

## Cryptocurrency Markets

May Sees Modestly Monthly Prices Decline, but Volume Fall Materially — Crypto Markets Needs New Excitement

Crypto market capitalization fell in May for the first monthly decline of the year. Total cryptocurrency market cap ended at \$1.1tr down ~5% for the month. Volumes, which were stagnant in 1Q despite strong token price action, fell ~40% in April and a further 25%+ in May. We think the lack of major catalytic events and continued regulatory pressure from the SEC are weighing on investor enthusiasm and ultimately activity levels. Nonetheless, we are seeing some examples of market innovation and additional adoption of blockchain for various use-cases. This month, we highlight Bitcoin's ordinals technology, which is driving greater use of Bitcoin as a utility chain.



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- **May sees crypto token prices fall across the board.** Cryptocurrency prices ended May lower MoM following a mostly flat April. Bitcoin fell 8% in May while Ether was more resilient, down just -1%. The total cryptocurrency market capitalization ended at \$1.10tr, down over 5% from \$1.16tr at the end of April. While its price depreciated more meaningfully than the broader okaycryptocurrency market, we see Bitcoin retaining its “store of value” designation despite giving back some of the gains made following the banking crisis in March. Ethereum’s price was largely unchanged in May helped by the ‘ultra-sound-money’ which is seeing more Eth burned than issued. Interestingly, ETH balances custodied on exchange has fallen to a 5yr low post-Shapella as more are using non-custodial wallets.
- **Volumes continue to fall, a lot.** May posted another month of significant volume declines following already meaningfully lower activity in April. Volume dropped generally 25%-30% across major exchanges with Binance experiencing what appears a more meaningful decline vs. peers. We now see 2Q23TD ADV tracking ~50% lower than 1Q23 levels, with major US exchange volumes down 30%-50%. After seeing a significant increase in DEX activity in March and April as traders shifted to decentralized venues like Uniswap, we saw that migration reverse in May with Uniswap volume more inline with prior activity levels.
- **Regulation remains in focus, particularly for exchanges.** Regulatory scrutiny continues to be an overhang on cryptomarkets as the SEC continues to pursue “regulation by enforcement.” On June 5<sup>th</sup>, the SEC announced 13 charges against exchange leader Binance including accusations that it has operated as an unregistered securities exchange. Given the prominence of Binance as a crypto intermediary, both Bitcoin and Ether dropped >5% in a day contributing to Coinbase’s stock 9% price decline. In May, we saw leading crypto exchanges including Coinbase, Binance, Gemini, and Bybit exiting or hinting at exiting certain markets and products given poor regulatory clarity. We think this regulatory risk particularly in the US is pressuring token prices and activity levels seen as the industry overall underperformed this month.
- **Bitcoin ordinals gain popularity over last 4 weeks.** We see BTC Ordinals, which undergird the Bitcoin blockchain to support NFT-like inscriptions, as an overall positive for the ecosystem as it expands the utility of Bitcoin. However, the rise in activity levels and use of blockspace is exposing issues with the Bitcoin’s capacity and efficiency, which some think could threaten the longer term viability and adoption of ordinals pending new protocol upgrades. See the first section below for an introduction on ordinals.
- **Blockchain gaming wallets increased in May.** Total blockchain unique active wallets increased 9% m/m in May, rebounding from the prior month’s 11% decline. Similarly, volume saw an uptick, increasing 24% m/m and reversing April’s 34% decline. In addition to the increase in wallets and volume, a group we track of 10 popular blockchain gaming tokens increased 3% m/m, outpacing BTC/ETH which decreased 5% and marking the second straight month of outperformance. In terms of the top charts, Alien Worlds maintained its top spot, while Pixels and Iskra came in at two and three, respectively.
- **Network hashrate reaches record high for fifth consecutive month.** The average daily network hashrate was 361 EH/s in May, up 6% from April, setting a record high for the fifth consecutive month. Transaction fees, which normally make up 0.1 to 0.3 bitcoin per block mined, spiked to over 5 bitcoin per block early in the month, attributable to a surge in network volume from the adoption of ordinals protocol (more details below), which should drive modest C2Q23 earnings upside for the industry at large. Our sense is that hashrate growth could decelerate in the coming months (possibly lagging BTC price appreciation), as funding and available rack space are hard to come by. See within for details. Our full breakdown of May BTC mining activities can be found [here](#).

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## Bitcoin's Use Cases Expanding Beyond a Store of Value via Ordinals

Evidenced by our focus on Ethereum upgrades and overall use cases and technology in the Ethereum blockchain, the Bitcoin blockchain has been notoriously viewed as a clunkier and slower chain focused narrowly on transacting with BTC. A new development, known as ordinals, has grown increasingly popular in recent week with the technology allowing for the creation of Bitcoin-native digital artifacts, presenting a new NFT-like use case for Bitcoin.

### Overview of the Ordinals Technology

“Ordinals” refers to the numbered and inscribed satoshis on the Bitcoin blockchain technology. This technology was rolled out at the beginning of 2023, but has become more popular more in recent months. Note that this ordinal technology is possible given two previous Bitcoin chain upgrades— the 2017 SegWit upgrade and the 2021 Taproot upgrade.

### Ordinals are Based on Numbering Satoshis, the Atomic Unit of the Bitcoin Blockchain

Ordinals reference the satoshis (sats) that are organized according to a numbering system with unique inscriptions, and contribute to an eventual , NFT-like use case. Sats are a smaller unit of BTC on the Bitcoin blockchain; one BTC is comprised of 100mn sats. Note that sats are considered the atomic unit of the Bitcoin blockchain. Thus, while Bitcoin supply is capped at 21mn BTC, there are actually 2.1qn units available for ordinal numbering. Sats can also be traded for other cryptocurrencies and are used for smaller transactions.

Ordinal theory presents a way to inscribe extra code onto these sats and number them in the order they are minted, so each SAT has a corresponding number and thus a unique code of identification. As a result, an inscription corresponding to text or an image is connected to that unique code which is then consequently considered a piece of the larger Bitcoin chain, like an NFT, via a BRC-20 token (like Ethereum's ERC-20 tokens).

### Current Developments in Ordinals

Dune Analytics estimates that there are now over 10mn total inscriptions to date since the ordinals protocol launched in January 2023, most of which are text inscriptions (vs. other forms like images or audio). Note that were were only 3mn inscriptions following the first week of May, so we suspect that we have seen significant adoption in the past 4 weeks.

We note that the BRC-721E token standard, announced May 30, now allows Ethereum NFT holders to burn their ERC-721 tokens and inscribe them onto sats on the Bitcoin network, converting Ethereum NFTs to these new Bitcoin-proxy NFTs. We view this standard as a significant development as the new standard is essentially a bridge that connects the two largest blockchains in existence via a legitimate use case.

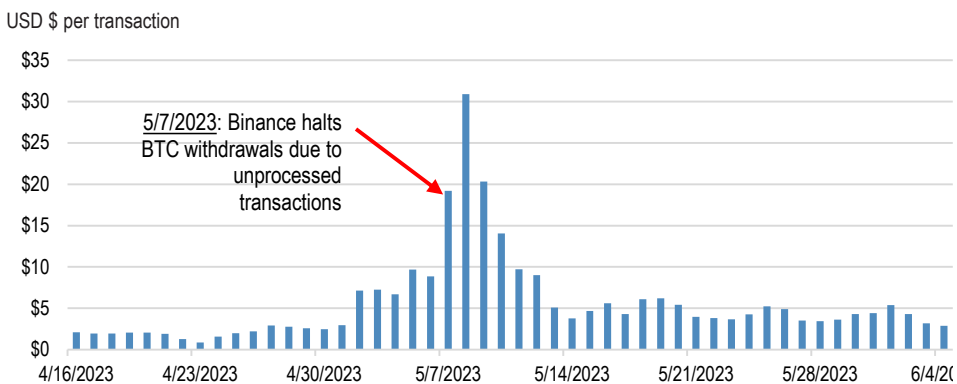
### Ordinals' Controversial Impact on Cost and Efficiency of BTC transactions

Ordinal adoption has been controversial given the increased cost and capacity required. Higher transaction costs are perpetrated by the amplified congestion caused by ordinals since there are much larger blocks of inscribed data traveling through the protocol. This were the same complaints witnessed on the Ethereum blockchain as DeFi and NFT usage took off and congestion dominated that blockchain.

**Ordinals are Increasing Costs on Bitcoin Blockchain**

As a result of the increased use of ordinals for digital inscriptions prompted by BRC-20, the cost to transact on the Bitcoin blockchain is increasing substantially. Many miners are expecting a permanent reset in the value of block space given the increased use cases presented by ordinals. Demand for block space will drive up transaction fees which historically were low single digit percentages of the overall mining reward, but miners have seen fees increase up to 75% of the reward in early May. Now, we see the fee settling at ~10-20%, still an elevated level pre-ordinal.

**Figure 1: BTC Transaction Fees Spike with Peak Protocol Congestion which Caused Binance to Suspend BTC Withdrawals**



Source: Y-charts

This increase in transaction value is one of largest concerns for this ordinal technology. The Bitcoin chain itself routinely comes under fire given its PoW protocol that requires miners to be heavily reliant on electricity usage to mine, and thus increased congestion may exacerbate the validation, and thus the energy required to process such increased quantity and size of transactions. Recall that on May 7 Binance halted all BTC withdrawals twice within 12 hours due to a backlog of unprocessed BTC transactions. Participants have now concluded that ordinals—combined with memecoin volume—are likely to blame for the increased congestion that overwhelmed the protocol and Binance’s processing of it.

**Buildout of L-2 Solutions in Search of Lower Fees**

To combat these higher transaction fees, developers are increasingly focused on Layer-2 solutions for Bitcoin. Most solutions are on Bitcoin’s Lightning Network which takes smaller transactions off the mainnet into a separate channel that then record only the result of the transaction back on the main chain. This process clears congestion and thus lowers demand for block space and subsequently lower fees. Another example is RooStock, a proxy for smart contracts via a two-way peg. We think Layer-2 will be increasingly in focus for the cryptoecosystem as developers aim to scale these chains for increased adoptions and use cases.

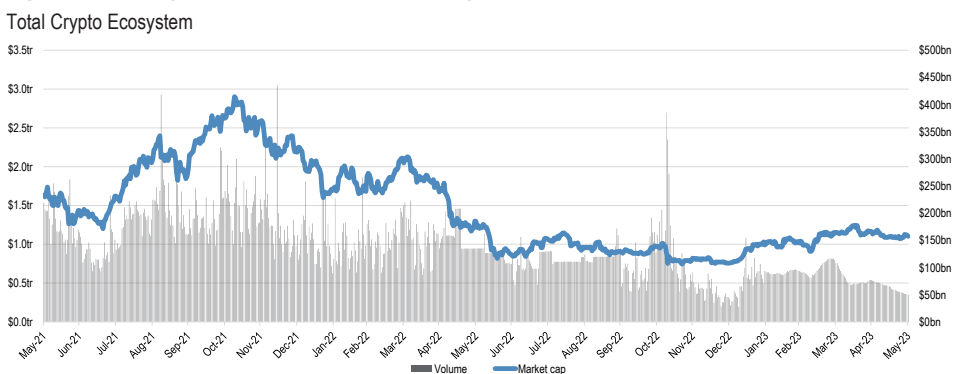
## State of Crypto Marketplace

The cryptoecosystem underperformed in May as most tokens experienced moderate price depreciation, but significant overall declines in activity levels. Although the total market cap remains above \$1tr, the ecosystem lost -5% of its value in May, with Ethereum falling -1% and Bitcoin falling 8%. The month's average total volume fell -25% from April's average, even after average volumes fell a previous ~30% in April.

### Cryptocurrency Prices / Market Cap Decline in May

The cryptocurrency market capitalization fell from \$1.16tr in April to \$1.1tr by the end of May—the first MoM decline since December 2022. Bitcoin fell ~8% in May and ended the month trading around ~\$27.1k which was significantly behind its 2023 high of \$30.5k posted just a month prior. Ethereum also declined, but still performed better than Bitcoin. Ether posted only a ~1% decline by month-end, trading around ~\$1.9k on May 31.

Figure 2: Total Crypto Market Cap Falls 5% in May as Volumes Start to Collapse



Source: Trading View

Table 1: Returns Table—Crypto Prices Mostly Decline Double-Digits in May

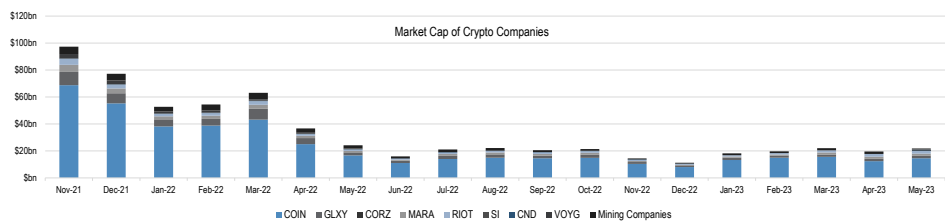
Ticker	Name	Ticker	Last Price	Returns					
				1Q23	2Q23TD	2022	2023 TD	April	May
BITW US Equity	Bitwise Top 10 Crypto Index	BITW US Equity	\$24	104%	-5%	-86%	95%	-2%	-3%
NDX Index	NASDAQ 100 STOCK INDX	NDX Index	\$14,254	21%	8%	-32%	31%	1%	8%
GOLD Index	LMBA Gold Price	GOLD Index	\$309	9%	-1%	0%	8%	0%	-1%
BTC	Bitcoin	BTC	\$27,117	72%	-8%	-64%	64%	3%	-8%
ETH	Ethereum	ETH	\$1,866	52%	-1%	-67%	56%	4%	-1%
BNB	Binance Coin	BNB	\$301	29%	-10%	-52%	23%	6%	-10%
ADA	Cardano	ADA	\$0	62%	-5%	-81%	52%	-1%	-5%
DOGE	Dogecoin	DOGE	\$0	9%	-10%	-59%	2%	4%	-10%
XRP	XRP	XRP	\$1	59%	9%	-59%	50%	-13%	9%
SOL	Solana	SOL	\$21	108%	-10%	-94%	107%	11%	-10%
DOT	Polkadot	DOT	\$5	46%	-10%	-84%	23%	-7%	-10%
XMA	Polygon	XMA	\$1	47%	-10%	-70%	17%	-12%	-10%

Source: Company reports and J.P. Morgan estimates; Note: prices reflect ending May 2023, Note that BITW considers NAV, not index price.

## Details on the Crypto Market

The cryptocurrency markets trended negatively in May as token performance and engagement worsened making it seem like investors disengaged. Contrary to the deteriorating crypto marketcap, publicly traded crypto companies' market capitalization grew +12% in May. Coinbase led the group with its market cap up +17% on positive earnings and the well-received buildout of its Bermudian derivatives exchange despite ongoing regulatory overhang. The Bitcoin miners' we track grew 4% in May with another record monthly hash rate offsetting the spike in transaction fees driven by ordinal throughput.

Figure 3: Public Crypto Companies Market Cap Recovers in May, up +12% MoM

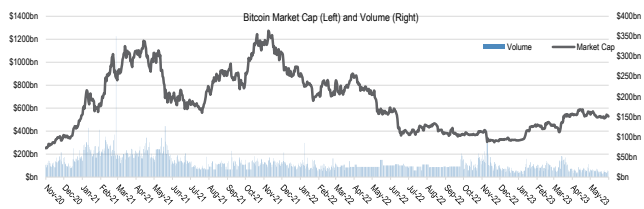


Source: Bloomberg Finance L.P.

### Bitcoin and Ether See Price Depreciation— Muted Volume Levels Persist in May

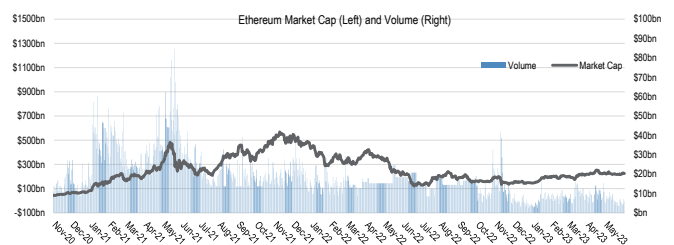
Bitcoin and Ethereum's market caps were down in May, down -8% and -1%, respectively. However, like the broader market, monthly average volumes fell significantly for both tokens. Bitcoin volumes dropped another -16% after declining ~30% in April. Ether volumes more resilient last month, but dropped -29% in May. We think this more significant drop in Ether is partially due to its higher volumes comp last month following the activity regarding Ethereum's Shanghai upgrade.

Figure 4: Bitcoin Activity Levels



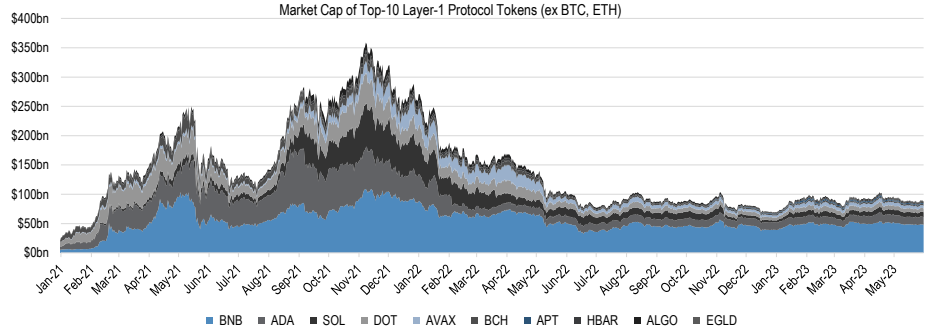
Source: Trading View

Figure 5: Ethereum Activity Levels



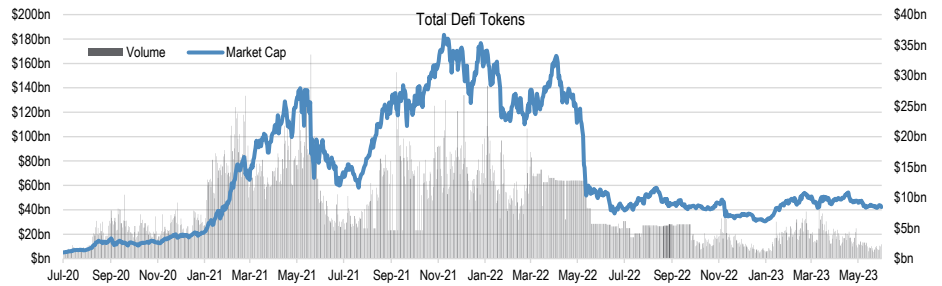
Source: Trading View

**Figure 6: Layer 1 Protocol (ex-BTC, ETH) Market Cap of Fell -8.5% in May; Ended at \$82.5bn Combined Value**



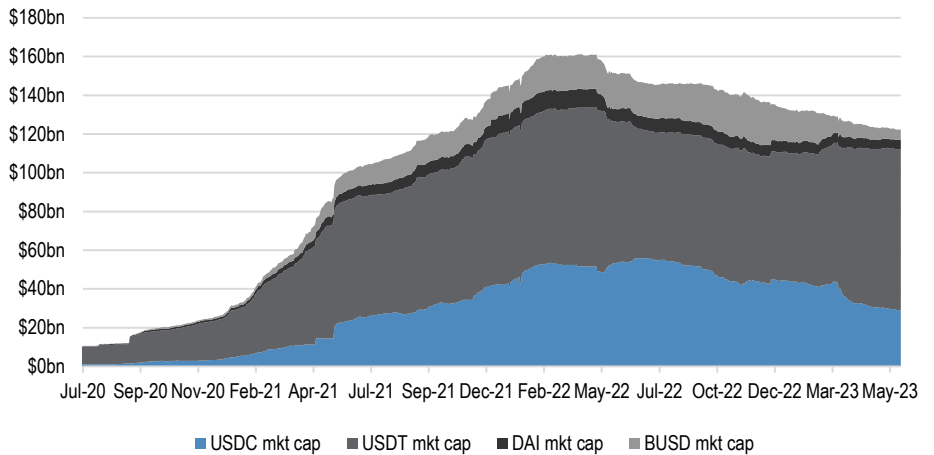
Source: Trading View

**Figure 7: Defi Market Cap Falls Another 10% from April Month-end; Average Volumes Lower Again in May**



Source: Trading View

**Figure 8: Stablecoin Market Cap Mostly Flat in May with USDC Continuing to Be a Share Donor**



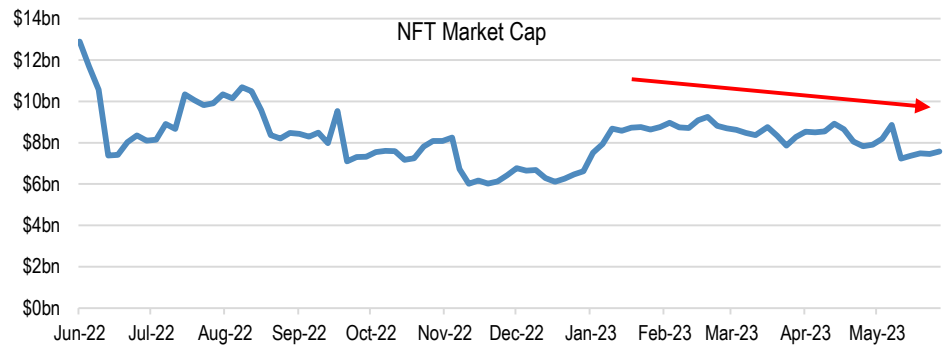
Source: Trading View

The number of NFT holders ticked up MoM to 4.5mn from 4.3mn in May. Notice this increase we saw in May reverses the shrinking number of NFT holders we have been tracking YTD, per NFT Go data; however, the number of traders continue to decline. On



average, there were ~149k traders in May, accelerating the YTD decline which recorded ~246k traders in April, ~275k in March, ~305k in February, and ~315k in January. The market cap continues to slowly trend lower 2023TD per data from nft.io after dropped most significantly following 1H22.

Figure 9: NFT Market Cap Still Trending Slightly Lower 2023TD

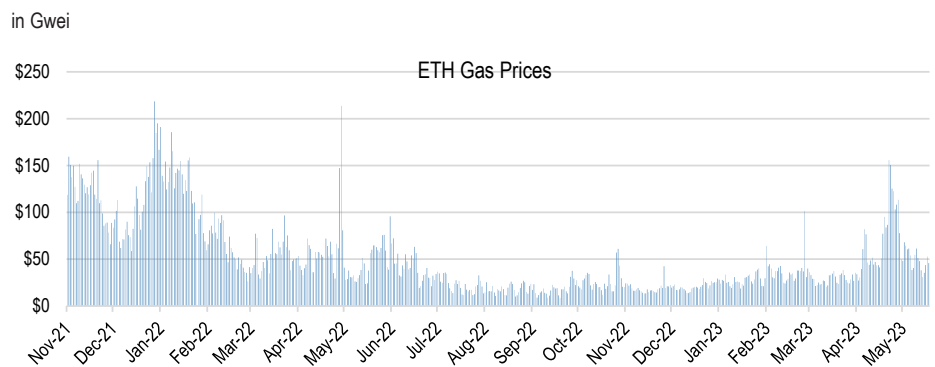


Source: nft.io as of 5/31/2023

Note this data was restated by the source vs. previous publications

The monthly average gas price spiked in May with an average of 72.5 vs. April's average of 40.0 Gwei. A month after the latest Ethereum upgrade which will eventually lower fees, we are still seeing the higher transaction fees and activity levels drive greater of Eth burn. Furthermore, we suspect the May increase was driven by meme coins like PEPE and other limited edition meme-like NFTs.

Figure 10: Average Monthly Ethereum Gas Price Spiked in May from Network Congestion Driven by Meme Coins



Source: Ycharts

## Evolution of the Cryptocurrency Markets

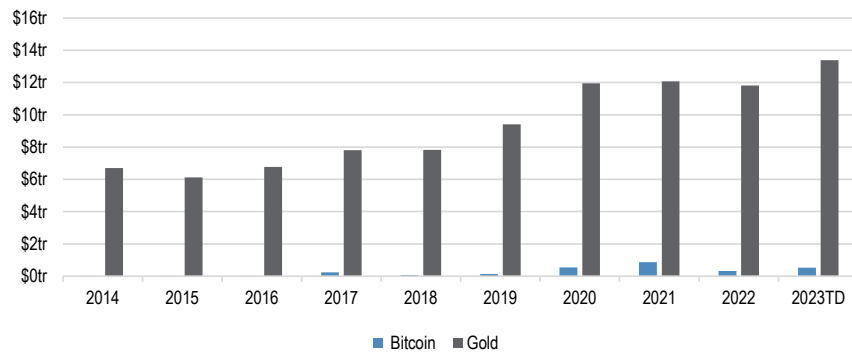
After a more resilient April, May demonstrated some softness in the cryptocurrency markets as prices, volumes, and sentiment declined. With the Ethereum Shapella Upgrade now over a month behind us, we look to the future of the cryptocurrency

markets with no new catalytic event in sight. While we see some new technological developments—like Bitcoin’s ordinals—the direction of the cryptocurrency markets proves uncertain especially given ongoing regulatory overhang. However, we continue to see this evolutionary shift of Bitcoin towards gold, increasingly mimicking the commodity as a “store of value.”

**Gold vs. Bitcoin – Bitcoin’s Case for a “Store of Value” Gains Merit in May**

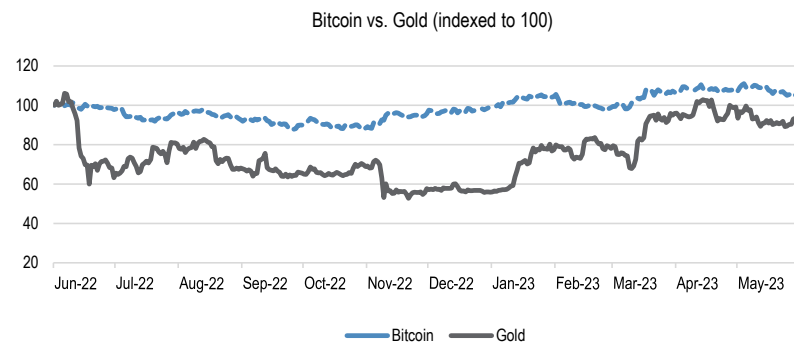
Bitcoin price ended down -8% in May from prior month-end, vs. gold down 1% according to the gold/USD spot exchange rate changes. The crypto token price continued to depreciate from its mid-April peak through the end of May. Gold, however, fell this month on another Fed Funds rate +25bps hike and consequential stronger dollar. While Bitcoin’s case for becoming a new “Store of Value” continues to show promise in May, Bitcoin volatility remains meaningfully higher than gold’s.

**Figure 11: Bitcoin v Gold Market Cap — Bitcoin Continues to Gain Ground from 2022 Sell-off, but Still Well Below Gold**



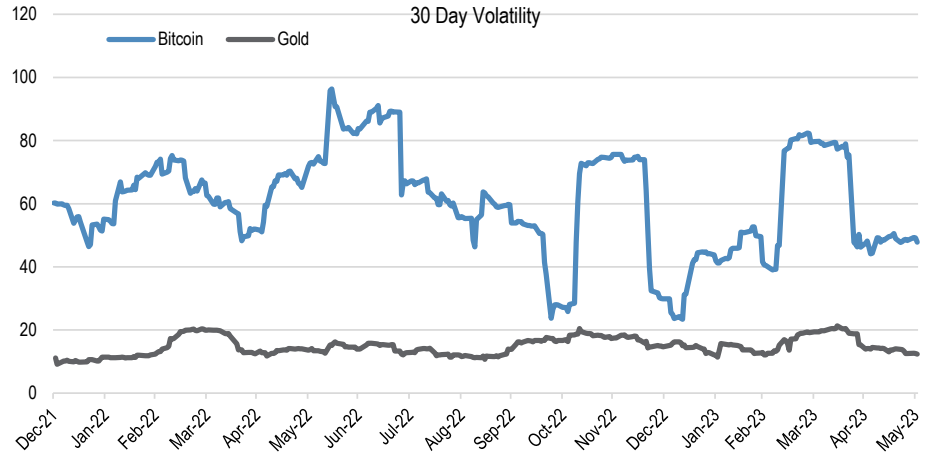
Source: Trading View, In Gold We Trust

**Figure 12: Returns of Bitcoin vs. Gold Over Past Year**



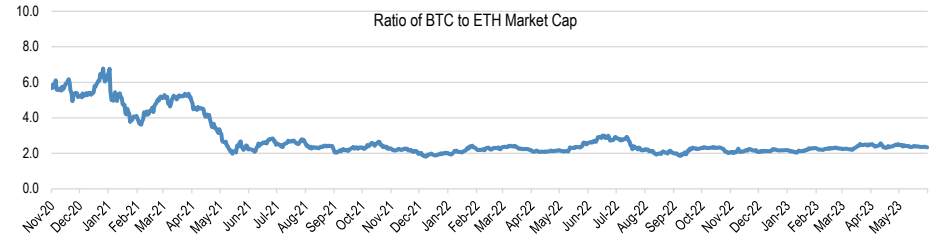
Source: Bloomberg Finance L.P.

Figure 13: 30 Day Volatility Stabilizes in May — Bitcoin vs. Gold



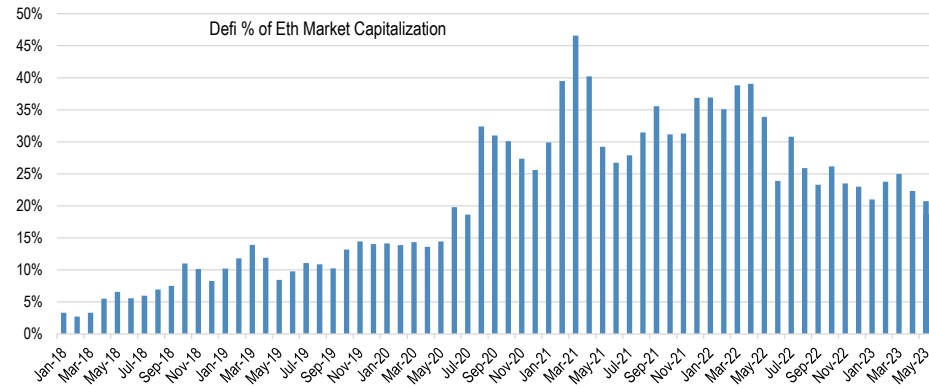
Source: Bloomberg Finance L.P.

Figure 14: Bitcoin to Ethereum Market Cap Ratio Averages 2.34 in May as Ethereum Outperforms in May



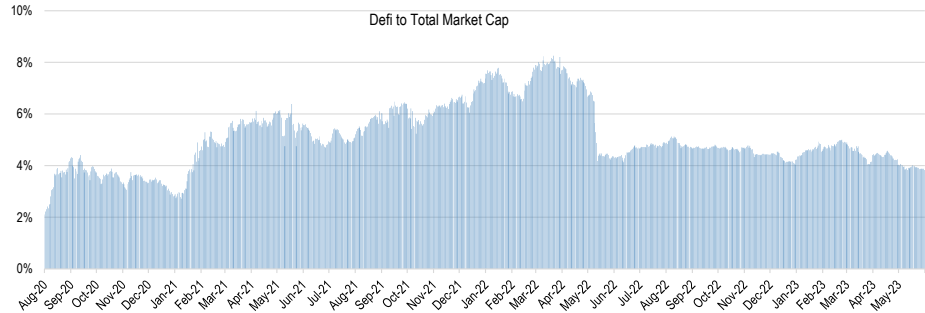
Source: Trading View

Figure 15: Defi as % of Eth Market Cap Drops to 18.7% in May— its Lowest July 2020



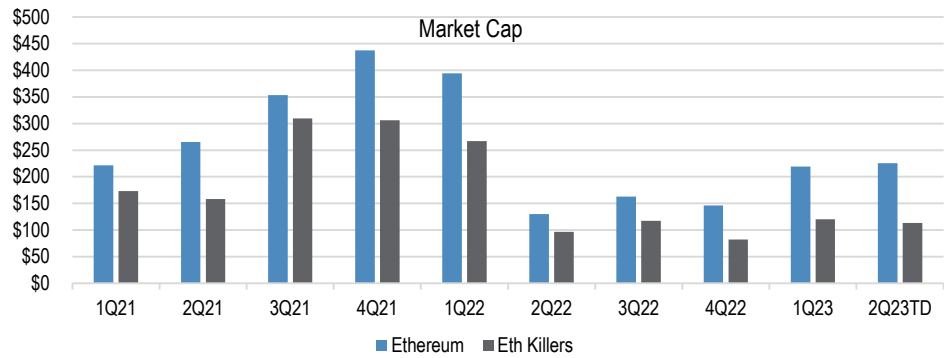
Source: Trading View; Monthly data as of 4/1/2023

**Figure 16: Defi to Total Crypto Market Cap Ratio Drops Further to ~3.85% in May**



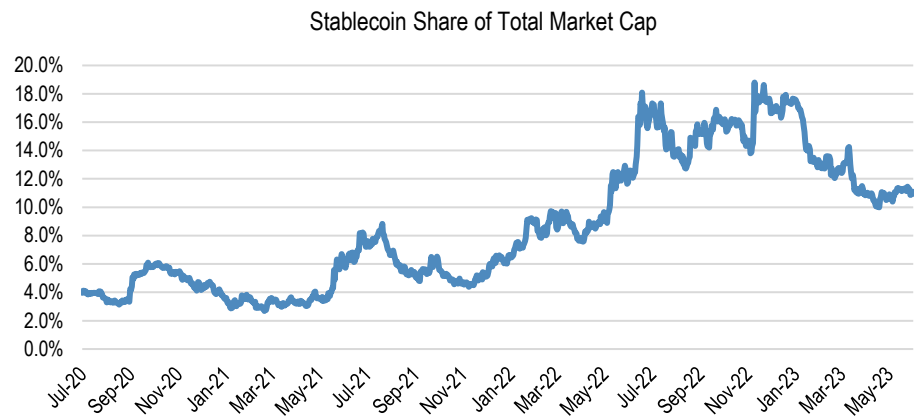
Source: Trading View

**Figure 17: Ethereum Killers – Ethereum Still Dominant Layer-1 Chain; the Gap Widens Slightly to ~\$112mn MoM in May**



Source: CryptoCompare, Coinmarketcap.com, and J.P. Morgan Estimates

**Figure 18: Stablecoin Relative Share Rises in May Amid Ecosystem Decline; Stablecoins Now Make Up ~11% of Total Crypto Cap with USDT as Largest Contributor**



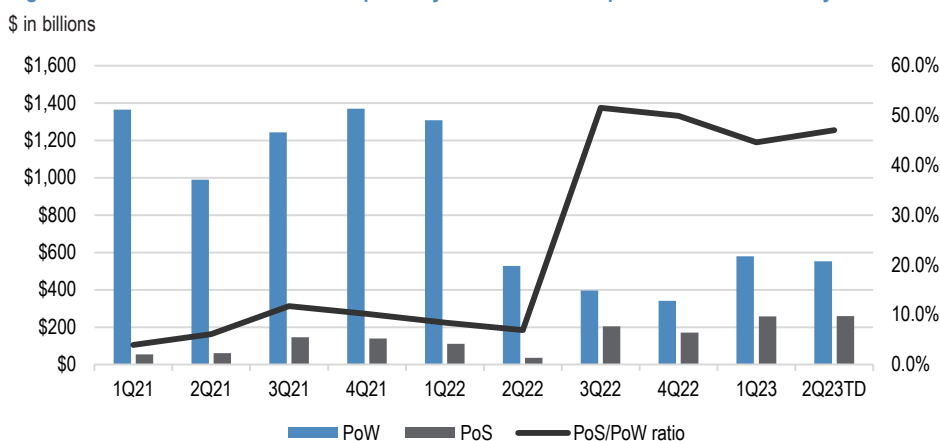
Source: Trading View, Stable Coin market cap includes USDT, USDC, DAI, BUSD, and HUSD

Table 2: Staked Crypto Trends in May — Ether Staking Participation Rises

Project	Nominal Yield %	Nominal Yield % (Prior)	Staked %	Staked % (Prior)	Inflation %	Real Yield %	Lock-Up
ETH2.0	6.7%	5.4%	15.8%	14.9%	0.6%	6.1%	~12 days
Cardano	3.3%	3.3%	49.5%	51.8%	1.6%	1.7%	No Lock-Up
Solana	7.3%	7.3%	71.5%	72.0%	5.3%	2.0%	2 days
Polkadot	15.8%	15.2%	43.1%	48.5%	6.8%	9.0%	28 days
Cosmos	23.3%	23.3%	60.4%	60.4%	15.6%	7.7%	21 days
Polygon	4.7%	4.7%	36.9%	36.9%	1.8%	2.9%	2-3 days
Elrond	7.9%	7.9%	63.6%	63.4%	5.0%	2.9%	-
Near	9.5%	9.4%	52.3%	52.7%	5.0%	4.5%	36 hours
Mina	22.0%	22.0%	88.9%	88.9%	19.6%	2.4%	No Lock-Up
Kusama	9.4%	10.4%	53.0%	51.9%	5.0%	4.4%	8 days

Source: Staked.us

Figure 19: Ratios of PoS/PoW Ticks Up in May as Ethereum Outperforms Bitcoin in May



Source: Coinmarketcap.com, Trading View, and J.P. Morgan Estimates

## Significant Decline in Token and Exchange Volumes Continues in May

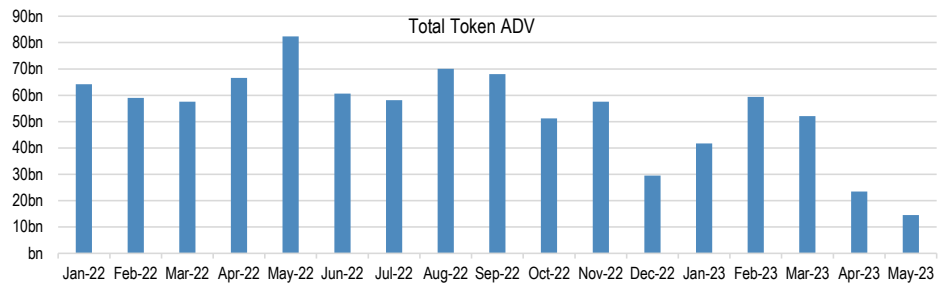
Crypto trading activity dropped substantially again in May across single tokens and at the overall spot exchanges level. Total ADV across top tokens we track was 14.5mn in May—down 38% from April’s ADV of 23.4mn, according to CryptoCompare data. Top CEX and DeFi volumes were down a similar 29% from April. Looking at just top exchanges, we saw volumes down 15%-30% in May vs. April levels. Coinbase continued to pick up share in May, although volume was down about 25% in the month.

While we saw a significant increase in DEX volumes from UniSwap v3 in March and April, we think that transition normalized in May. Uniswap v2 total volumes are tracking -24% lower than April while Uniswap v3 total volume are down substantially more. Individual token ADV also remained depressed in May, with most major tokens

we track double digit percentages lower from April ADV. 2Q23TD token volumes are tracking well below 1Q23 numbers as well as annual comps in 2Q23.

Figure 20: Trading Volumes at Key Exchanges Fall Again in May After Stronger 1Q23

Average Daily Volumes of the Top Exchanges— \$ in billions



Source: CryptoCompare

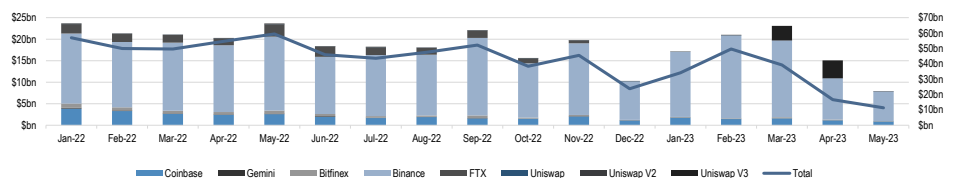
Figure 21: Token Volume—2Q23TD Trading Volumes Substantially Lower After Sequential Lift in 1Q23

ADV	4Q22	1Q23	2Q23TD	2Q23TD YoY	April	May
As of 2023-05-31						
Bitcoin	17,710,204,631	19,881,074,112	5,514,069,712	-74%	6,423,797,053	4,633,688,415
Ethereum	7,613,464,352	6,522,465,815	2,717,640,577	-73%	3,398,040,865	2,059,188,686
Tether	16,402,214,379	19,296,800,954	8,545,108,788	-75%	10,924,413,912	6,242,555,443
Binance Coin	491,447,399	342,400,263	195,894,281	-85%	252,072,213	141,528,540
Cardano	228,629,989	441,492,294	124,099,569	-82%	182,623,717	67,463,296
Dogecoin	654,447,919	345,179,903	301,462,722	-60%	513,618,417	96,150,760
USD Coin	1,447,639,192	1,585,986,072	747,793,851	-58%	786,079,308	710,743,410
XRP	680,546,844	1,019,622,202	415,429,264	-67%	505,834,591	327,940,238
Solana	449,012,518	542,946,888	209,744,811	-84%	275,899,306	145,724,332
Polkadot	136,492,306	584,021,603	50,381,454	-93%	73,554,014	27,956,397
Shiba Inu	159,785,193	219,439,509	74,820,161	-86%	108,347,856	42,374,003
<b>Total</b>	<b>45,973,884,721</b>	<b>50,781,429,616</b>	<b>18,896,445,191</b>	<b>-75%</b>	<b>23,444,281,251</b>	<b>14,495,313,519</b>

Source: CryptoCompare

Figure 22: Crypto Exchanges – DeFi Volumes Normalize in May After March and April Influx

\$ in millions



Source: CryptoCompare

Figure 23: Exchange Volumes – Exchange Volumes Fall Again in May– Coinbase Mkt Share Ticks Up to 7.6%

	3Q22	4Q22	1Q23	2Q23TD	1Q23 YoY	2Q23TD YoY	MoM	April	May	Last Week
Coinbase	1,716,879,648	1,568,134,094	1,598,515,363	1,010,693,126	-51%	-95%	-25%	1,158,576,362	866,399,672	790,116,988
Gemini	84,257,740	43,846,411	30,137,359	23,148,888	-80%	-82%	-14%	24,914,712	21,440,026	18,108,818
Bittrex	425,801,986	192,819,950	170,894,496	105,678,117	-78%	-82%	-43%	134,981,218	77,320,277	66,001,548
Binance	15,408,391,287	12,698,812,789	17,347,431,711	8,193,461,264	10%	-47%	-28%	9,576,991,346	6,854,561,164	6,649,396,653
FTX	1,715,550,834	619,193,928	-	17,774	-100%	-100%	-	21,988	13,686	12,180
Uniswap	48,140	29,582	26,017	17,774	-55%	-73%	-38%	21,988	13,686	12,180
Uniswap V2	42,030,044	34,707,518	37,250,216	24,863,678	-71%	-73%	-27%	28,736,666	21,115,628	-
Uniswap V3	21,913,006	29,121,362	1,183,845,347	2,051,132,776	NM	NM	NM	4,123,103,113	46,000,191	35,073,481
<b>Total</b>	<b>19,414,872,586</b>	<b>15,176,665,654</b>	<b>20,368,099,418</b>	<b>11,408,395,622</b>	<b>-9%</b>	<b>-45%</b>	<b>-48%</b>	<b>15,947,325,465</b>	<b>7,886,850,671</b>	<b>7,558,709,668</b>

Source: CryptoCompare

06 June 2023

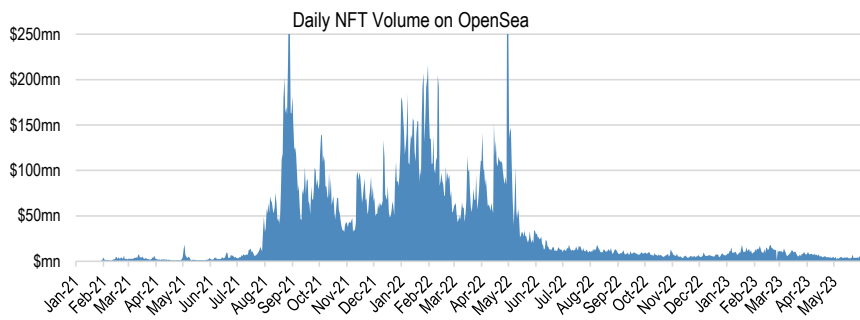
**Figure 24: OpenSea Smart Contract Average Daily Volume Down Further in May Leading 2Q23TD Metrics to Track Lower than 2H22**

As of 2023-05-31	3Q22	4Q22	1Q23	2Q23	MTD	Last Week	Apr	May
Average Users	25,964	20,119	20,742	12,070	12,794	11,631	11,322	12,794
Average Volume	11,307,708	6,530,133	10,748,933	5,076,877	3,996,758	4,232,089	6,193,000	3,996,758
Average Transaction	56,841	42,239	43,635	24,656	29,908	33,285	19,228	29,908

Source: Dapp Radar and J.P. Morgan estimates

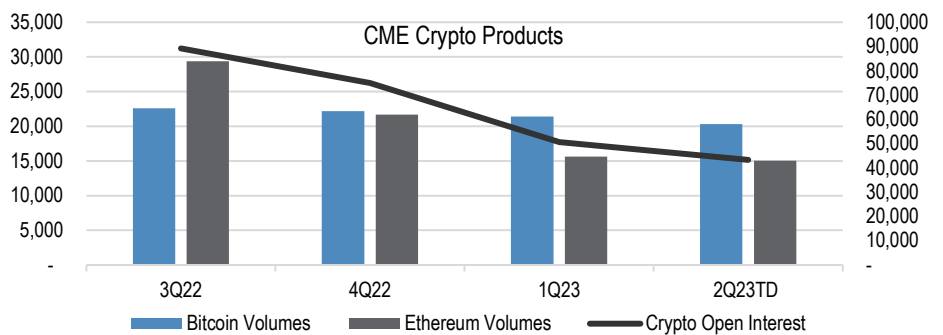
**Figure 25: Overall NFT Daily Volume Remains Depressed Compared to Historic Levels; May Avg Transaction Volumes Down 35% vs. April**

\$ in millions



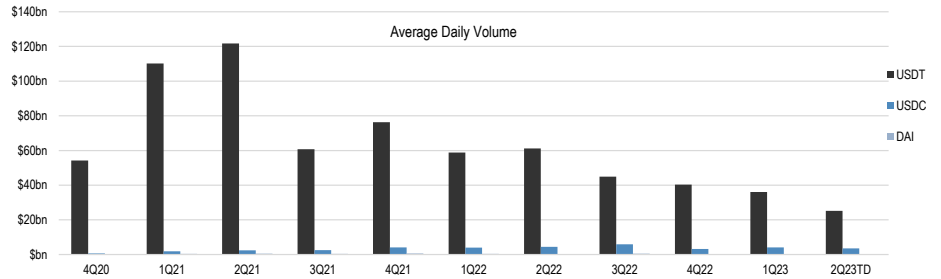
Source: DappRadar and J.P. Morgan estimates

**Figure 26: CME Derivative Volumes Rise in April— BTC Futures Activity Gains More Ground vs. ETH Activity 2Q23TD**



Source: Company reports, CME, and J.P. Morgan estimates

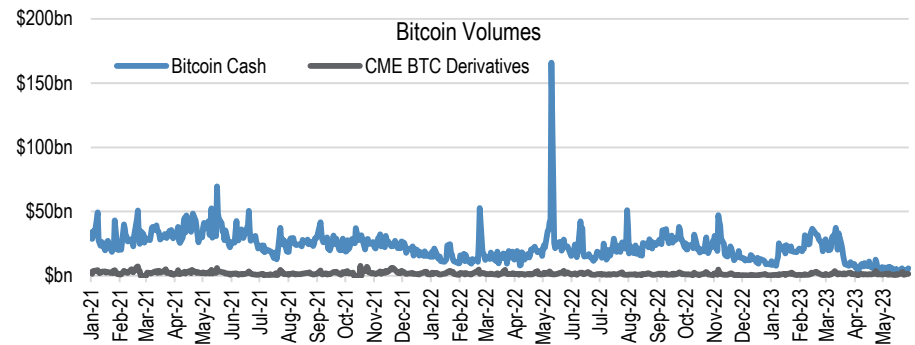
**Figure 27: Stable Coin Volumes Continue to Be Dominated by USDT (Tether), but Volumes are Declining Meaningfully 2Q23TD (down ~30%)**



Source: Trading View

**Figure 28: Bitcoin Volumes: Cash vs Derivatives – Cash Volumes Flat MoM in May**

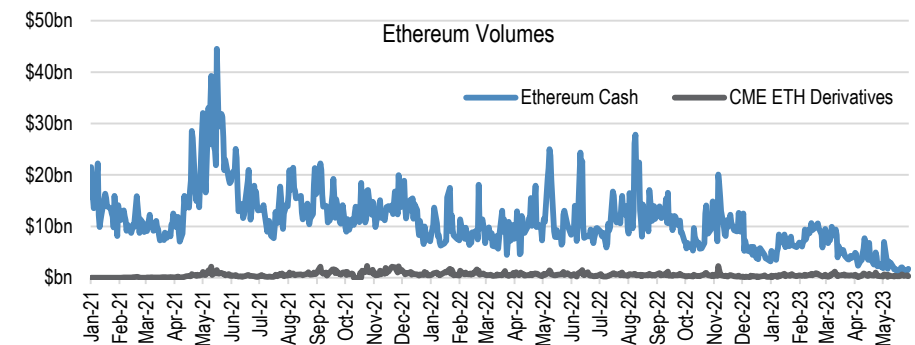
ADV in \$ billions



Source: CME, CryptoCompare, J.P. Morgan estimates

**Figure 29: Ethereum Volumes: Cash vs. Derivatives Continues Trending Lower in May**

ADV in \$ billions



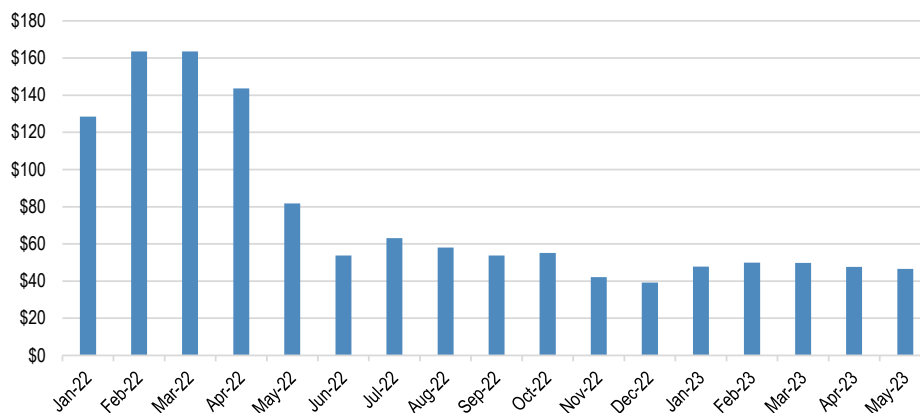
Source: CME, CryptoCompare, J.P. Morgan estimates



## Growth Metrics of the Crypto Markets

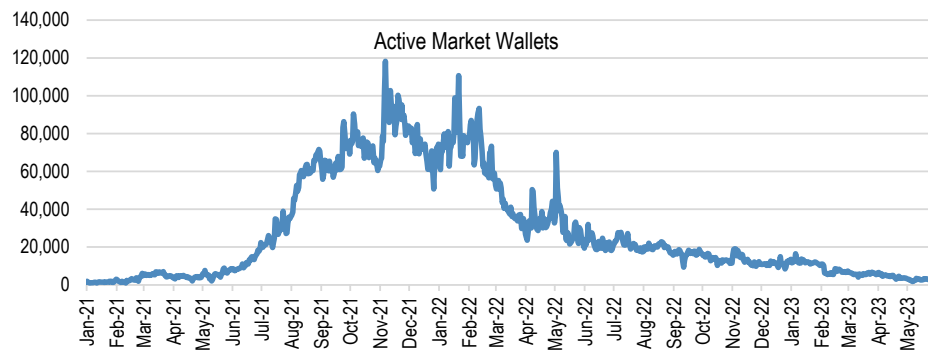
A key focus of ours remains the growth of crypto markets and the crypto ecosystem. With the Ethereum Shapella Upgrade now over a month behind us, we look to the future of the cryptocurrency markets with no new catalytic event in sight in the coming months. We are seeing a more muted and underperforming cryptoecosystem because of that. NFT adoption and trading has slowed dramatically, and the number of active markets continues to decline MoM. We think ordinals and Bitcoin NFTs may breathe some life into the NFT market overall, regardless of the protocol. Downloads and users of crypto-related apps are also slowing 2Q23TD signaling decreased engagement.

Figure 30: Total Value Locked in Defi Resilient in May



Source: DeFi Llama

Figure 31: Average Number of Active Market Wallets Down -33% from April Average



Source: Nonfungible.com

Figure 32: Wallet Data—New Addresses Decline MoM in May for Both Bitcoin and Ethereum

	average daily	3Q22	4Q22	1Q23	2Q23TD	1Q23 YoY	2Q23TD YoY	Apr	May
Bitcoin	New Addresses	389,816	424,150	455,705	428,568	10%	4%	452,873	405,047
	Active Addresses	893,215	922,635	953,784	904,667	3%	-4%	971,720	839,777
	Transaction Count	248,174	258,753	299,142	443,077	19%	70%	357,587	525,810
Ethereum	New Addresses	73,267	129,582	90,948	105,340	-11%	18%	124,616	86,686
	Active Addresses	542,801	546,751	510,582	479,267	-15%	-13%	505,107	454,261
	Transaction Count	1,105,676	1,026,277	1,022,511	1,005,263	-10%	-7%	973,126	1,036,363

Source: CryptoCompare and J.P. Morgan estimates

Figure 33: May Engagement Levels Tracking In-Line with 2Q23TD; Mostly Below 1Q23

	DAUs	1Q23	2Q23TD	4 week avg	MAUs	1Q23	2Q23TD	4 week avg
Crypto	Binance.US	70,806	78,909	78,461	Binance.US	264,831	285,012	284,074
	Bitfinex	6,595	2,187	2,057	Bitfinex	33,189	12,372	12,256
	Bitstamp	1,334	1,203	1,111	Bitstamp	9,029	7,425	6,848
	Coinbase	919,899	787,820	745,647	Coinbase	2,241,638	1,809,884	1,738,666
	eToro	242,995	237,804	233,915	eToro	654,482	615,695	611,569
	Gemini	23,034	13,616	12,882	Gemini	130,534	68,175	65,067
Traditional	IBKR	86,674	71,594	69,414	IBKR	237,465	181,130	176,389
	Robinhood	599,101	587,595	572,562	Robinhood	1,367,964	1,358,203	1,332,799
	Schwab	151,000	416,611	626,621	Schwab	299,765	687,029	975,023

Source: Apptopia and J.P. Morgan estimates; Note: 4-week average represents data through May 31, 2023

Figure 34: Investment Inflows Increase in May

	AUM	Flows					
		3Q22	4Q22	1Q23	2Q23TD	April	May
<b>ETF</b>							
Direct	\$1,373.4	\$21.0	\$3.7	-\$10.3	\$25.0	-\$0.2	\$3.8
Indirect	\$853.8	-\$43.5	-\$55.0	-\$73.6	-\$9.8	\$0.2	-\$12.5
<b>Trusts</b>	\$23,097.2	\$508.6	\$3,299.9	-\$3,915.9	\$1,893.3	\$313.8	\$1,094.7
<b>Funds</b>	\$43.6	\$3.7	\$1.1	\$9.7	\$3.4	\$3.0	-\$1.0
<b>Hedge Fund</b>	\$0.0	-\$2.9	\$2.1	\$12.2	\$0.0	\$2.2	\$0.0
<b>Total</b>	<b>\$25,368.0</b>	<b>\$487.0</b>	<b>\$3,251.9</b>	<b>-\$3,977.8</b>	<b>\$1,912.0</b>	<b>\$319.1</b>	<b>\$1,085.1</b>

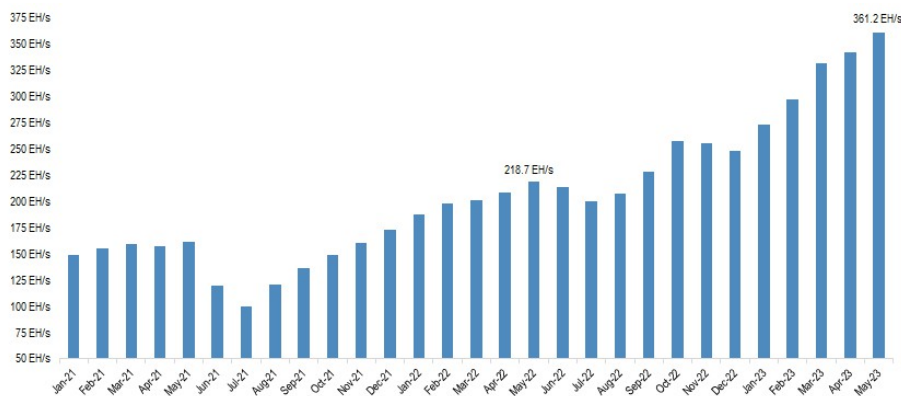
Source: Bloomberg Finance L.P. and J.P. Morgan estimates

## Mining—An Update on the Bitcoin Miners

Monthly average bitcoin price declined in May, while the network hashrate rose to record highs for the fifth consecutive month. The seven-day rolling average network hashrate stood at 375 EH/s as of May 31st, up 13% from April 30th. Our sense is that network hashrate growth could slow over the coming months (possibly lagging BTC price appreciation) as funding and available rack space is hard to come by.

Figure 35, below, shows the average daily network hashrate by month, as estimated by Nasdaq Data Link. The average daily network hash rate was 361.2 EH/s in May, up 6% from the prior month figure.

Figure 35: Monthly Average Network Hashrate

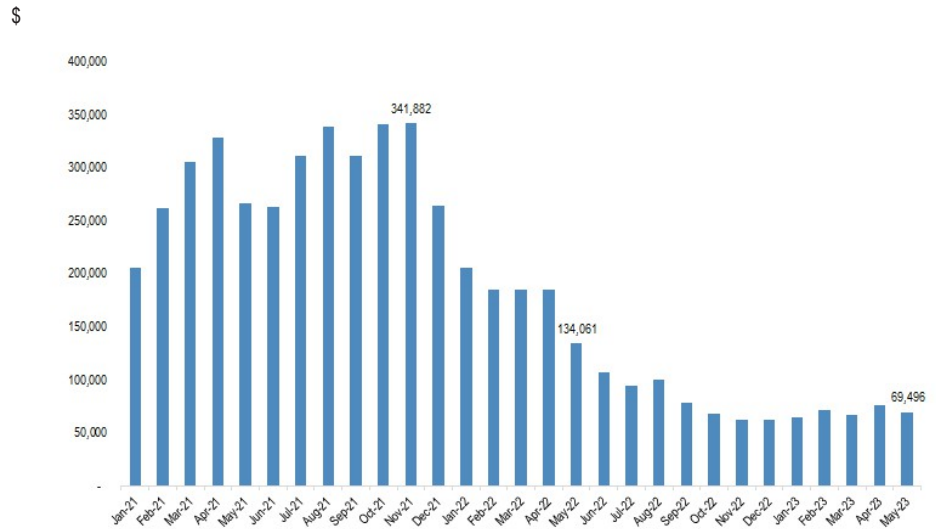


Source: Nasdaq Data Link, J.P. Morgan Calculations

### Daily Block Reward Revenue per Exahash of Mining Capacity

Figure 36, below, plots the average daily bitcoin block reward revenue per exahash of mining capacity over time, a miner profitability proxy that incorporates the current block reward (6.25 BTC per block), the average block time (10 minutes), bitcoin price, and the network hashrate. In May, we estimate one exahash of mining capacity generated approximately \$69,500 in daily block reward revenue (ignoring transaction fees), down 8% from the prior month, as bitcoin prices lagged the increase in the network hashrate in the month.

Figure 36: Average Daily Block Reward per EH/s (by Month)



Source: Bloomberg Finance L.P., Nasdaq Data Link, J.P. Morgan calculations

**Annualized Block Reward Revenue Opportunity**

Figure 37, below, shows the annualized bitcoin block reward revenue opportunity over time, calculated by multiplying bitcoin’s trailing seven-day moving average by 328,500, the number of bitcoin mined/created per year based on the block reward schedule. This is a measure of industry-wide revenue potential and, in theory, should inform stock prices. Based on bitcoin’s seven-day moving average as of May 31st (~\$27,000), we size the annualized block reward revenue opportunity at \$8.9bn, down 6% from \$9.4bn as of the prior month’s end.

Figure 37: Annualized Block Reward Revenue Opportunity

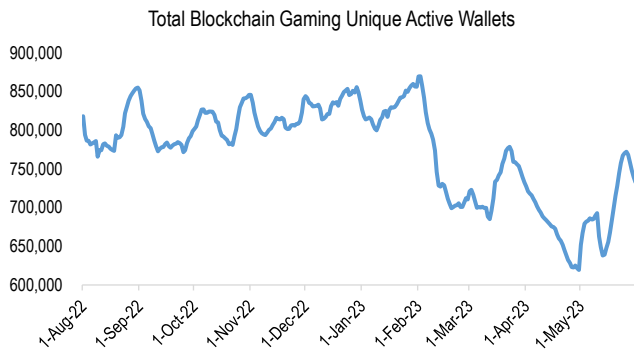


Source: Bloomberg Finance L.P., Nasdaq Data Link, J.P. Morgan calculations

## Crypto-Gaming Companies

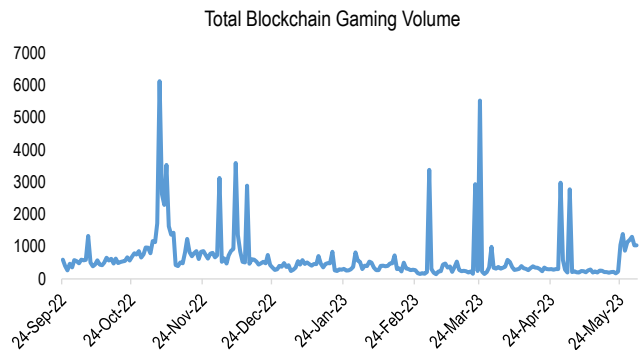
Gaming is emerging as a key use-case for blockchain and has the potential to accelerate consumer adoption and know-how for the technology. The dynamic is not dissimilar to the early 2010s, when mobile games, first made popular on social media platforms, migrated to iOS and Android, driving users to create mobile wallets and learn game mechanics later adopted by a wider set of applications. Then – as with now – innovation was led by industry outsiders, as opposed to the leading console/PC publishers which later entered the space mainly through acquisition. In 2021, companies raised ~\$4b for blockchain games and Metaverse experiences.

**Figure 38: Total Blockchain Gaming Unique Active Wallets Increased 9% M/M**



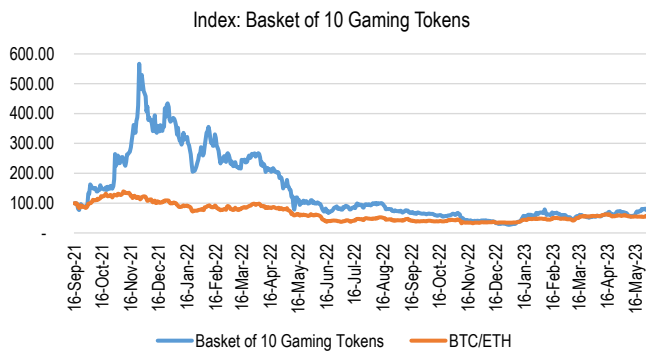
Source: DappRadar

**Figure 39: Total Blockchain Gaming Volume Increased 24% M/M, Reversing April's 34% Decline**



Source: DappRadar

**Figure 40: Basket of Gaming Tokens Increased 3% M/M, Outpacing BTC/ETH Down 5% and Marking Second Straight Month of Outperformance**



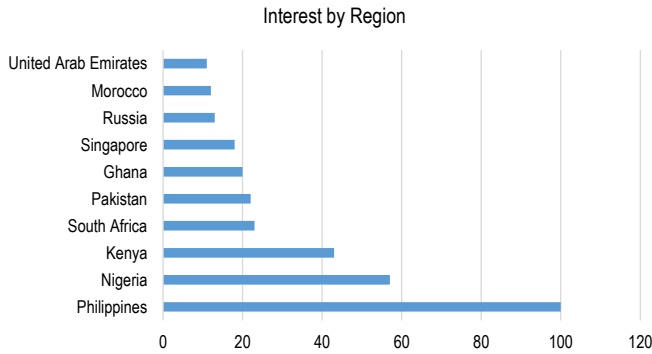
Source: CoinMarketCap

**Figure 41: Market Cap Basket of 10 Gaming Tokens Decreased 9% M/M**



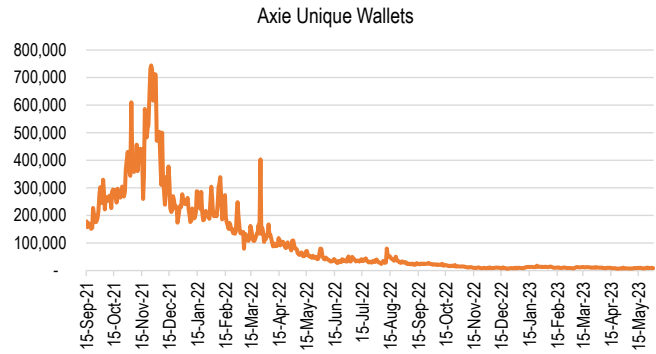
Source: CoinMarketCap

Figure 42: Interest Remains Highest in Developing World Countries



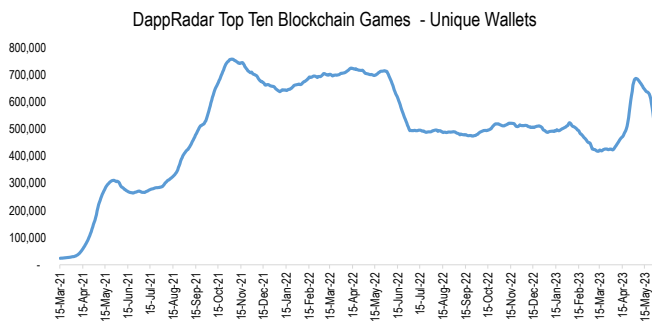
Source: Google Trends

Figure 43: Average Axie Wallets Decreased 1% M/M



Source: CoinMarketCap, DappRadar

Figure 44: DappRadar Top Ten Blockchain Game Unique Active Wallets Were Down 34% M/M



Source: DappRadar

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