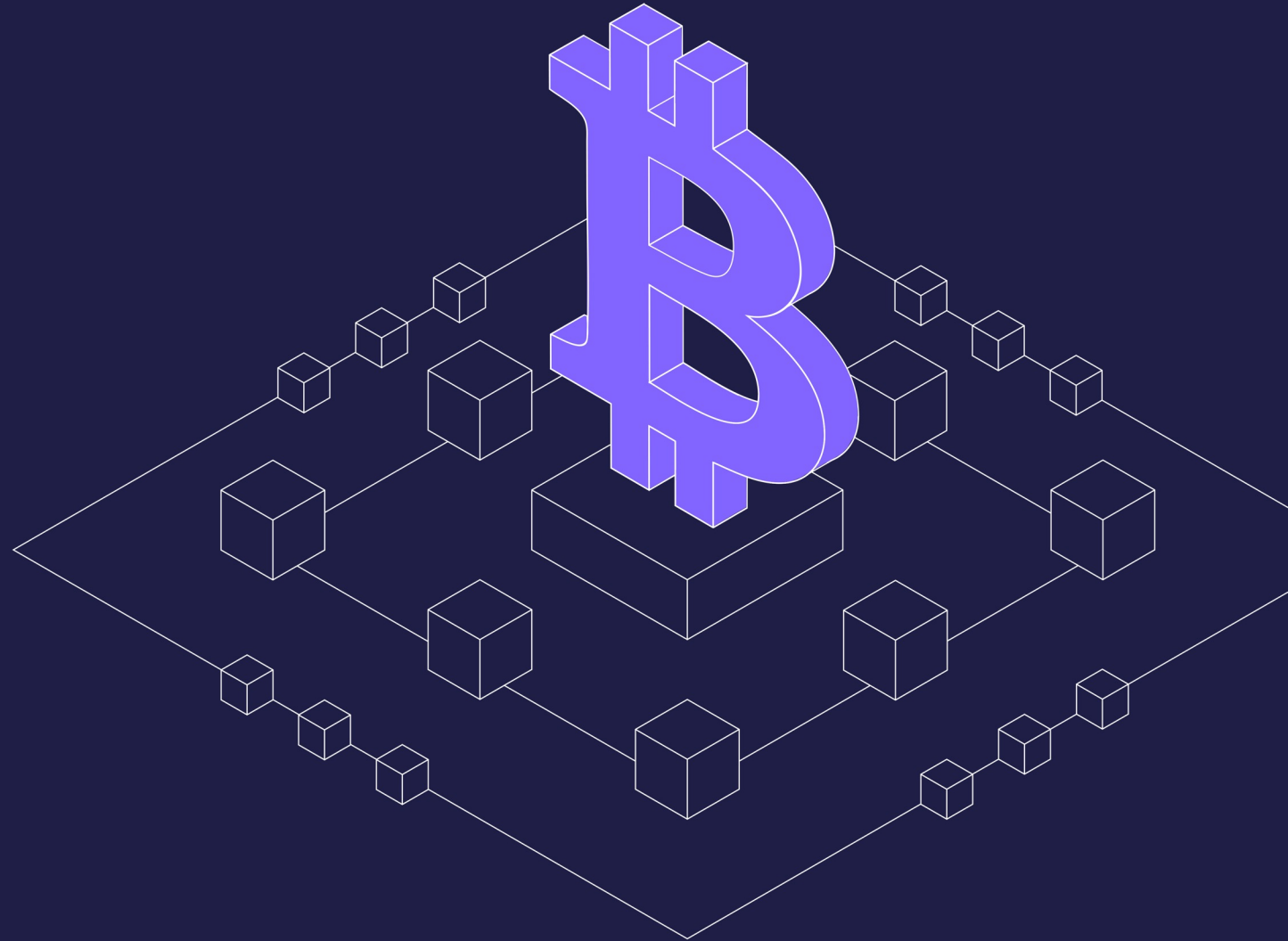




As of December 31, 2022

THE BITCOIN MONTHLY

AT THE DAWN OF 2023



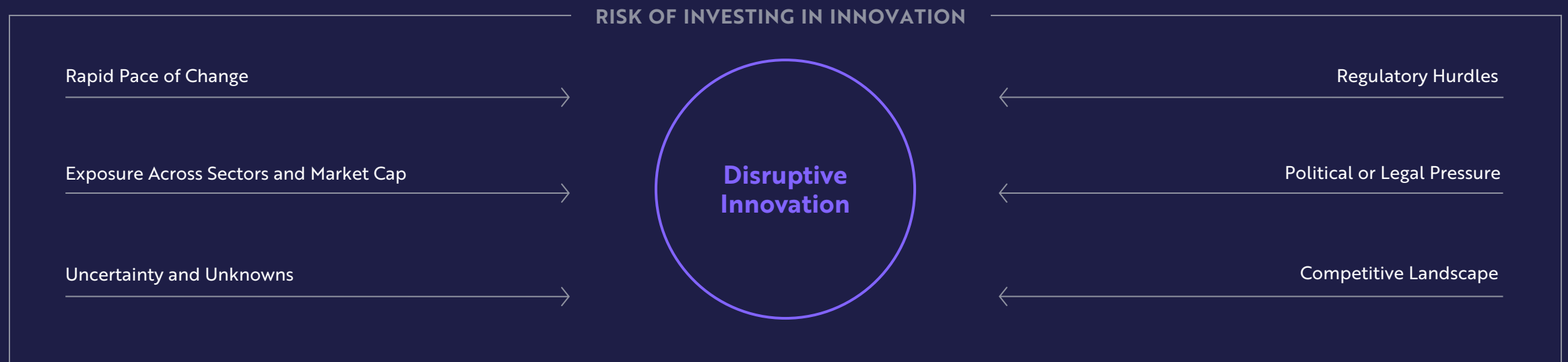
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RISKS OF INVESTING IN INNOVATION

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Please read risk disclosure carefully.



→ **Aim for a cross-sector understanding of technology and combine top-down and bottom-up research.**

→ **Aim to understand the regulatory, market, sector, and company risks. (See Risk and Disclosure Page)**



SECTIONS

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Appendix: Glossary Of Terms



Section 01

Market Summary





A Calm December Could Signal New Dynamics In Q1 2023

The State Of Bitcoin

- Bitcoin still shows a robust cohort of long-term holders, as the percentage of supply last moved in 2+ years nears all-time highs (47%).
- After FTX's collapse, the \$16k-\$17.5k price range saw the second highest record of bitcoins traded in the network's history (7% of bitcoin's outstanding supply), potentially signaling important range of support.
- As bitcoin's price volatility has decreased to levels not seen since late 2020, the network's inner activity is muted as address growth has subsided.

The State Of The Industry

- All eyes are on the Digital Currency Group (DCG) and its subsidiaries Genesis and Grayscale as Cameron Winklevoss published an open letter to its Co-Founder and CEO Barry Silbert alleging an outstanding loan from DCG to Genesis of \$1.675 billion.
- After the fall of FTX, Coinbase has increased market share significantly among spot, fiat-based crypto exchanges.
- Miner outflows, a proxy for selling behavior, have decreased 44% during December, potentially indicating that weaker natural sellers have been exhausted.

ARK'S KEY TAKEAWAY

- Bitcoin dropped 3.7% in December and was still trading below its investor cost basis (\$17,440), having closed the month at \$16,550.
- The Bitcoin network is pointing to strong holding behavior by long-term participants, painful losses for shorter-term speculators, and underwhelming network activity.
- DCG is the biggest question mark in the crypto industry after the publication of Cameron Winklevoss' open letter to Barry Silbert.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#) unless otherwise specified. Data valid as of December 31, 2022, and subject to change. For more information on certain terms, please read our Appendix: Glossary Of Terms on page 20 of this report. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



News Of The Month

<u>DOJ Watchdog Seeks Independent Review Of FTX Bankruptcy</u>	<u>Binance Proof-of-Reserves Auditor Mazars Pauses All Work For Crypto Clients</u>
<u>Three Arrows Capital Liquidators Begin Taking Control Of Failed Hedge Fund's Assets</u>	<u>Sam Bankman-Fried To Reverse Decision On Contesting Extradition</u>
<u>Genesis Creditor Groups' Loans Amount To \$1.8B And Counting</u>	<u>Grayscale Will Explore Returning Portion Of Investor Capital If SEC Refuses Spot Bitcoin ETF</u>
<u>LedgerX For Sale, With Interest From Blockchain.com, Gemini, Others</u>	<u>Voyager Announces Agreement For Binance.US To Acquire Its Assets</u>
<u>Hedge Fund Sues Grayscale For Data On Battered Bitcoin Trust</u>	<u>BlockFi Seeks To Reopen Withdrawals For Certain Users</u>
<u>Binance's Bitcoin Reserves Are Collateralized 101% According To Mazars Report</u>	<u>Sam Bankman-Fried Is Set for Extradition to US</u>
<u>Celsius Must Return \$44 Million In Crypto To Users, Judge Orders</u>	<u>Genesis And DCG Creditor Committee Propose Plan For Asset Recovery</u>
<u>SEC Wants Firms To Disclose If They Have Crypto Exposure</u>	<u>Bankman-Fried In FBI Custody, Ellison, Wang Plead Guilty And Are Cooperating</u>
<u>Crypto.com Releases Proof Of Reserves</u>	<u>FTX Founder Sam Bankman-Fried To Be Released On \$250 Million Bail</u>
<u>Alameda Research Secretly Funded Crypto Media Site The Block And Its CEO</u>	<u>MicroStrategy Increases Bitcoin Holdings By 2,500 And Now Holds 132,500 BTC</u>
<u>US Justice Dept Is Split Over Charging Binance As Crypto World Falters</u>	<u>Crypto Asset Manager Valkyrie Investments Wants to Sponsor, Manage Grayscale Bitcoin Trust</u>
<u>FTX Founder Sam Bankman-Fried Arrested In The Bahamas</u>	
<u>SEC Charges Samuel Bankman-Fried With Defrauding Investors</u>	
<u>Former FTX CEO Sam Bankman-Fried's Bail Application Denied In The Bahamas</u>	
<u>SEC Doubles Down On Decision To Reject Grayscale Spot ETF</u>	



Strong Holders Continue To Deal With Diminished Network Activity

	Bitcoin Metrics ¹	Unit	December 2022	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	151.8	-4.2%	+45.6%	Neutral	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	\$15.3	+8%	-64.7%	Neutral	↑
Network Usage	<u>Active Owners²</u> (Active Entities, 7-Day Moving Average)	Thousands	231.7	-7.7%	-10.2%	Bearish	↓
	<u>Transaction Volume²</u> (7-Day Moving Average)	BTC (Thousands)	130.4	-17.1%	-20.1%	Neutral	No Change
Holder Behavior	<u>Long-Term-Holder Supply²</u> (Coins Held for 155 Days+)	BTC (Millions)	13.99	+1.1%	+5.4%	Bullish	No Change
	<u>Locked Supply²</u> (Illiquid Supply)	BTC (Millions)	15.05	+0.7%	+7.3%	Bullish	No Change
	<u>Time-Weighted Turnover²</u> (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	11.6	+22.4%	+49.2%	Bearish	↓

[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms on page 20 of this report. [2] Data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. [3] Arrows displayed in the "Upgrade/Downgrade" column convey the change in our view of that metric compared to last month. For instance, if our view changes from bearish to neutral, the arrow will be green, and so forth.

Source: ARK Investment Management LLC, 2023. Data sourced from [Glassnode](#). Some data may be subject to change over time since they are entity-adjusted in real time. Information as of December 31, 2022.

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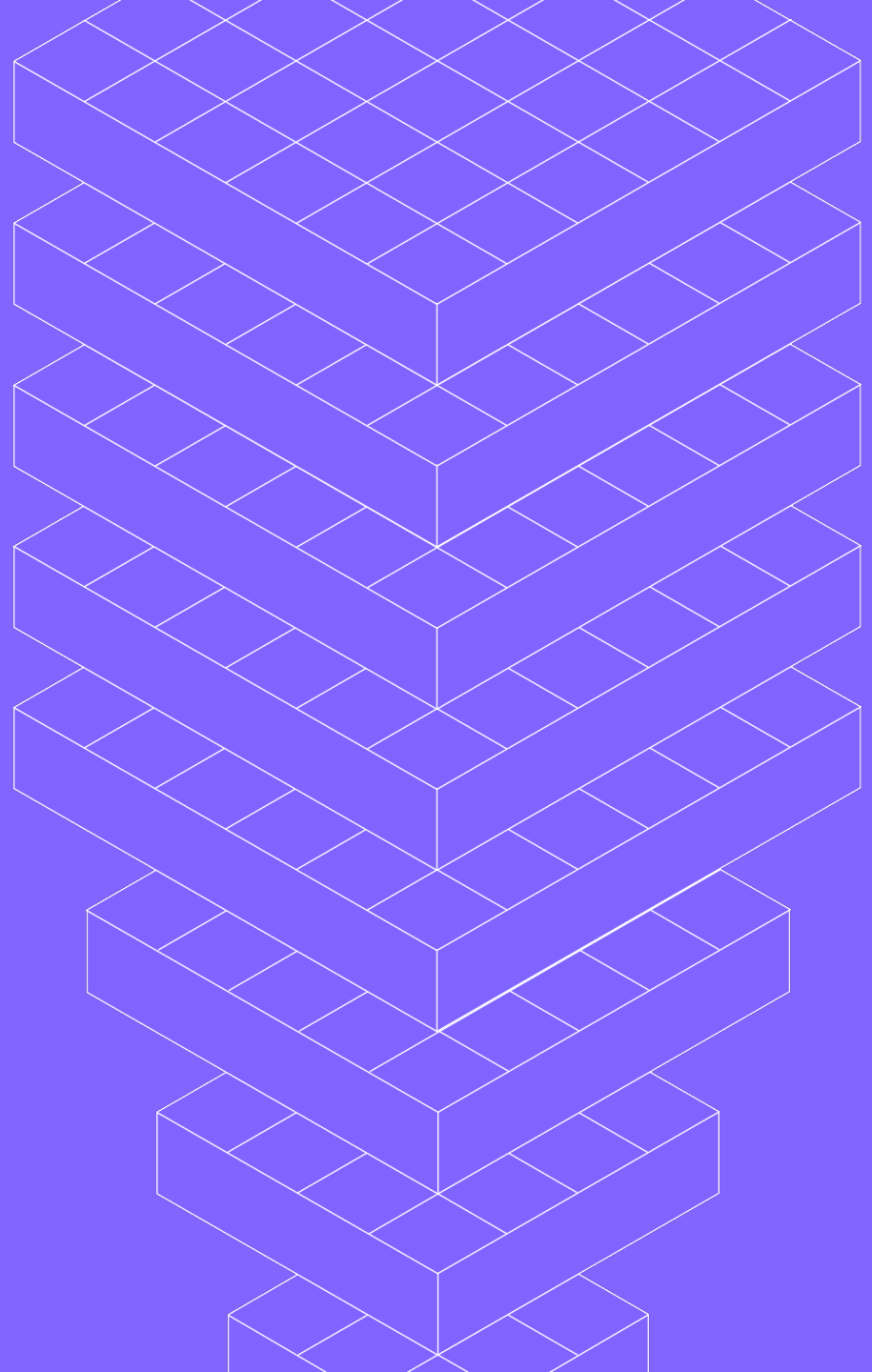
The Market Cost Basis Has Dropped Below \$20k For The First Time Since Mid-2021

	Bitcoin Metrics ¹	Unit	December 2022	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$19,776	-1.9%	-19.2%	Bullish	No Change
	<u>Percent Supply In Profit</u>	pp	48.2%	-7.5 pp	-22.9 pp	Bullish	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$18,002	-3.7%	-66%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	-11.9%	+1.5 pp	-11.9 pp	Neutral	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated, 7-Day Exponential Moving Average)	pp	-0.03%	-0.02 pp	-0.02 pp	Bullish	No Change
	<u>Expiration Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	-0.6%	-0.6 pp	-7.9 pp	Bullish	No Change

[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms on page 20 of this report. [2] Data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. [3] Arrows displayed in the "Upgrade/Downgrade" column convey the change in our view of that metric compared to last month. For instance, if our view changes from bearish to neutral, the arrow will be green, and so forth.

Source: ARK Investment Management LLC, 2023. Data sourced from [Glassnode](#). Some data may be subject to change over time since they are entity-adjusted in real time. The perpetual futures basis was estimated internally on the basis of data from TradingView, and it is subject to change. Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency.

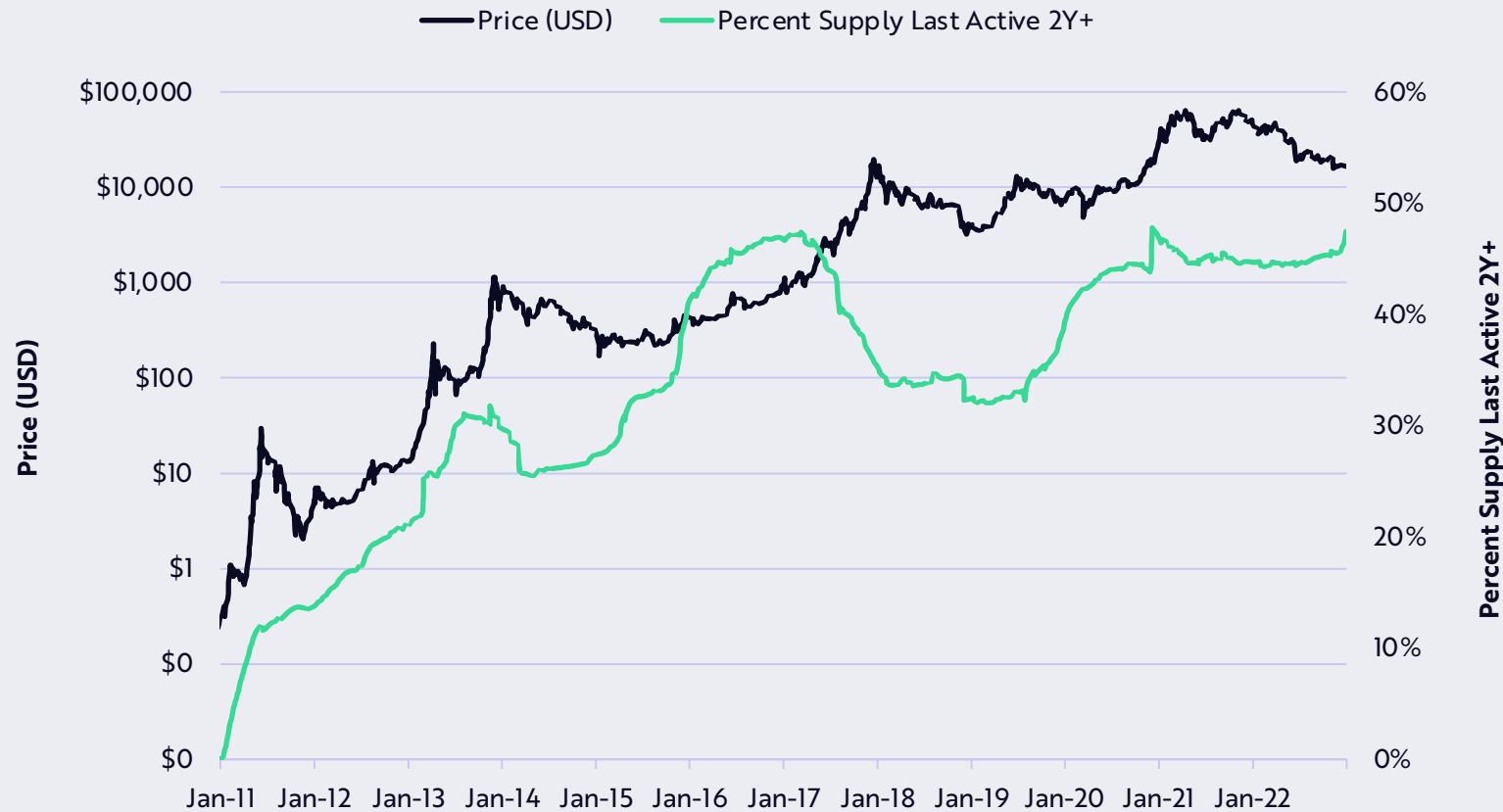
The State Of Bitcoin





Nearly 50% Of Bitcoin Has Not Moved Since January 2021

Bitcoin Supply Last Active 2 Years Ago or More



ARK'S VIEW: BULLISH

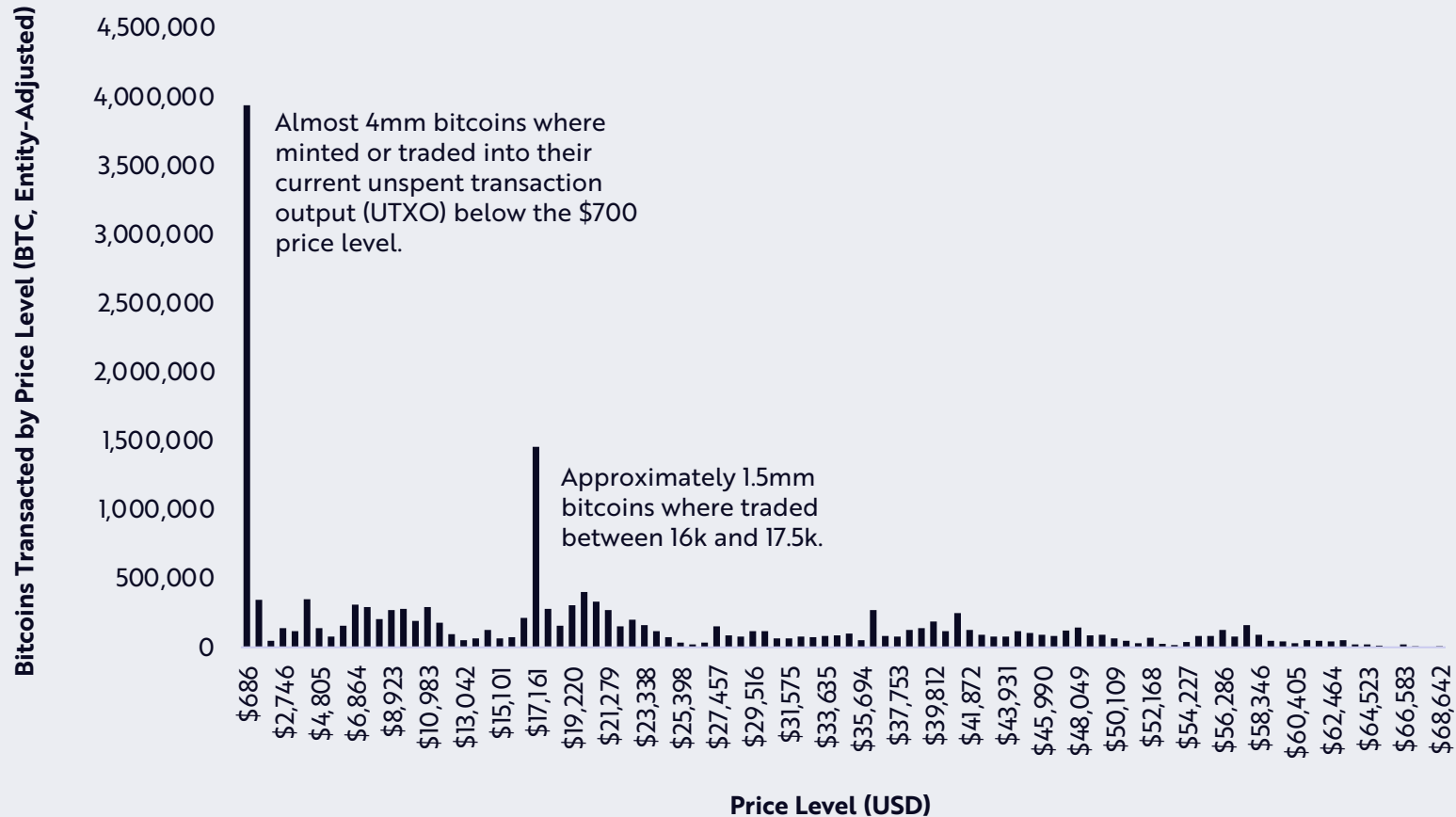
- A show of strong holder behavior, especially over long-term time horizons, the percentage of supply that last moved 2 years ago or more closed the year at 47%—nearly an all-time high.
- This is the first time since late 2022, and the second since early 2017, that this metric presents current values, both instances preceding impulsive bullish price action.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Nearly 1.5mm Bitcoins Changed Hands At Prices Between \$16k-\$17.5k

Bitcoins Transacted by Price Levels



ARK'S VIEW: BULLISH

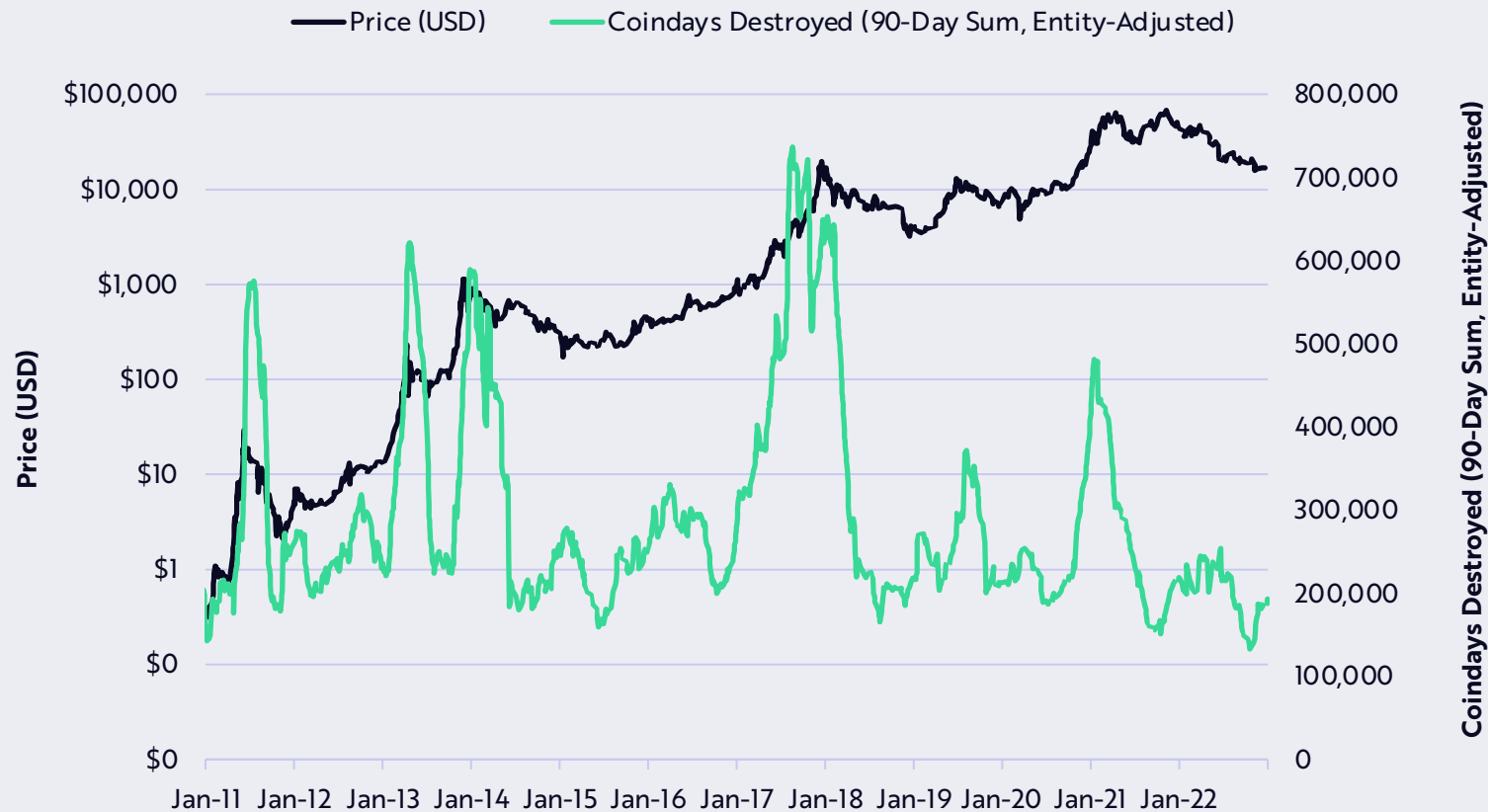
- Barring price levels below \$700, where most bitcoin in existence were mined and transacted in the early years of the Bitcoin network, the levels between \$16,000 and \$17,500 present the zone where the most bitcoins changed hands in history (7% of outstanding supply)—making it, we believe, a strong area of support.
- Three factors potentially caused high amounts of bitcoin to be transacted at such reduced price levels: (1) major outflows from exchanges in the aftermath of the fall of FTX; (2) volume of capitulation in the market; and (3) buyers accumulating during that selloff.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. Data may be subject to change over time since it is entity-adjusted in real time via a machine-learning algorithm. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Despite A 40% Increase Since October, Bitcoin Spending Behavior Has Remained 60% Below Its Early-2021 High

Bitcoin Time-Weighted Turnover (Coindays Destroyed)



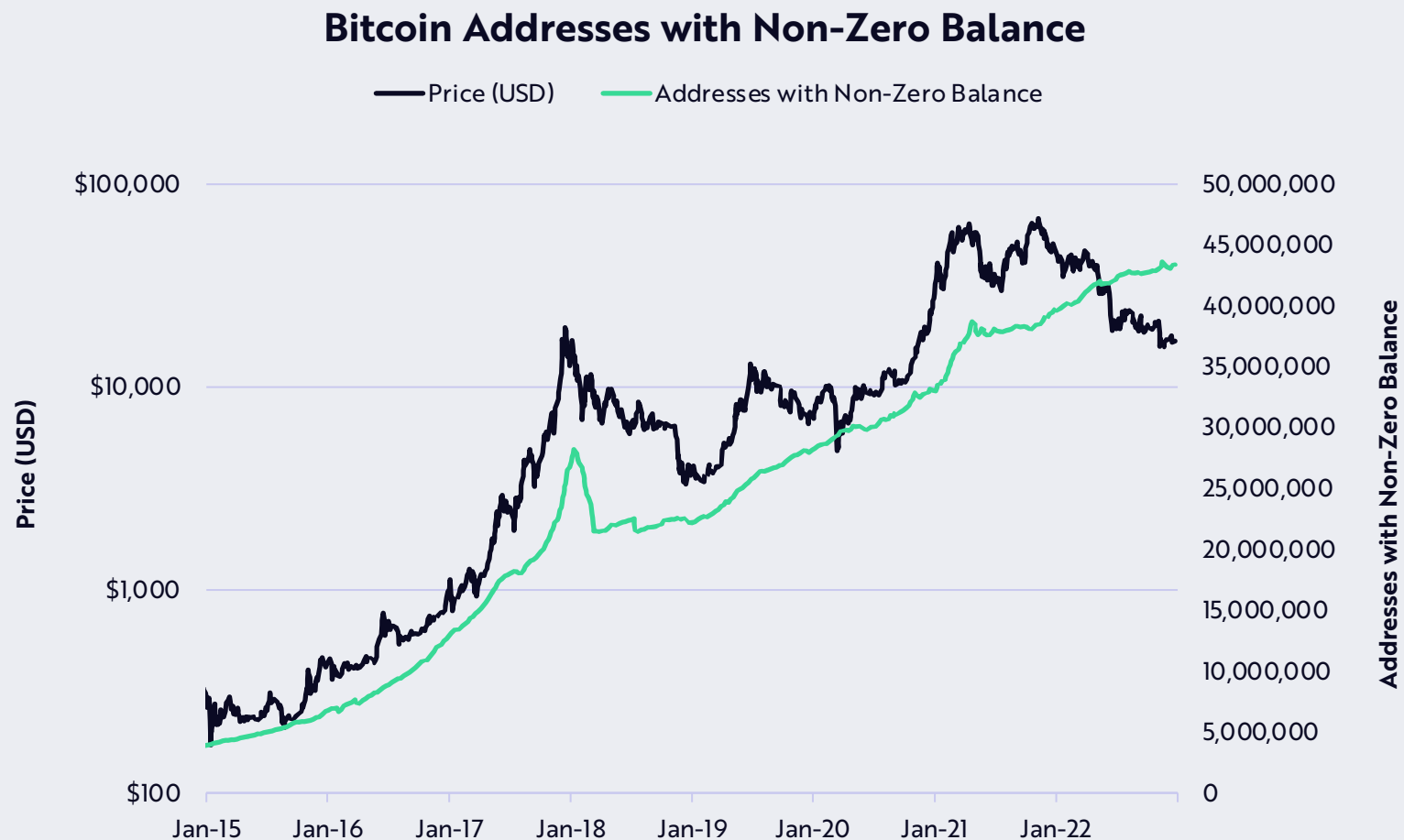
ARK'S VIEW: BULLISH

- Despite major turnover during November and December following the fall of FTX, the age of coins distributed appears to have remained low on a quarterly basis.
- In our view, although the spending of old coins is common in bear markets, a low value of coindays destroyed conveys that holders remained strong despite the multiple frauds and grey swans during 2022.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. Data may be subject to change over time since it is entity-adjusted in real time via a machine-learning algorithm. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



The Number Of Addresses With A Non-Zero Balance Has Stalled Since November



ARK'S VIEW: NEUTRAL

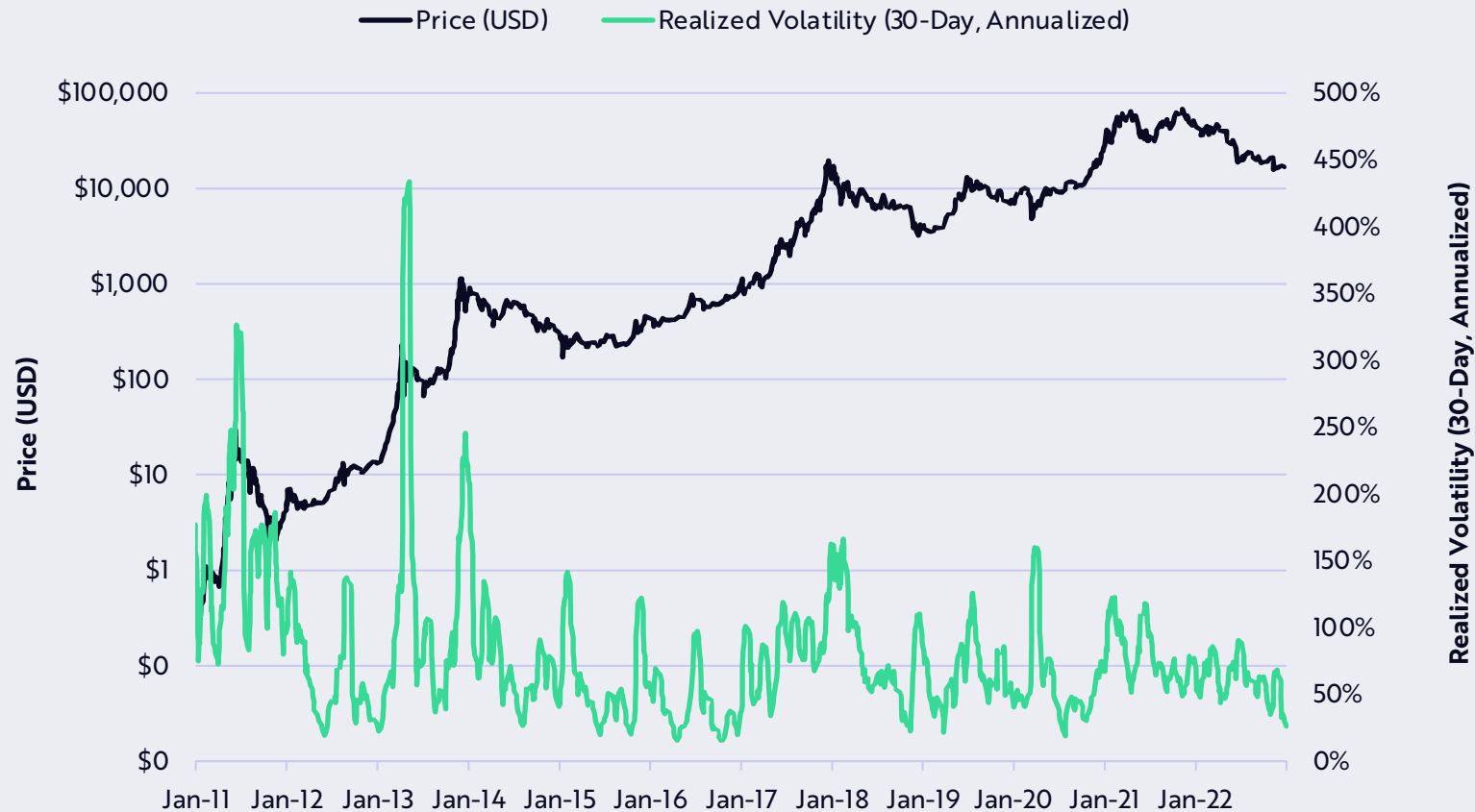
- Deviating from its usual, linear increase, the number of addresses with a non-zero balance stalled after hitting an all-time high in November.
- We believe this confirms uncertainty on the part of potential new market participants deciding whether to remain on the sidelines for the time being.
- Non-zero addresses express bitcoin holding, whether sending and receiving funds or remaining dormant.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Bitcoin's Monthly Volatility Reached 25% At The Close Of 2022, Its Lowest Level Since Late-2020

Bitcoin Realized Volatility



ARK'S VIEW: NEUTRAL

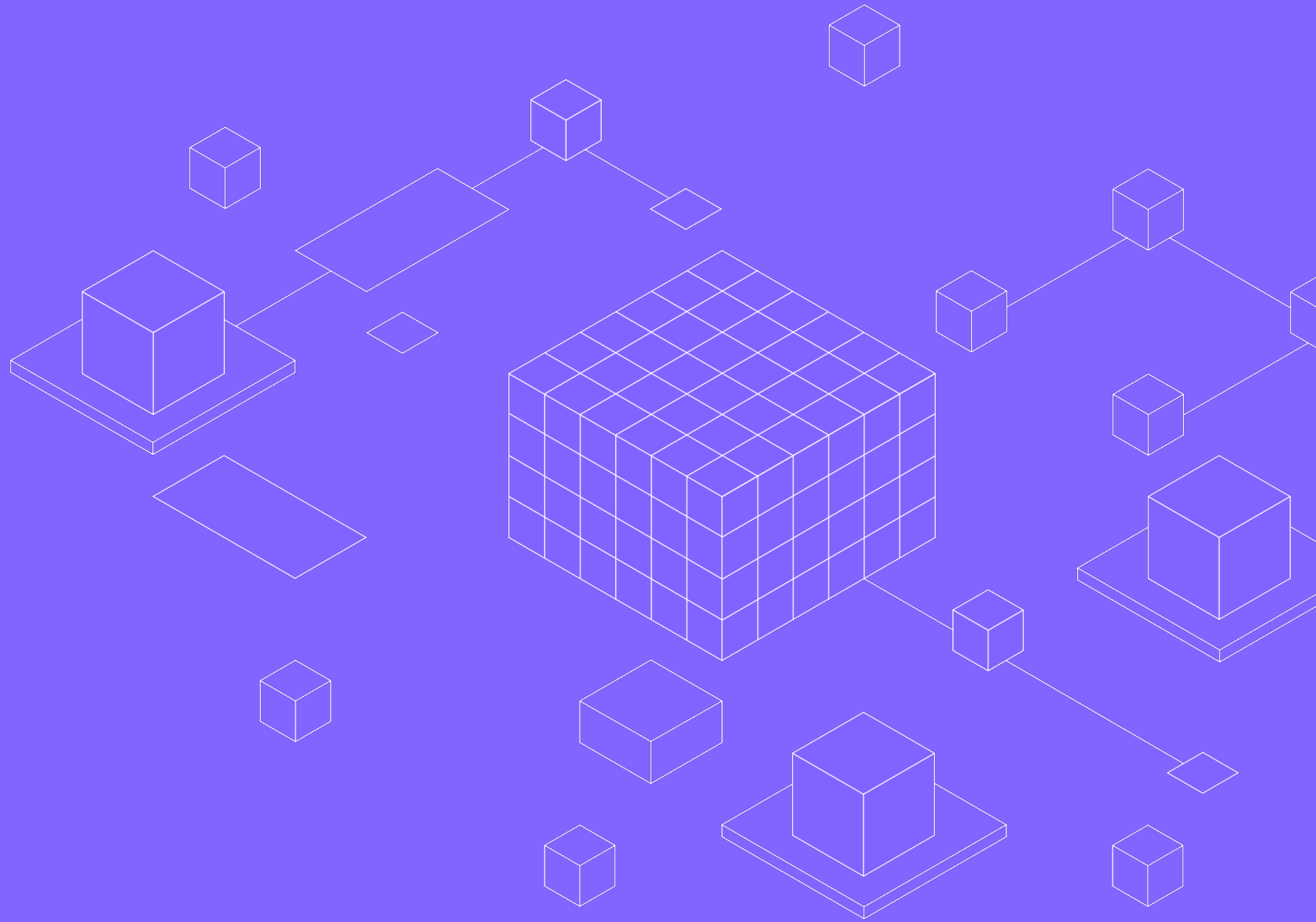
- After a brief spike during November, December saw a dip in valuation volatility unseen since mid- and late-2020 and late-2018.
- Although low volatility generally is a neutral signal, in our view it does suggest an upcoming expansion in the form of a breakout or a breakdown.
- We believe important market direction may come during the first quarter of 2023 given the potential impulse of the price move.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Section 03

The State Of The Industry





Grayscale Discount Has Persisted As DCG Holds Out For Liquidity Resolution

GBTC Premium/Discount to Net Asset Value (NAV)



ARK'S VIEW: BEARISH

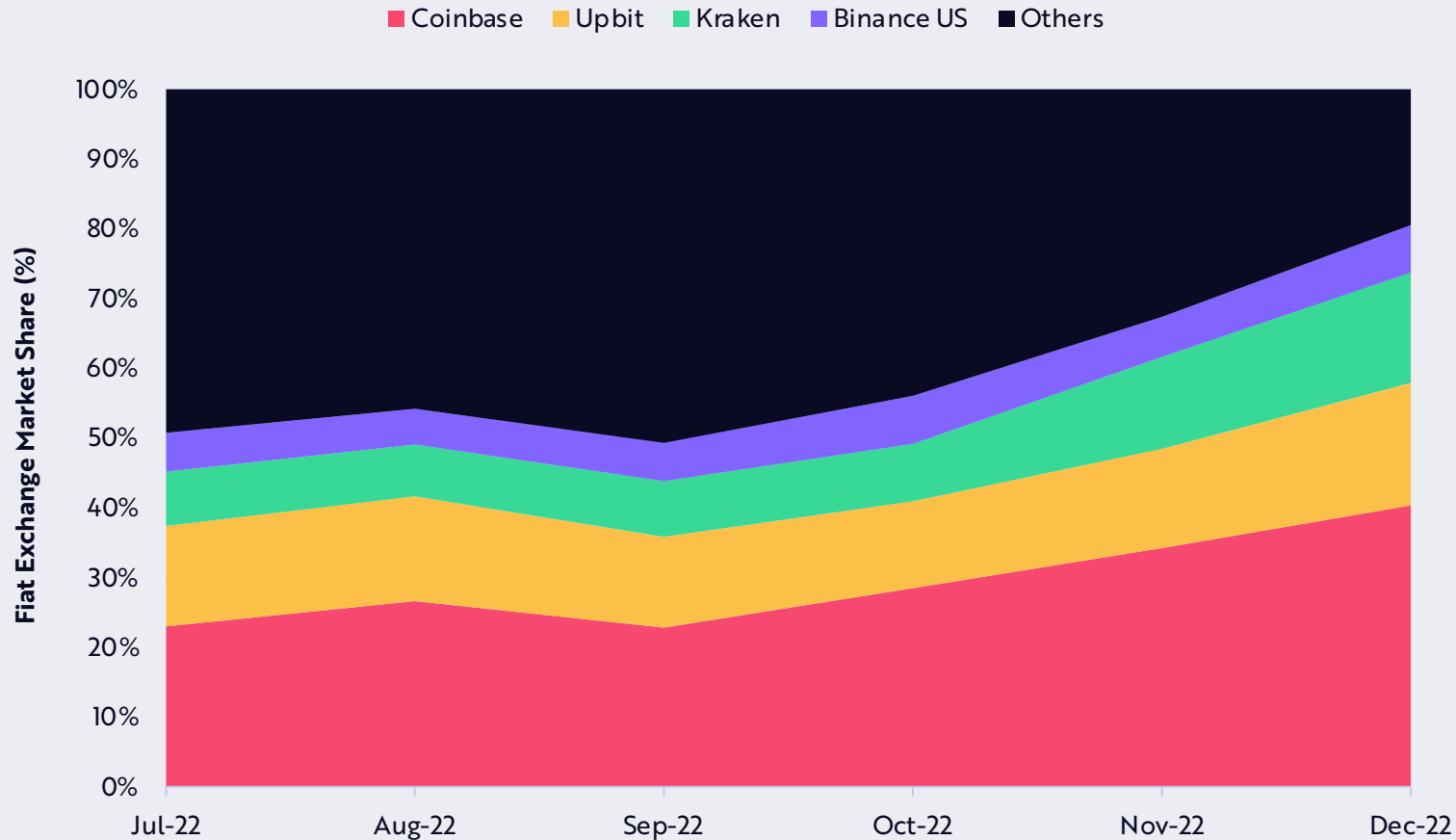
- The Digital Currency Group (DCG) appears to be one of the biggest questions marks in the crypto industry at this time.
- After a quiet December, Cameron Winklevoss, co-founder of Gemini and Gemini Earn, [published an open letter](#) to Barry Silbert, founder and CEO of DCG.
- Winklevoss stated that DCG owed its subsidiary crypto broker-dealer Genesis \$1.675 billion; he also alleged that this money had been used to “fuel greedy share buybacks, illiquid venture investments, and kamizake Grayscale NAV trades [...] at the expense of creditors.”
- Silbert [denied the allegation](#): “DCG did not borrow \$1.675 billion from Genesis DCG has never missed an interest payment to Genesis and is current on all loans outstanding. Next loan maturity is May 2023.”
- Winklevoss requested a liquidity resolution by January 8, 2023.
- A proxy of how the market is pricing the uncertainty of DCG, the Grayscale Bitcoin Trust (GBTC) closed the year at a 45% discount.

Source: ARK Investment Management LLC, 2023. Data from Ycharts (www.ycharts.com/companies/GBTC/discount_or_premium_to_nav). Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Coinbase Claimed Up To 40% Market Share After The Fall Of FTX

Fiat Exchange Market Share



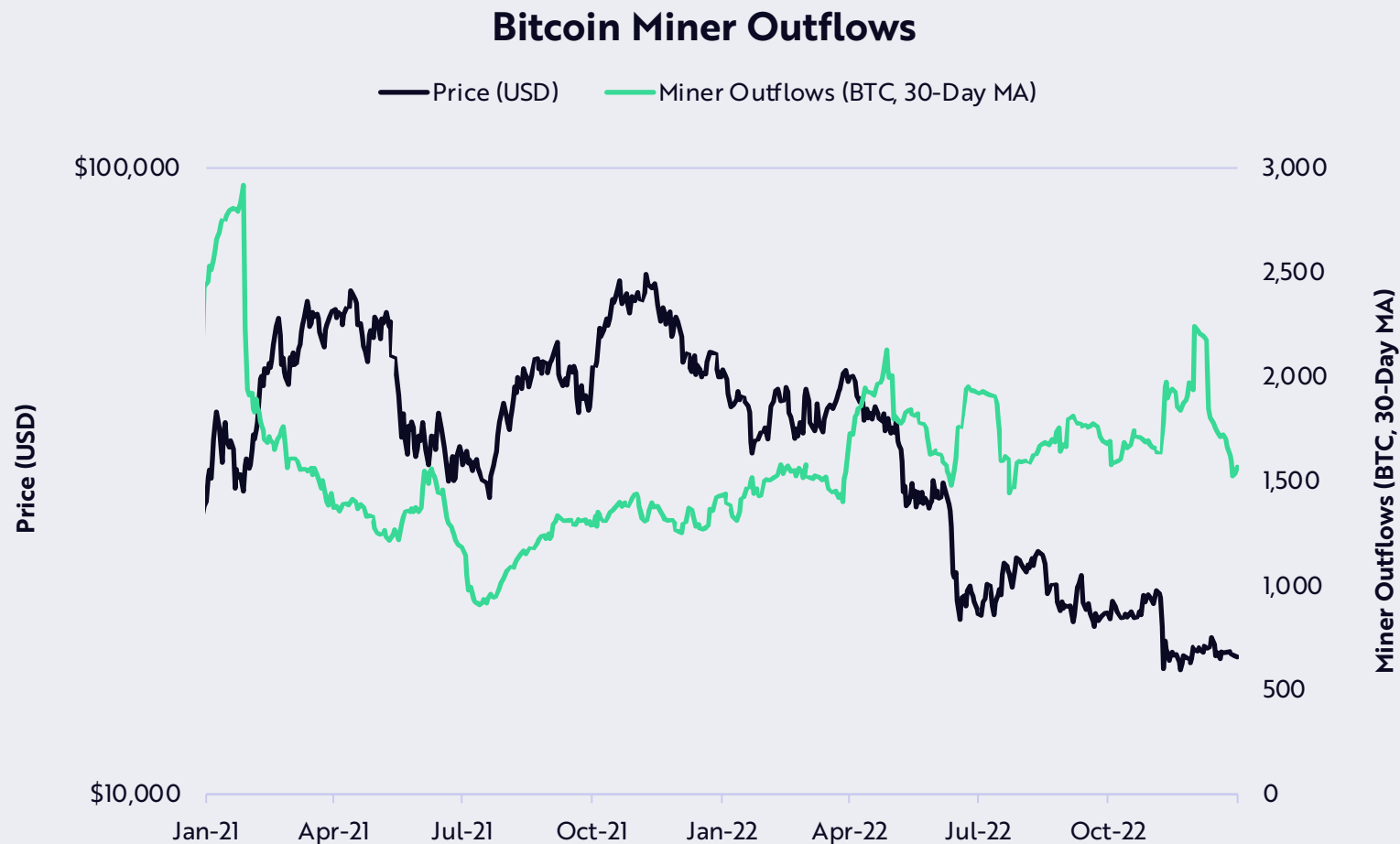
ARK'S VIEW: BULLISH

- In the wake of FTX's collapse, Coinbase appears to have gained dominance amongst "fiat" exchanges—or crypto exchanges dealing only or mostly in USD (not stablecoins) in spot, as opposed to futures contracts.
- Most fiat exchanges fall within the jurisdiction of US regulation.
- In just six months, Coinbase's market share increased from 22% to 40%.

Source: ARK Investment Management LLC, 2023. Data from The Block (www.theblock.co/data/crypto-markets/spot/fiat-exchange-market-share). Information as of December 31, 2022. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon.



Miner Outflows Have Decreased 44% During December As Consolidation Picks Up



ARK'S VIEW: BULLISH

- Decreasing price and ascending difficulty to mine hurt bitcoin miners in 2022. Their selling, as measured by outflows from bitcoin addresses under their ownership, increased in November as FTX fell apart.
- However, miner outflows reduced by 44% during December, as miner reserves increased by 21 basis points,¹ potentially suggesting that weaker miners have been left spent and inoperative. This appears to be confirmed by [the Chapter 11 filing by Core Scientific](#) on December 21, 2022.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#). Information as of December 31, 2022. Data may be subject to change over time since it is entity-adjusted in real time via a machine-learning algorithm. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency. Forecasts are inherently limited and cannot be relied upon. [1] One basis point equals 1/100 of a percentage point, or 0.01%.



Section 04

Appendix: Glossary Of Terms





Glossary Of Terms

Active Owners: An individual or organization managing the same set of addresses sending and receiving funds. Also known as active entities.

Backwardation: Describes when futures trade at a price lower than spot, denoting bullish market sentiment.

Contango: Describes when expirational futures contracts are trading at a price higher than spot, suggesting a bearish market environment.

Delta Cost Basis: An adjusted version of the market cost basis. It is calculated by subtracting the life-to-date moving average of bitcoin's price from its realized price. The measure is used to gauge the downside risk of a bear market. Also known as delta price or delta cap.

Difficulty: Computational power required to validate transactions in the network. "Exa-" and "tera-" hashes per second refer to units of account to a factor of 10^{18} and 10^{12} , respectively. Higher difficulty implies higher network security.

Exchange Supply: The number of bitcoins held in addresses controlled by exchanges.

Expirational Futures Basis: The difference between the price of spot and the price of expirational futures contracts.

Futures Basis: The difference between the price of spot and the price of a perpetual or expirational contract.

Investor Cost Basis: An adjusted version of the market cost basis. It is calculated by subtracting the life-to-date cumulative miner revenue in USD (thermo cap) from realized price. Also known as investor price or investor cap.

Locked Supply: The supply held by entities that have <25% probability of spending, as per their historical behavior. Also known as illiquid supply.

Long-term Holding and Holders (LTH): Related to supply last moved 155 days ago or more, the threshold at which the possibility of a bitcoin to remain unmoved increases drastically.

Market Cost Basis: The on-chain volume-weighted average price of the market, calculated by aggregating the value of all bitcoins in circulation at the time when they last moved. Also known as realized price or realized cap.

Miner Revenue: The number of bitcoins (in USD value) block miners obtain for securing the network.

MVRV Ratios: Market cap divided by different on-chain cost bases of the market, such as realized cap or short-term-holder realized cap.

Net Realized Profit/Loss (NRPL): The difference between realized profit and realized loss, normalized by market cap.

Net Unrealized Profit/Loss (NUPL): The difference between unrealized profit and unrealized loss, normalized by market cap. It measures current value relative to the aggregate cost basis (realized cap) of the market to determine how much the network is in profit or loss.

Patoshi: Entity estimated to be Satoshi Nakamoto, the creator and first miner of bitcoin.

Perpetual Futures Basis: The difference between the price of spot and the price of non-expirational futures contracts.

Puell Multiple: Miner revenue (USD) divided by the 365-day moving average of miner revenue (USD). It measures miner earnings relative to their yearly average.

Realized Returns: The ratio reached by dividing the average price of bitcoins spent that day by the average price when they last moved. In essence, it is the ratio of price sold and price bought for the coins that moved that day. Also known as spent output ratio, or SOPR.

Regional Cumulative Price Change: The sum of month-over-month (30-day) price action during the business hours of the major financial hubs worldwide: New York for the US, London for Europe, and Hong Kong for Asia.

Short-term Holding and Holders (STH): Related to supply that moved in the last 155 days, the threshold at which the possibility for a bitcoin to move again increases drastically.

Supply in Profit: The percentage of bitcoins currently at a higher price compared to the price at which they last moved.

Time-weighted Turnover: The number of bitcoins traded that day, multiplied by the amount of time each coin had remained dormant. Also known as coindays destroyed.

Transaction Volume: The number of bitcoins that changed hands on any given day.



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