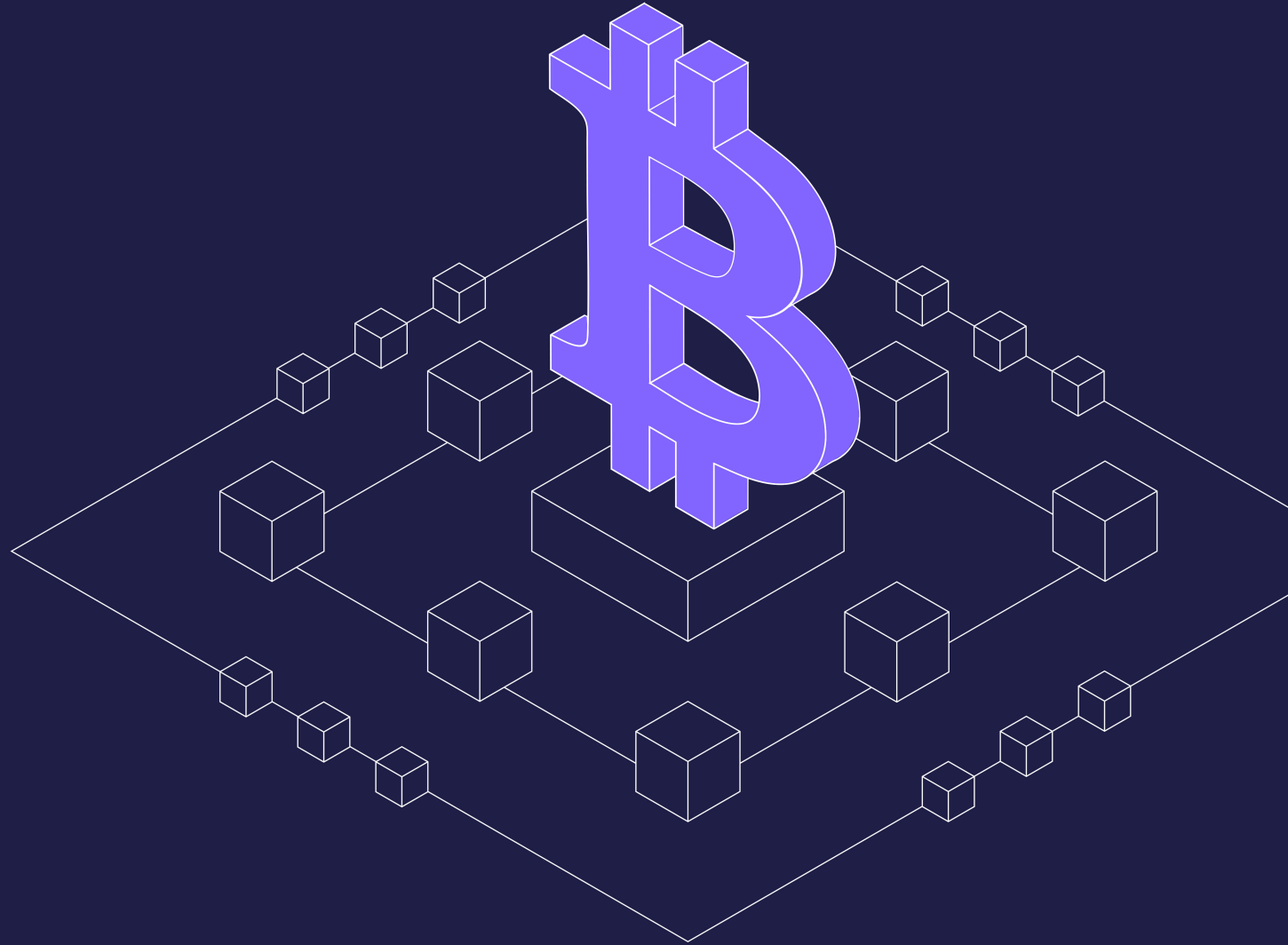




As of July 31, 2023

THE BITCOIN MONTHLY

BITCOIN—BREAKOUT OR BREAKDOWN?



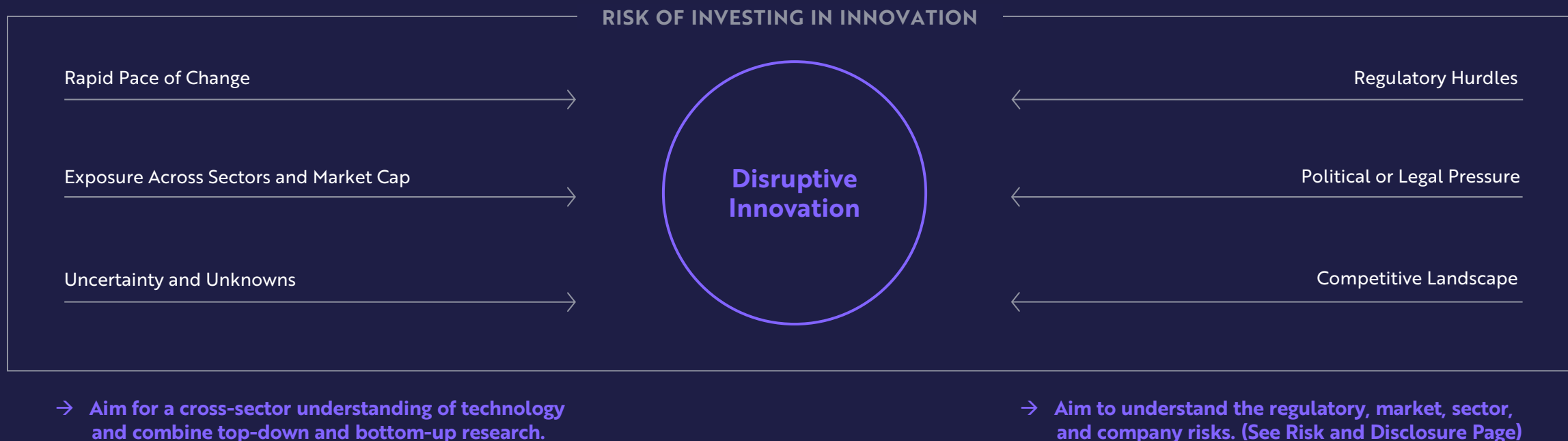
For Informational Purposes Only. ARK Investment Management LLC, 2023. This is not investment advice or a recommendation in relation to any named particular securities or cryptocurrencies and no warranty or guarantee is provided. Any references to particular securities or cryptocurrencies are for illustrative purposes only. The reader should not assume that an investment identified was or will be profitable. Certain information was obtained from sources that ARK believes to be reliable; however, ARK does not guarantee the accuracy or completeness of any information obtained from any third party. Forecasts are inherently limited and cannot be relied upon. **PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE PERFORMANCE; FUTURE RETURNS ARE NOT GUARANTEED.**



RISKS OF INVESTING IN INNOVATION

Please note: Companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. ARK aims to educate investors and seeks to size the potential investment opportunity, noting that risks and uncertainties may impact our projections and research models. Investors should use the content presented for informational purposes only, and be aware of market risk, disruptive innovation risk, regulatory risk, and risks related to certain innovation areas.

Please read risk disclosure carefully.





SECTIONS

01

Market Summary

02

Low Bitcoin Volatility: Breakdown Or Breakout?

03

Fed Tightening: A Leading Indicator Of Price Deflation?

04

Appendix: Glossary Of Terms



Section 01

Market Summary





Low Bitcoin Volatility Could Be Pointing To A Major Price Move

Low Bitcoin Volatility: Breakdown Or Breakout?

- Bitcoin's volatility dropped to a 6-year low during July, suggesting the potential for significant price action in either direction.
- Also in July, the supply of bitcoin held by long-term holders hit an all-time high at 74.88% of circulating supply. As a result, short-term holders ended the month at near breakeven in terms of profits.
- The healthy equilibrium between short- and long-term holders suggests strong fundamentals, paving the way potentially for a sustained uptrend in the bitcoin price.

Fed Tightening: A Leading Indicator Of Price Deflation?

- Given the lags associated with monetary policy, the real economy and inflation have yet to digest 300-500 basis points¹ of the US Federal Reserve's tightening.
- China is exporting deflation to its trading partners, including the United States.²

ARK'S KEY TAKEAWAYS

- In July, bitcoin's price fell 4.1% to \$29,230, finding technical support 9.7% above \$26,623, its 200-week moving average.
- Given regulatory uncertainty, its ability to find technical support is testimony to bitcoin's resilience.

[1] A basis point is equal to 1/100 of a percentage point, or .01%. [2] See slide 19 for more information. Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#) unless otherwise specified. Data valid as of July 31, 2023, 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

[BlackRock CEO Larry Fink Sees bitcoin As "Digitizing Gold"](#)

[Crypto Exchange Binance Hit By Executive Exodus](#)

[Gemini Files Lawsuit Against Digital Currency Group](#)

[Celsius Founder Alex Mashinsky Arrested And Charged With Fraud](#)

[Ripple Labs Notches Landmark Win In SEC Case Over XRP Cryptocurrency](#)

[Nasdaq Halts Plan For Crypto Custody Service Due To US Regulatory Conditions](#)

[Coinbase To Wind Down Lending Program Over Coming Months](#)

[Binance, CEO Plan To Seek Dismissal Of CFTC Complaint](#)

[Sequoia Slashes Its Crypto Fund By 66% After Industry Collapses](#)

[Microstrategy Acquired 12,800 bitcoins Since Q1](#)

[SEC Sues Richard Heart And His Projects Hex, PulseChain And PulseX For Fraud, Securities Violations](#)

[Binance Japan Launches Crypto Services With 34 Virtual Currencies](#)

[The Last Weekend Of July Saw 6 Filings Of An ETH Futures ETF](#)



Bitcoin's Network Activity Is Still Healthy

	Bitcoin Metrics ¹	Unit	July 2023	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	224	+3.32%	+88.96%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	\$26.7	-3.66%	+25.28%	Bullish	No Change
Network Usage	<u>Active Owners²</u> (Active Entities, 7-Day Moving Average)	Thousands	280	+8.16%	+14.15%	Bullish	No Change
	<u>Transaction Volume²</u> (7-Day Moving Average)	BTC (Thousands)	108.7	-27.82%	-49.31%	Bearish	↓
Holder Behavior	<u>Long-Term-Holder Supply²</u> (Coins Held for 155 Days+)	BTC (Millions)	14.56	+0.62%	+8.44%	Bullish	No Change
	<u>Locked Supply²</u> (Illiquid Supply)	BTC (Millions)	15.26	+0.6%	+5.83%	Bullish	No Change
	<u>Time-Weighted Turnover²</u> (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	6.26	-37.97%	-4.66%	Bullish	↑

[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms on page 21 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. One arrow denotes a 1-tier change, and two arrows denote a 2-tier change. Source: ARK Investment Management LLC, 2023. Data sourced from [Classnode](#). Some data may be subject to change over time since they are entity-adjusted in real time. Information as of July 31, 2023. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency.

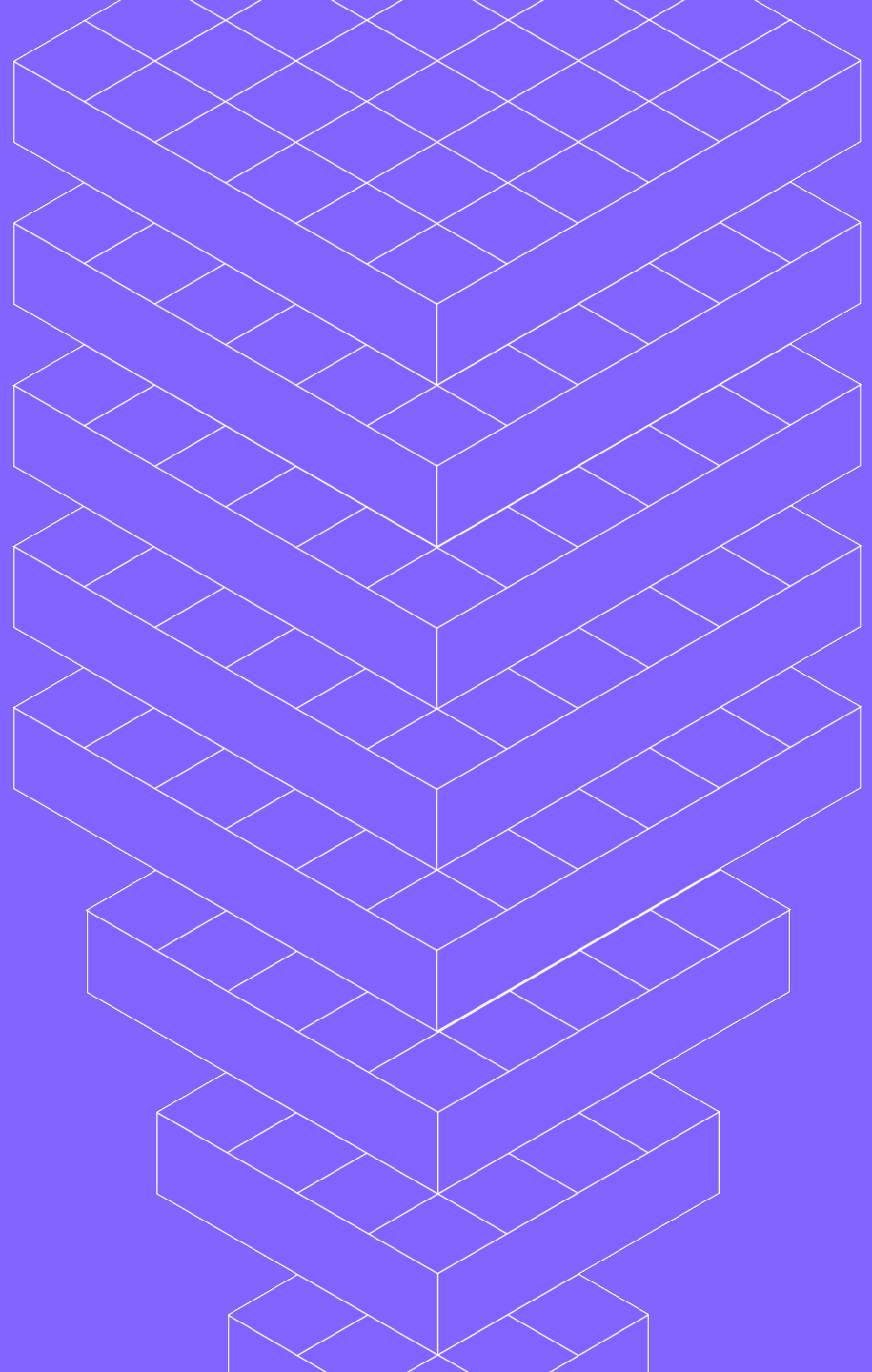


Despite A Slight Drop In Its Cost Basis, Bitcoin Still Is Priced Near Fair Value

	Bitcoin Metrics ¹	Unit	July 2023	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$20,356	-0.66%	-6.69%	Neutral	↓
	<u>Percent Supply In Profit</u>	pp	71.31%	-4.91 pp	+10.13 pp	Bullish	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$28,328	+2.92%	+0.91%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	1.4%	-5.03 pp	+6.41 pp	Bullish	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated, 7-Day Exponential Moving Average)	pp	-0.04%	-0.02 pp	-0.02 pp	Bullish	No Change
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	4.79%	+0.07 pp	+1.72 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 21 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. One arrow denotes a 1-tier change, and two arrows denote a 2-tier change. Source: ARK Investment Management LLC, 2023. Data sourced from [Classnode](#). 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 July 31, 2023. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency.

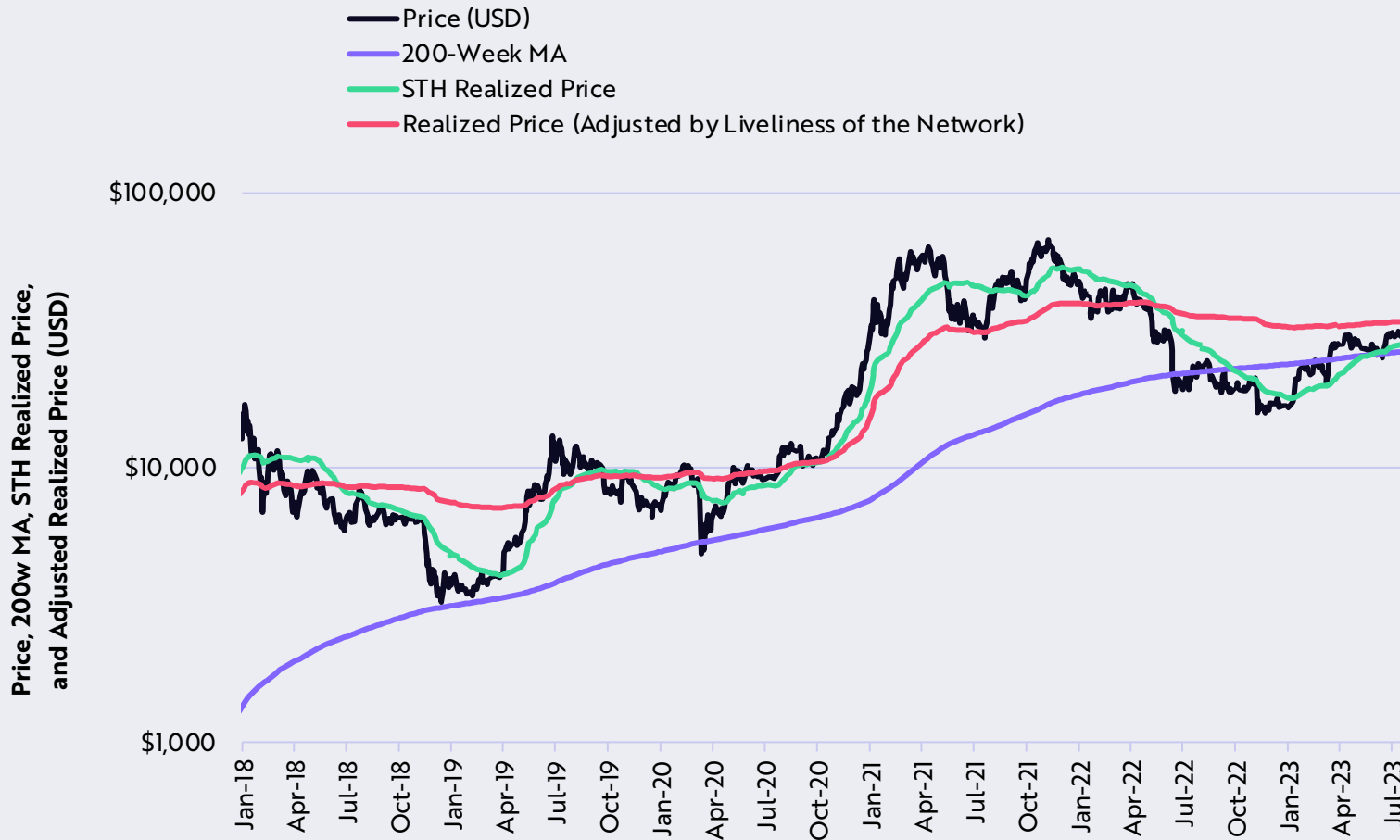
Low Bitcoin Volatility: Breakdown Or Breakout?





The Bitcoin Price Is Fluctuating Between Support And Resistance

Bitcoin Support and Resistance



ARK'S VIEW: BULLISH

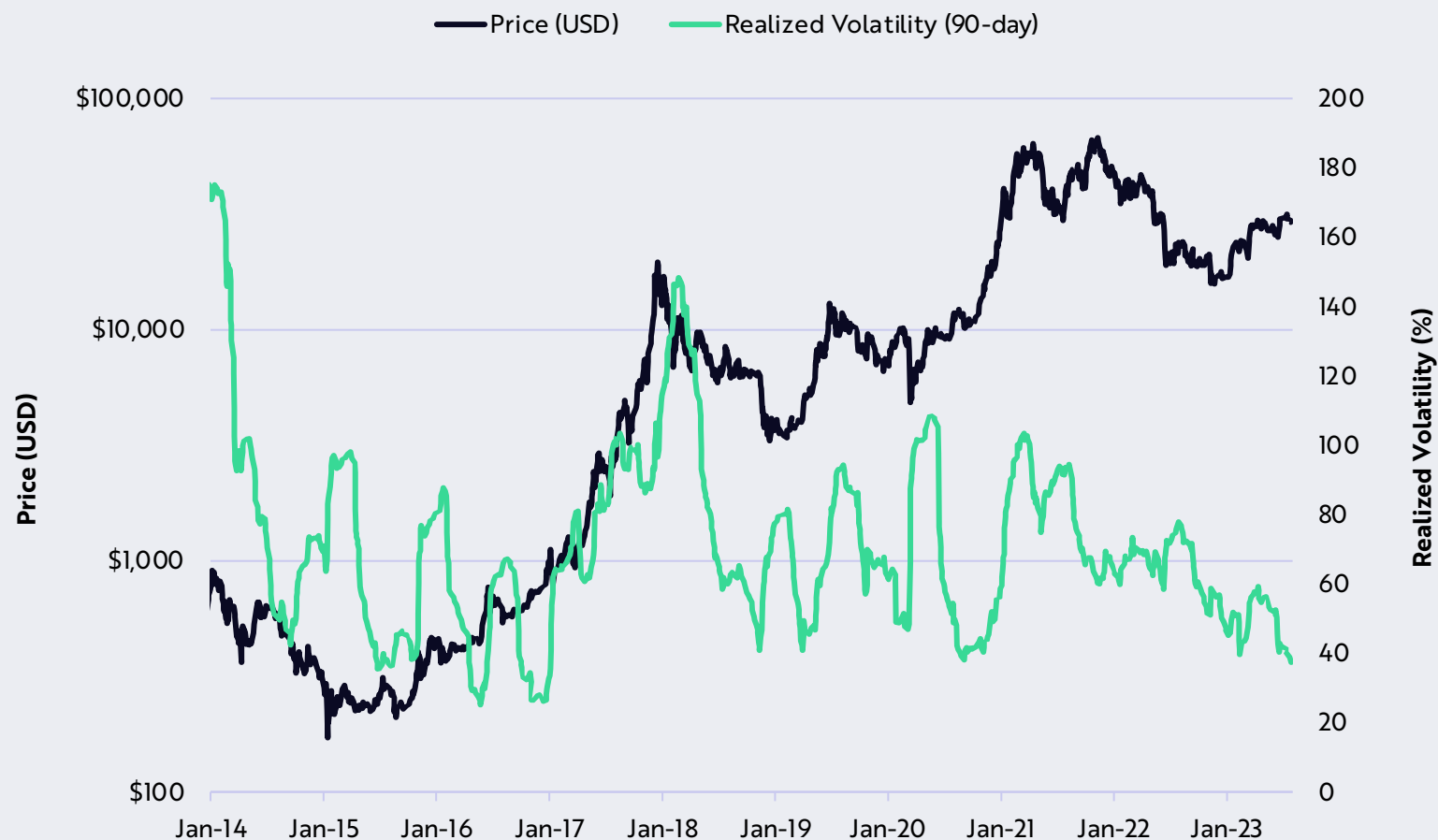
- At \$29,230, the bitcoin price ended the month above \$26,623, its 200-week moving average, and \$28,328, its short-term-holder (STH) cost basis.
- Conversely, the bitcoin price hit resistance at \$33,949, its liveliness-adjusted cost basis.

Source: ARK Investment Management LLC, 2023. Chart data from [Classnode](#). Data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Bitcoin's Volatility Has Reached Low Levels Not Seen Since 2017

Bitcoin Realized Volatility



ARK'S VIEW: NEUTRAL

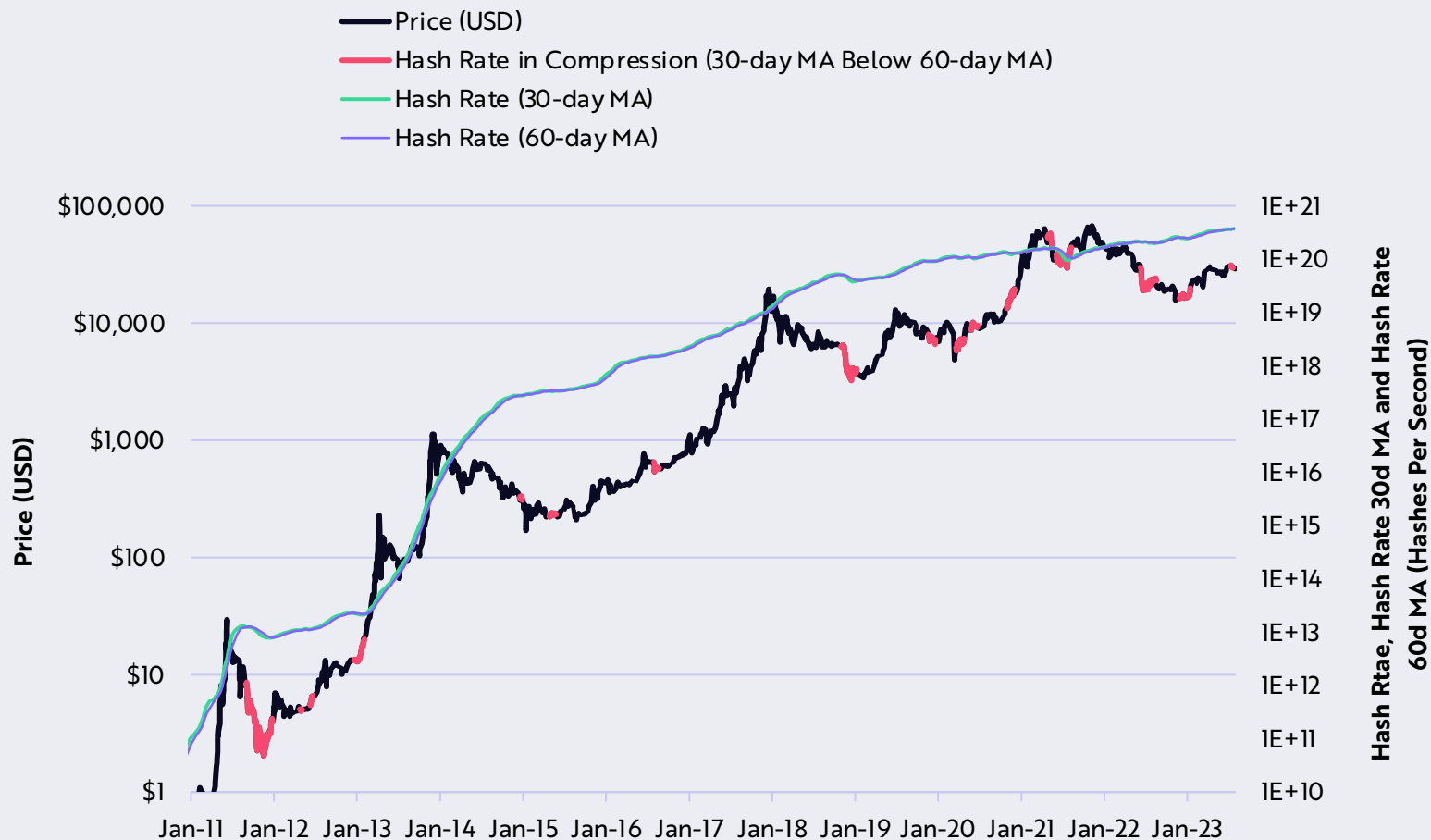
- In July, on a 90-day basis, bitcoin's price volatility dropped to 36%, a level not seen since January 2017.
- Based on its low level of volatility, we believe the bitcoin price could be setting up to move dramatically in one direction or the other during the next few months.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Bitcoin's Compressed Hash Rate¹ Suggests Miner Capitulation

Bitcoin Hash Rate Compression



ARK'S VIEW: BULLISH

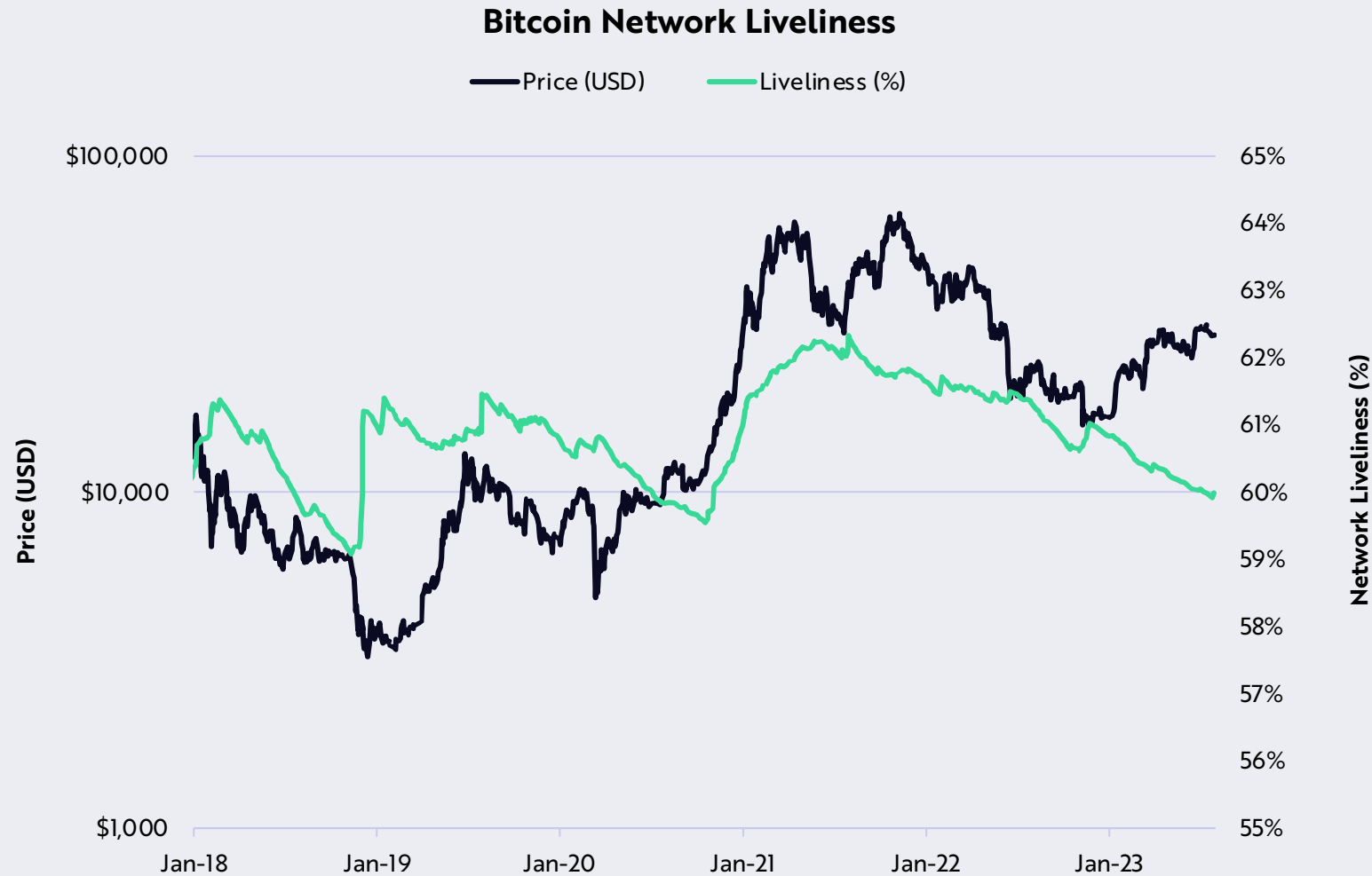
- During July, the 30-day moving average of bitcoin's hash rate dropped below its 60-day moving average, suggesting that miner activity had capitulated.
- Miner capitulation typically is associated with oversold conditions in bitcoin.

[1] Please refer to the Glossary of Terms on slide 21.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Bitcoin's Network Liveliness Has Dropped To Levels Not Seen Since Late 2020



ARK'S VIEW: BULLISH

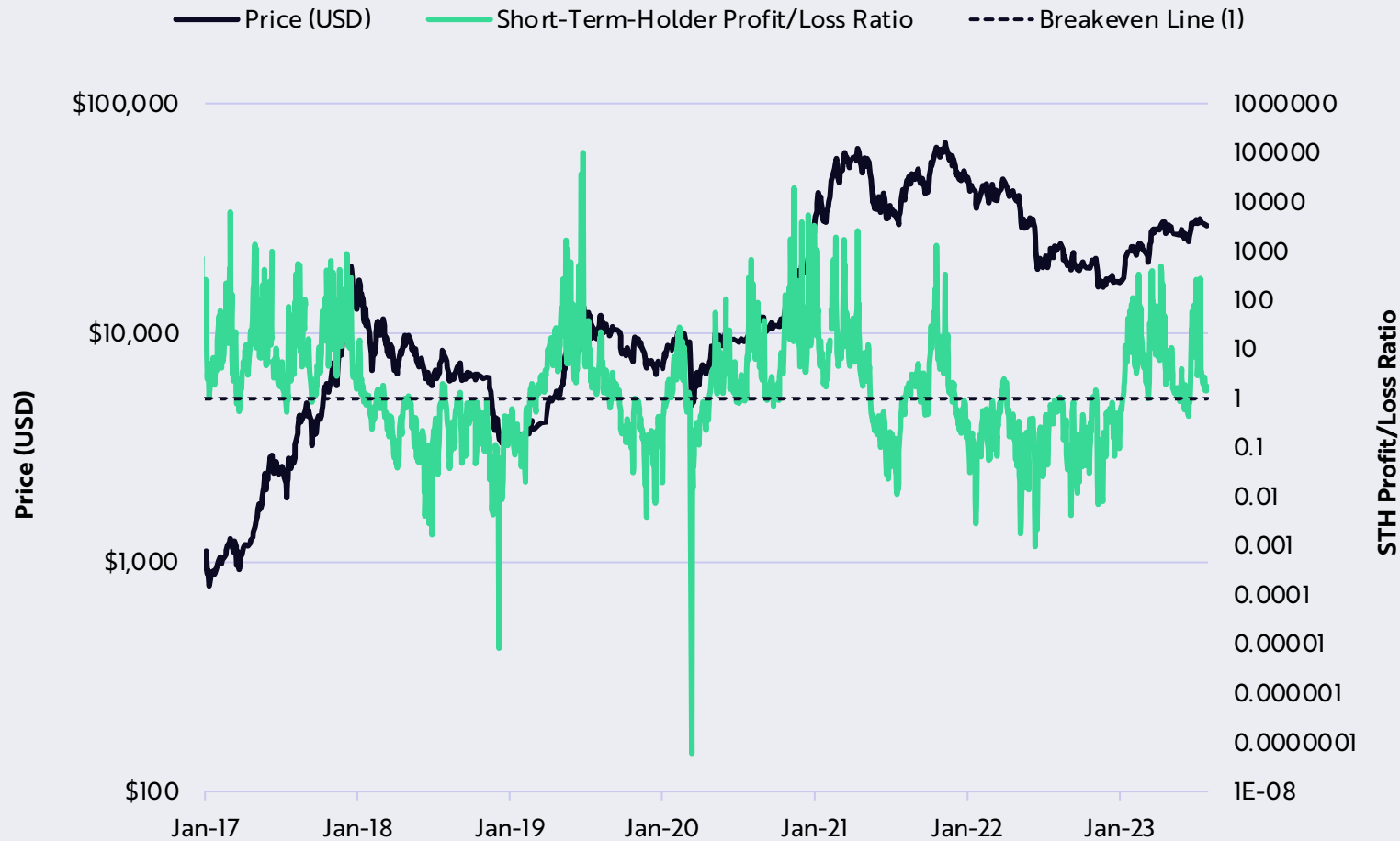
- "Liveliness" is the ratio of the sum of coindays created to the sum of coindays destroyed: it measures potential selling pressure relative to current holding behavior.
- In July, liveliness dropped below 60%, suggesting the strongest long-term holding behavior since the last quarter of 2020.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Short-Term Holders Closed July Near Breakeven

Bitcoin Short-Term-Holder Profit/Loss Ratio



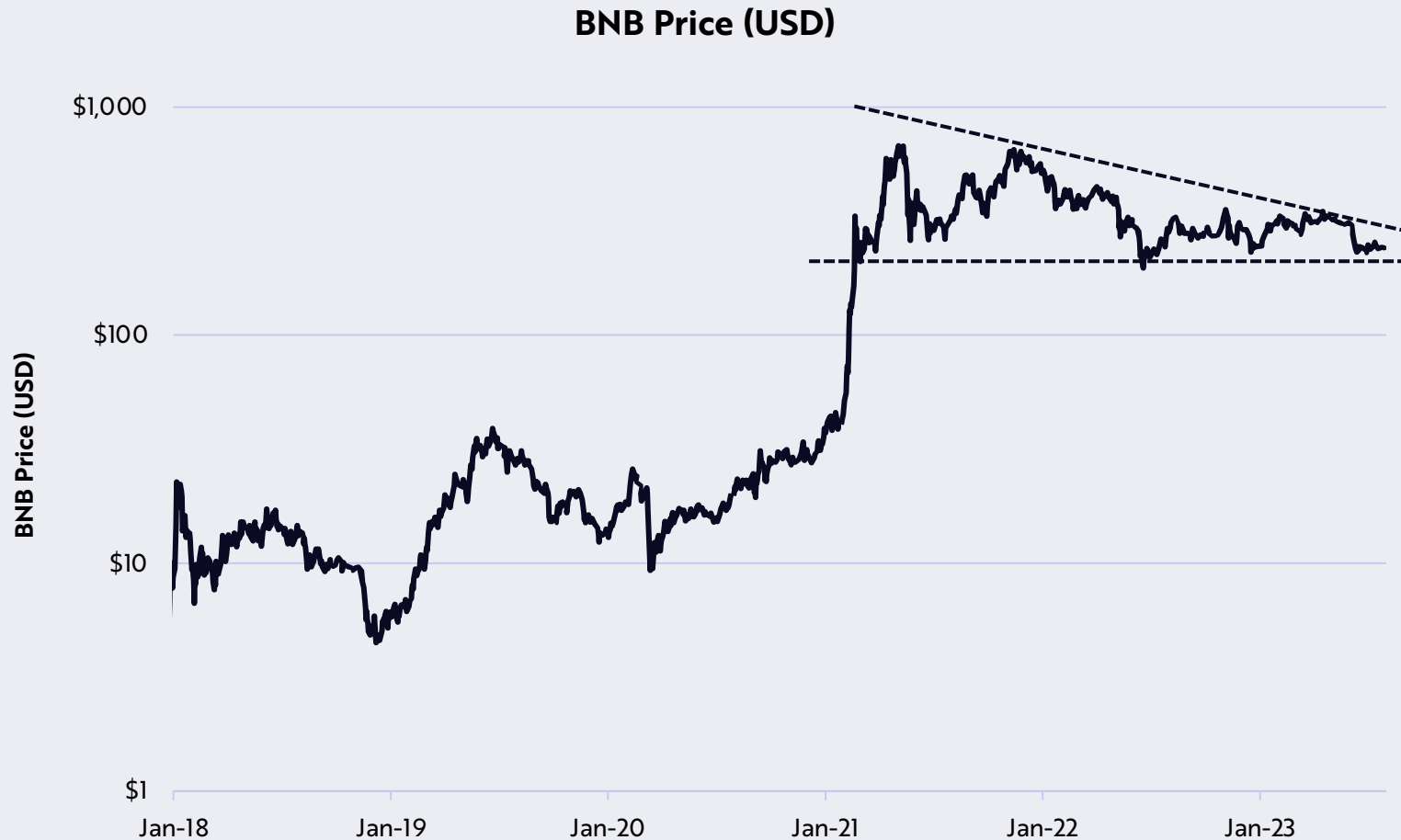
ARK'S VIEW: BULLISH

- ARK's measurement of short-term-holder profit/loss ratio ended July at ~1, suggesting that owners of coins that moved in the last 155 days were breaking even.
- This breakeven level correlates both with local bottoms during primary bull markets and with local tops during bear market environments.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Continued SEC And DOJ Scrutiny Spells Pressure For BNB¹ Price



ARK'S VIEW: BEARISH

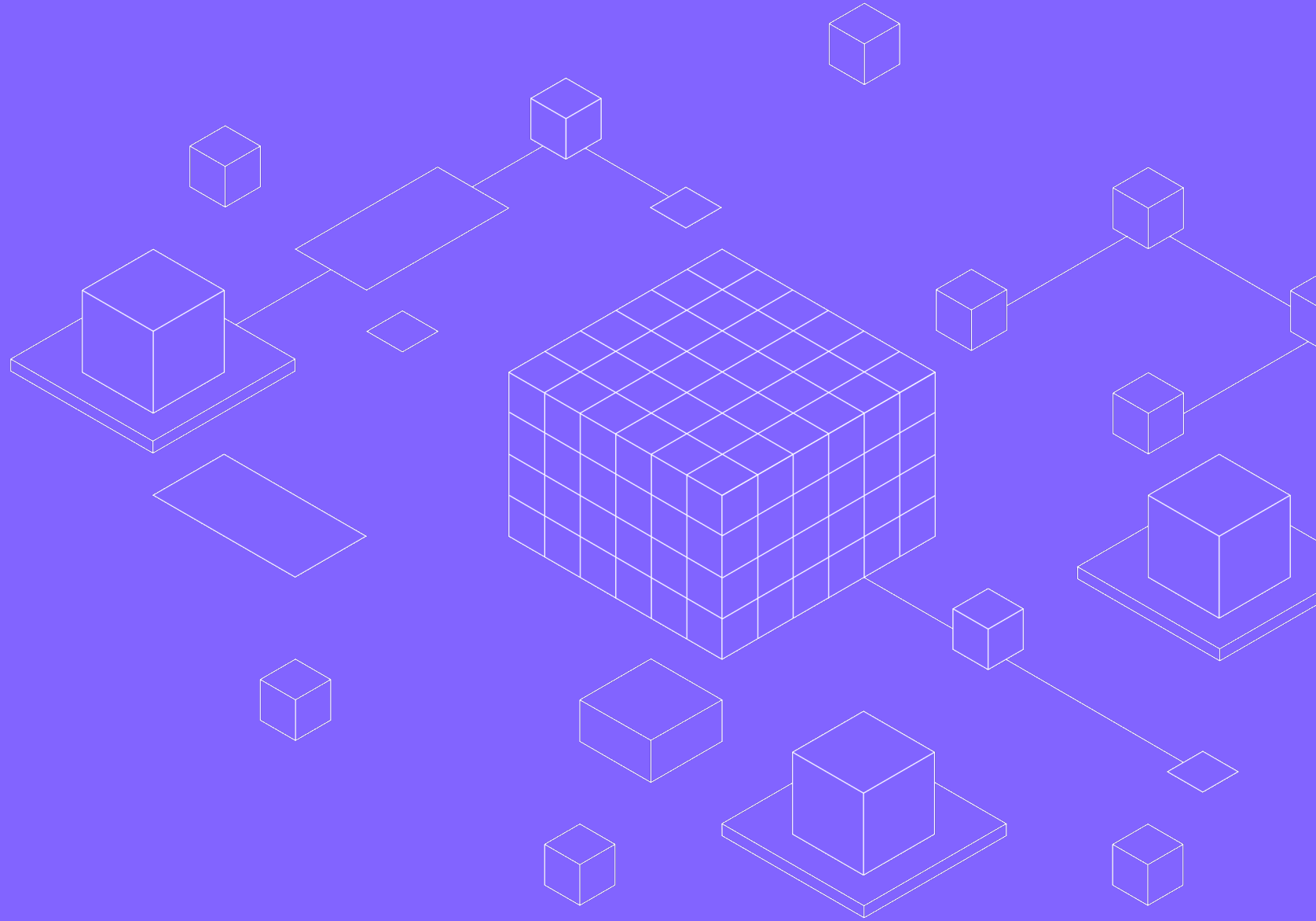
- As regulatory pressure increases on crypto exchange Binance, its native token, BNB, could be on the threshold of significant turbulence.
- Recent reports suggest that the U.S. Department of Justice (DOJ) is considering charging Binance with fraud, legitimizing the U.S. Securities and Exchange Commission (SEC's) ongoing concerns.
- Because Binance has facilitated significant liquidity in crypto, including bitcoin, BNB has become a key indicator of crypto market stability. If SEC and DOJ charges gain traction, a "bank run" could trigger the collapse of BNB.
- Currently trading near critical support at ~\$210 USD, we believe a breakdown could take it down another 80%+ to \$35 USD.

[1] BNB: Ticker for "Binance Coin"—the cryptocurrency created by the centralized exchange Binance in late 2017. Given that Binance holds over 3 billion USD of BNB in its balance sheet (5%), we believe it's a crucial indicator of the exchange's overall health. Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Section 03

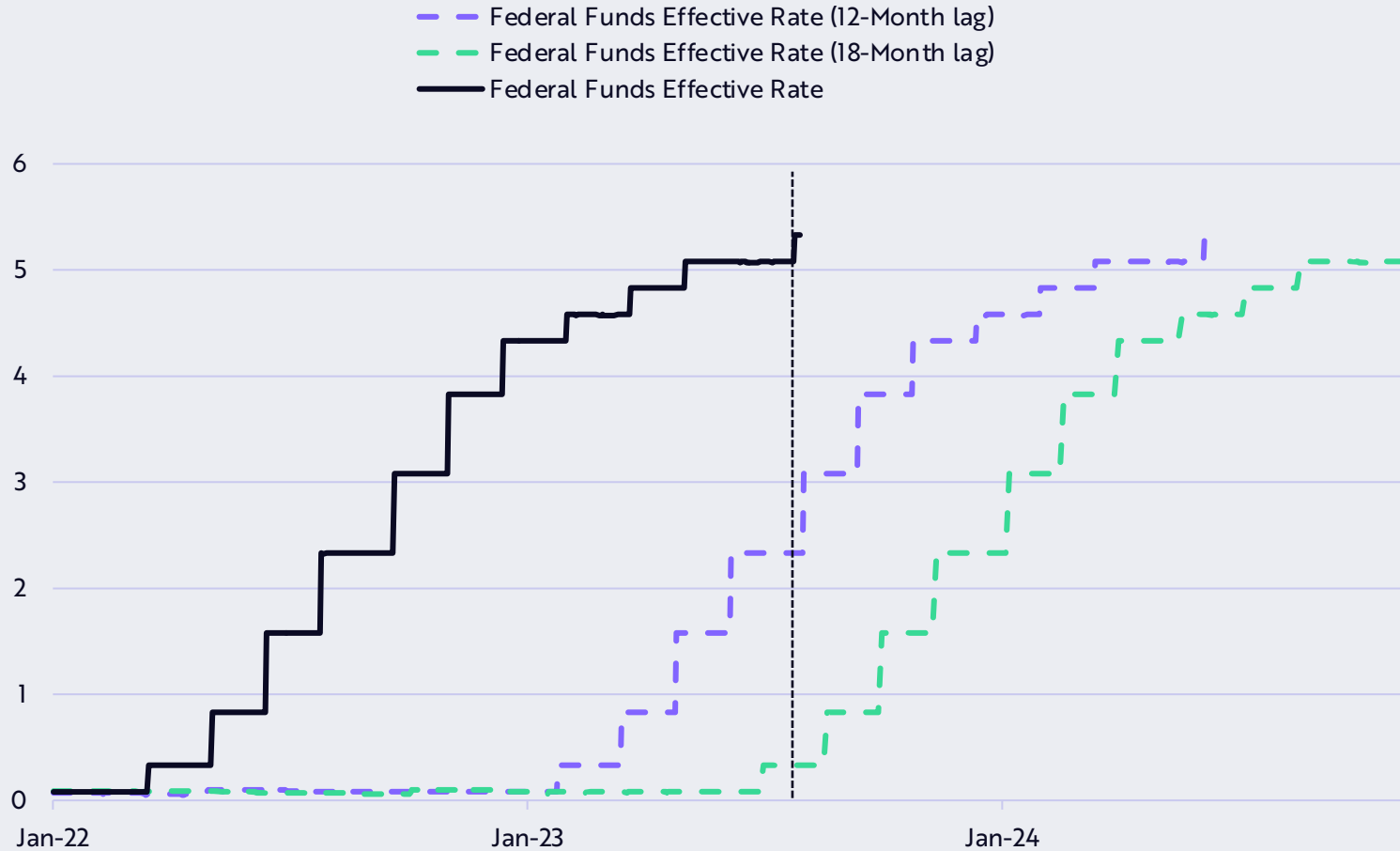
Fed Tightening: A Leading Indicator Of Price Deflation?





The Full Impact Of Fed Tightening Has Yet To Hit

Federal Funds Effective Rate: Current And Lagged



ARK'S VIEW: BEARISH

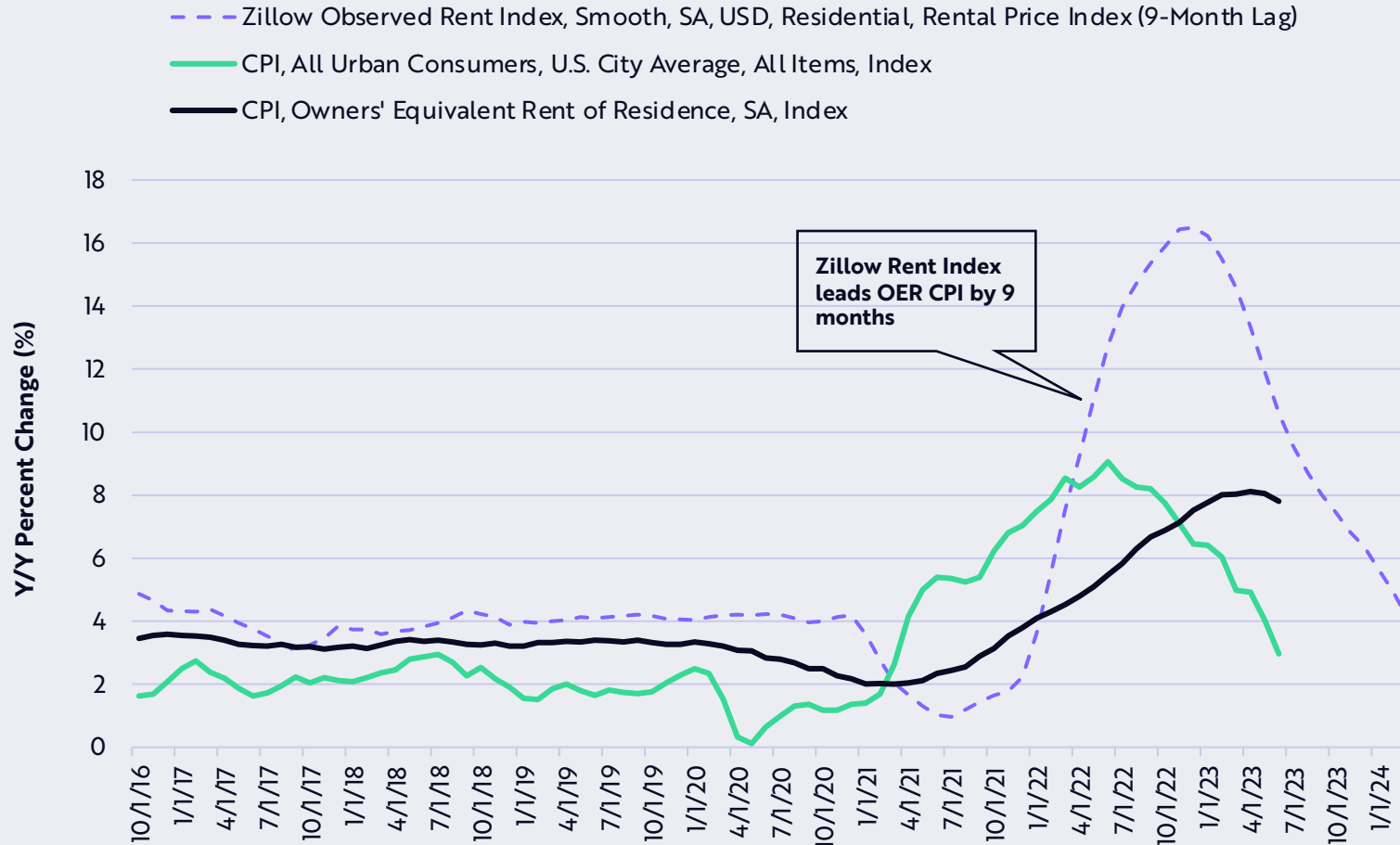
- According to renowned economist Milton Friedman, monetary policy works with “long and variable lags” that last 12-18 months, suggesting that the full impact of the Fed’s 22-fold increase in interest rates has yet to hit.
- Interest rate sensitive sectors like housing and manufacturing already are in recession. The rest of the economy could be next.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Slowing Rents Should Continue To Soften The Consumer Price Index (CPI)

Zillow Rent Index Leads Owner's Equivalent Rent CPI



ARK'S VIEW: BULLISH

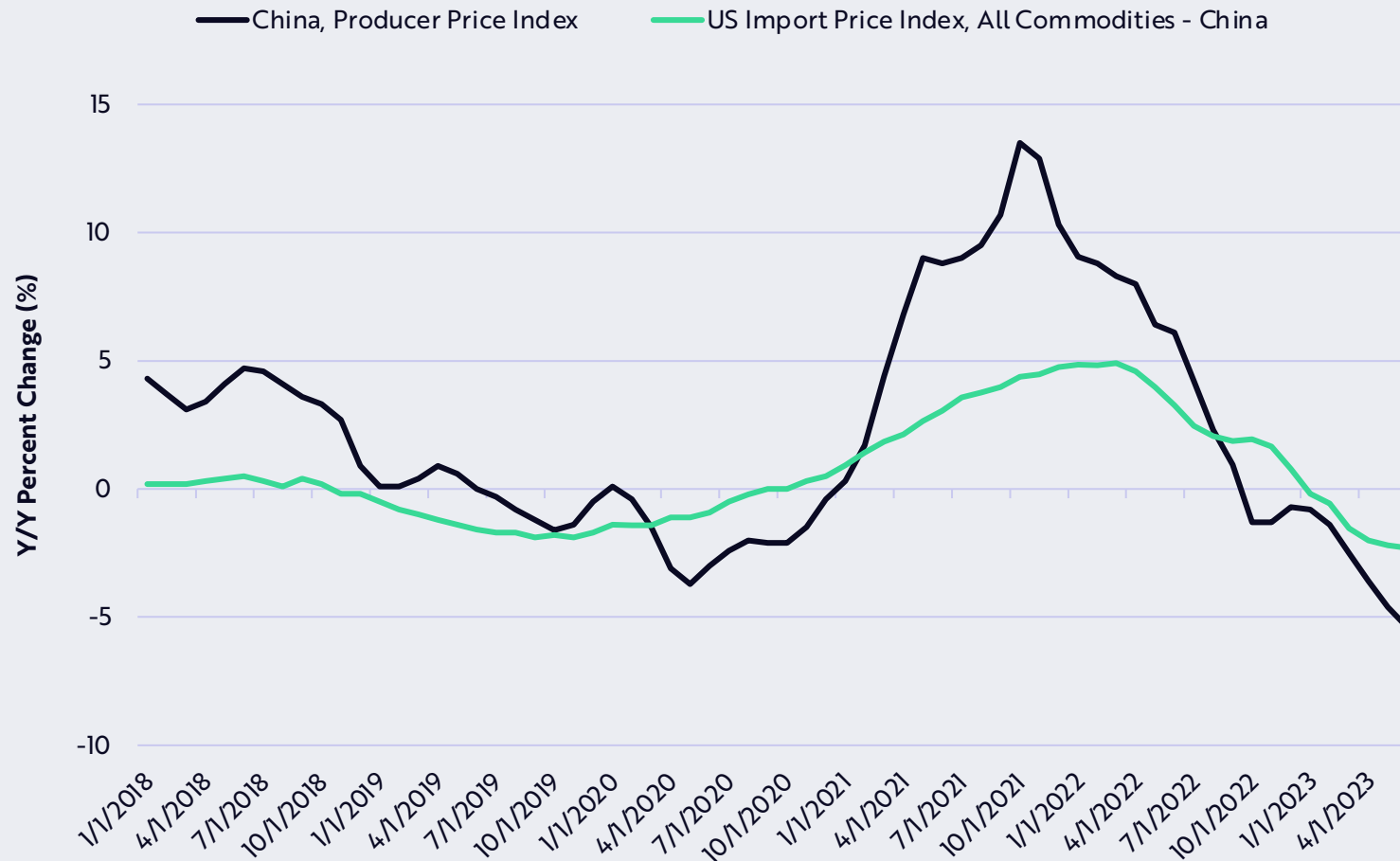
- The Zillow Rent Index, which leads the Owners' Equivalent Rent (OER) by roughly nine months, suggests that Consumer Price Index (CPI) inflation could decelerate significantly below 2% by year-end.
- Constituting 25% of the CPI, Owner's Equivalent Rent (OER) seems likely to follow the Zillow Rent Index with an inflation rate cut by more than half during the next six to nine months.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of July 31, 2023. 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. Past performance is not indicative of future results.



China, The World's Largest Exporter, Appears To Be Instigating Deflation

China is Exporting Deflation to the US



ARK'S VIEW: NEUTRAL

- China, the world's largest exporter, is experiencing deflation.
- China's PPI fell 5.4% year-over-year in the second quarter.
- US import prices from China are falling, even though the yuan has depreciated by ~12% since February 2022. All else equal, China exporters should have increased prices to offset the depreciation of the yuan. Instead, they have cut prices, harming their profitability.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of July 31, 2023. 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. Past performance is not indicative of future results.



Section 04

Appendix: Glossary Of Terms





Glossary Of Terms

Accumulation Addresses: Defined as those addresses that have received two or more economically meaningful transactions (non-dust transactions) and have never spent funds. Exchange and miner addresses are discarded. “Accumulation balance” refers to coins held in these addresses.

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.

BRC-20: A token standard that enables the minting and transaction of fungible tokens via the Ordinals protocol on the Bitcoin network.

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.

Hash Rate: The estimated computational power mining within and providing security to the Bitcoin network.

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.

Liveliness: The ratio of the sum of coindays created to the sum of coindays destroyed. Liveliness rises when old coins move and decreases when participants hold on to their bitcoin. In essence, it’s the ratio of coin movement to coin dormancy in the network.

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 remaining 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.

On-Chain: Refers to metrics or economic activity occurring on the blockchain ledger of most cryptocurrencies.

Ordinals: Refers to the creation of non-fungible tokens (NFTs) in the Bitcoin network by making Inscriptions, where metadata such as images or videos are attached to individual satoshis (the smallest unit of account).

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 (SOPR): 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 to 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.

Seller Exhaustion Constant: A metric created by ARK to measure the convergence of two market factors: high losses denoting capitulation and low volatility denoting market exhaustion.

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

Supply in Profit (Percentage): 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.

Velocity-Adjusted Cost Basis: It subtracts the cumulative dollar value of coins spent over time from the general cost basis of the market (realized price). Also known as balanced price.



For more research on disruptive innovation visit www.ark-invest.com

©2022-2026, ARK Investment Management LLC. No part of this material may be reproduced in any form, or referred to in any other publication, without the express written permission of ARK Investment Management LLC ("ARK").

Please note, companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so and/or may face political or legal attacks from competitors, industry groups, or local and national governments.

ARK aims to educate investors and to size the potential opportunity of Disruptive Innovation, noting that risks and uncertainties may impact our projections and research models. Investors should use the content presented for informational purposes only, and be aware of market risk, disruptive innovation risk, regulatory risk, and risks related to Deep Learning, Digital Wallets, Battery Technology, Autonomous Technologies, Drones, DNA Sequencing, CRISPR, Robotics, 3D Printing, Bitcoin, Blockchain Technology, etc. **Cryptocurrency Risk.** Cryptocurrencies (also referred to as "virtual currencies" and "digital currencies") are digital assets designed to act as a medium of exchange. Cryptocurrency is an emerging asset class. There are thousands of cryptocurrencies, the most well-known of which is bitcoin. Cryptocurrency generally operates without central authority (such as a bank) and is not backed by any government. Cryptocurrency is not legal tender. Federal, state and/or foreign governments may restrict the use and exchange of cryptocurrency, and regulation in the U.S. is still developing. The market price of bitcoin and other cryptocurrencies have been subject to extreme fluctuations. Similar to fiat currencies (i.e., a currency that is backed by a central bank or a national, supra-national or quasi-national organization), cryptocurrencies are susceptible to theft, loss and destruction. Cryptocurrency exchanges and other trading venues on which cryptocurrencies trade are relatively new and, in most cases, largely unregulated and may therefore be more exposed to fraud and failure than established, regulated exchanges for securities, derivatives and other currencies. Cryptocurrency exchanges may stop operating or permanently shut down due to fraud, technical glitches, hackers or malware, which may also affect the price of cryptocurrencies. **Cryptocurrency Tax Risk.** Many significant aspects of the U.S. federal income tax treatment of investments in bitcoin and other cryptocurrencies are uncertain and still evolving.

The content of this presentation is for informational purposes only and is subject to change without notice. This presentation does not constitute, either explicitly or implicitly, any provision of services or products by ARK and investors are encouraged to consult counsel and/or other investment professionals as to whether a particular investment management service is suitable for their investment needs. All statements made regarding companies or securities are strictly beliefs and points of view held by ARK and are not endorsements by ARK of any company or security or recommendations by ARK to buy, sell or hold any security. Historical results are not indications of future results. Certain of the statements contained in this presentation may be statements of future expectations and other forward-looking statements that are based on ARK's current views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. The matters discussed in this presentation may also involve risks and uncertainties described from time to time in ARK's filings with the U.S. Securities and Exchange Commission. ARK assumes no obligation to update any forward-looking information contained in this presentation. Certain information was obtained from sources that ARK believes to be reliable; however, ARK does not guarantee the accuracy or completeness of any information obtained from any third party. ARK and its clients as well as its related persons may (but do not necessarily) have financial interests in securities or issuers that are discussed.

ARK Investment Management LLC