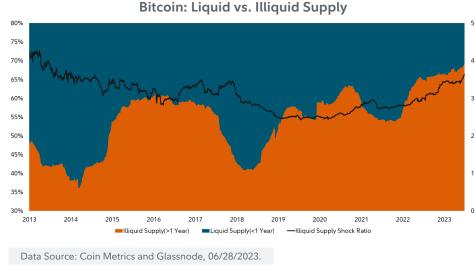


average (green line) slowly recovering again as the transaction count and fees start to return to lower levels. This may be indicative of a return and overall expansion of on-chain activity and network usage.



Liquid vs. Illiquid Supply (Bitcoin)

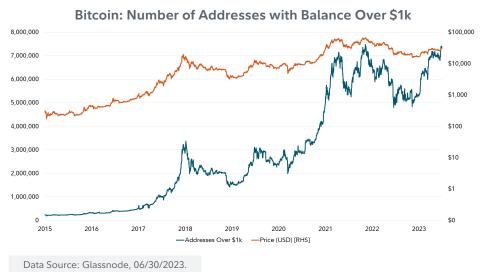
Bitcoin's illiquid supply is maintaining its current level of approximately 69%. The last all-time high was on June 28 at roughly 68.98% illiquid supply. We added another interesting metric to the chart, the "illiquid supply shock ratio," which attempts to model the probability of a supply shock. When the supply shock ratio trends higher, it indicates that the current sold supply is



primarily flowing from the liquid token supply. However, when the opposite occurs, the illiquid supply falls as long-term holders exit the market, usually in profit. Here, the illiquid supply shock ratio appears to be steadily rising. It remains unclear as to whether illiquid supply holders will start to take profit at this level or if prices will climb to incentivize selling. Either way, if the demand holds, then the likely outcome is either that the liquid supply and/or prices will increase.

Balances over \$1,000 (Bitcoin)

This metric shows how many addresses hold more than \$1,000 in bitcoin. Here, we see small addresses continuing a trend of accumulation. Since the beginning of 2023, the number of addresses with over \$1,000 in bitcoin has grown by over 39%. However, only 5% of that was during the second quarter. This metric currently sits just 2% below the all-time high created on November 11, 2021, when bitcoin's price peaked above \$67,000.

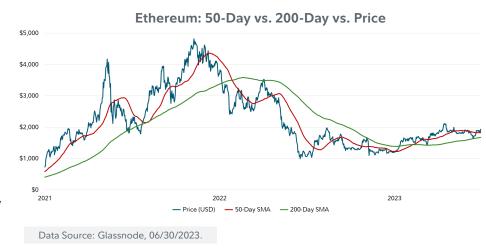




Ethereum Data to Watch

Ethereum Remains Above Key Support Levels

We can identify key support levels by charting the 50-day and 200day moving averages. A "golden cross" formed in February as prices increased, which is up roughly 11% since the pattern confirmation. Ether's price has remained relatively unchanged throughout the second quarter. However, ether retested its



200-day SMA on June 14 and is now trading back above the 50-day SMA. Whether the short-term support level will remain has yet to be determined.

Realized Price vs. Price (Ethereum)

The realized price is a metric that aims to capture the average cost basis of all current token holders. By capturing a token's last traded price, tokens that are presumed to be lost can be fairly discounted. Because these funds have not moved in so long, they are not available for purchase, and thus, are considered illiquid. Using ether's realized price as a support

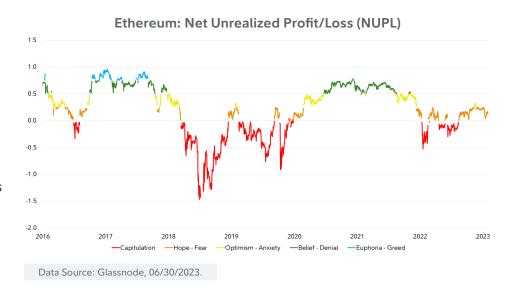


or resistance level, we see that the realized price has flipped back to a support level earlier this year. Since flipping to support on January 10, ether has not yet truly tested the new support level. Ether is trading safely above its realized price, which currently sits around \$1,500 at the time of this writing, by roughly 30%.



NUPL Ratio (Ethereum)

Historically, this metric has done well at assessing overall market sentiment. The chart to the right shows that ether has once again slipped into the "Hope–Fear" zone after briefly touching the "Optimism" zone in early May. This metric remains in a neutral zone because it has been unable to recover from the fall.



MVRV Z-Score (Ethereum)

Market Value to Realized Value (MVRV) is the ratio between the market cap and the realized cap. It gives an indication of when the trade price is above or below the "fair" value. The current score indicates that ether's market value is estimated to be just over the "fair" zone. At the time of writing, ether's realized price sits around \$1,500. Historically, this zone has preceded a bull run or at least a sideways price action. In the

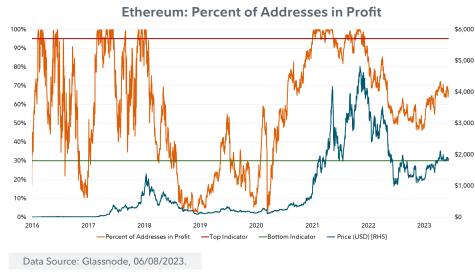


short-term, this appears to be a neutral indicator, given that ether could continue trading between \$1,200 and \$2,200, a very wide range, for a few months.



Percent in Profit (Ethereum)

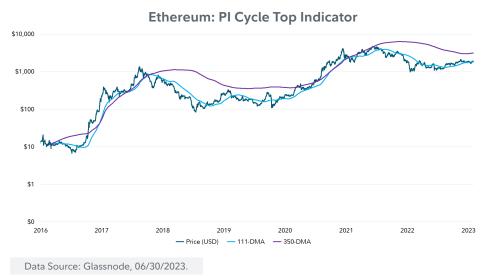
Percent in profit is the percentage of unique addresses whose funds have an average buy price lower than the current price. The "buy price" is defined as the price at the time coins were transferred to an address. Only externally owned addresses (EOAs) are counted. While this report is intended to cover Q2, there was a technical error for the June values and, as a result, the chart to the right only includes up to June 8, 2023 for



this metric. This metric has not touched the green zone since January 2020, which may be because ether is not necessarily considered a buy-and-hold asset. Ether owners may be using ether for trading, smart contracts in DeFi, staking, or buying other digital assets. Currently, nearly 66% of ether is in profit. Over April and May, the amount of Ethereum addresses in profit fell roughly 3% as the price traded between \$1,794 and \$2,100.

Pi Cycle Top Indicator (Ethereum)

The Pi Cycle indicators are composed of the 111-day moving average (111DMA) and a 2x multiple of the 350-day moving average (350DMA x 2) of ether's price. This metric shows when ether becomes significantly overheated (the shorter MA reaches the longer MA levels), which, historically, has been a good cycle top indicator. When the shorter timeframe reaches the longer

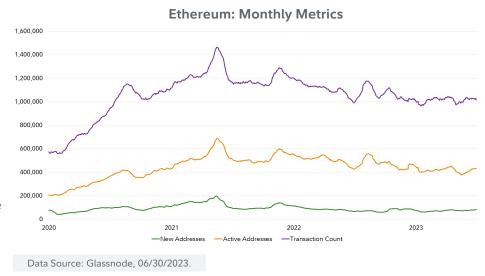


timeframe, markets are considered to be "heating up." The shorter-term average has been slowly recovering since the start of 2023. As the long-term moving average continues to follow the sunken price downward, it may be setting the stage for more volatility. Whether or not the volatility is to the upside could depend on many macro factors as well. At the time of writing, ether sits in a neutral zone.



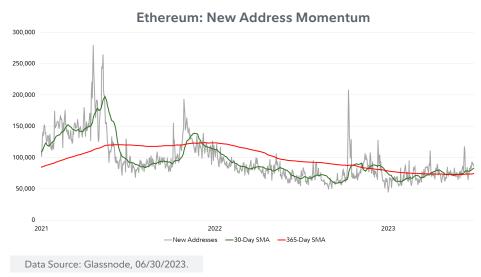
Monthly Address Metrics (Ethereum)

The number of monthly new Ethereum addresses slowly increased in Q2 2023. Monthly new addresses rose 9% this quarter, while monthly active addresses and the monthly transaction count fell 1%. The transaction count and active addresses did see a small decline earlier this year, but have since all but fully recovered.



New Address Momentum (Ethereum)

New addresses are defined as unique addresses that appeared for the first time in a transaction. New addresses appear when users create new wallets and make transactions. with them. This is different from Bitcoin addresses because Ethereum does not create a new address for each transaction. Because of this difference, this metric for momentum may not show direct network usage

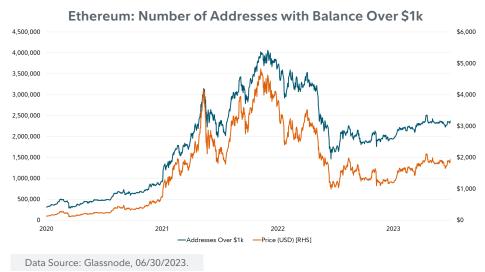


but instead could indicate a clearer picture of Ethereum adoption. Below, the short-term moving average of new addresses is shown rising back above that of the longer-term moving average. This indicates that the rate of new users joining the network is increasing. With so many capabilities available to Ethereum users, it is hard to pinpoint one exact reason why users appear to be joining the network. However, it is likely that new and existing projects are incentivizing new users and helping to drive this increase.



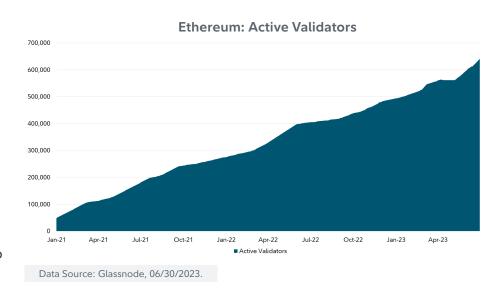
Addresses with Over \$1,000 (Ethereum)

This is the number of unique, externally owned addresses (EOAs) holding at least \$1,000 in ether. This metric changes depending on ether's price, but can be useful to show if the number of smaller ether buyers is growing. There was barely any change over the second quarter of 2023, roughly 0.17%, while the price also changed less than 0.40%.



Staking Numbers/Validators (Ethereum)

The active validator count has recovered from its previous stall in early 2023, when major institutions were unwinding their staking platforms. The number of active validators has increased roughly 29% YTD, 15% of that being in the second quarter of 2023. Validators most commonly require 32 ether to be staked on the network as proof of good will that the validator will

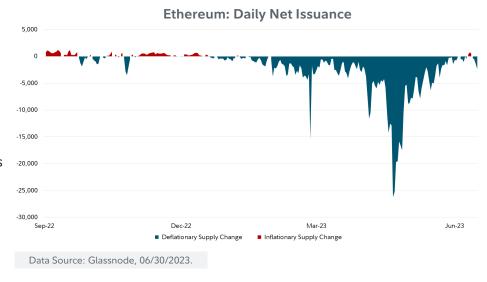


not act against the consensus. One important metric to watch since the **Shanghai upgrade** is the number of active validators. Interestingly, the maximum daily percentage change in active validators is currently around 0.3% because the entry and exit queues allow roughly 1,800 validators to enter and exit per day. This means that if all staking participants decided to unstake simultaneously, they would be required to participate in consensus until the network accepted their request. It is important to note that as validators leave the network, the individual staking reward will increase. This "incentive pendulum" aims to maintain an equilibrium between security and issuance.



Net Issuance and Burn (Ethereum)

Net issuance (new supply issued by the network minus burned supply from transactions) since The Merge in September 2022 has driven a supply decrease for over five months now. According to metrics from Glassnode, net issuance since The Merge (September 15, 2022) has surpassed -700,000 ether. This is important because, in theory, as Ethereum's supply is destroyed, it



raises the relative ownership level of all remaining token holders. Instead of having new coins consistently being issued to stakers without a burn, ultimately driving up the total supply, we see coins being burned by active users at a higher rate than the network issues in staking rewards. One may notice a small blip of inflationary days where the network managed to slip in a tiny amount of ether; 1,794.23 to be exact. However, the trend in net issuance was largely unaffected and appears likely to continue its pattern of a gradual decline in total tokens outstanding.

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