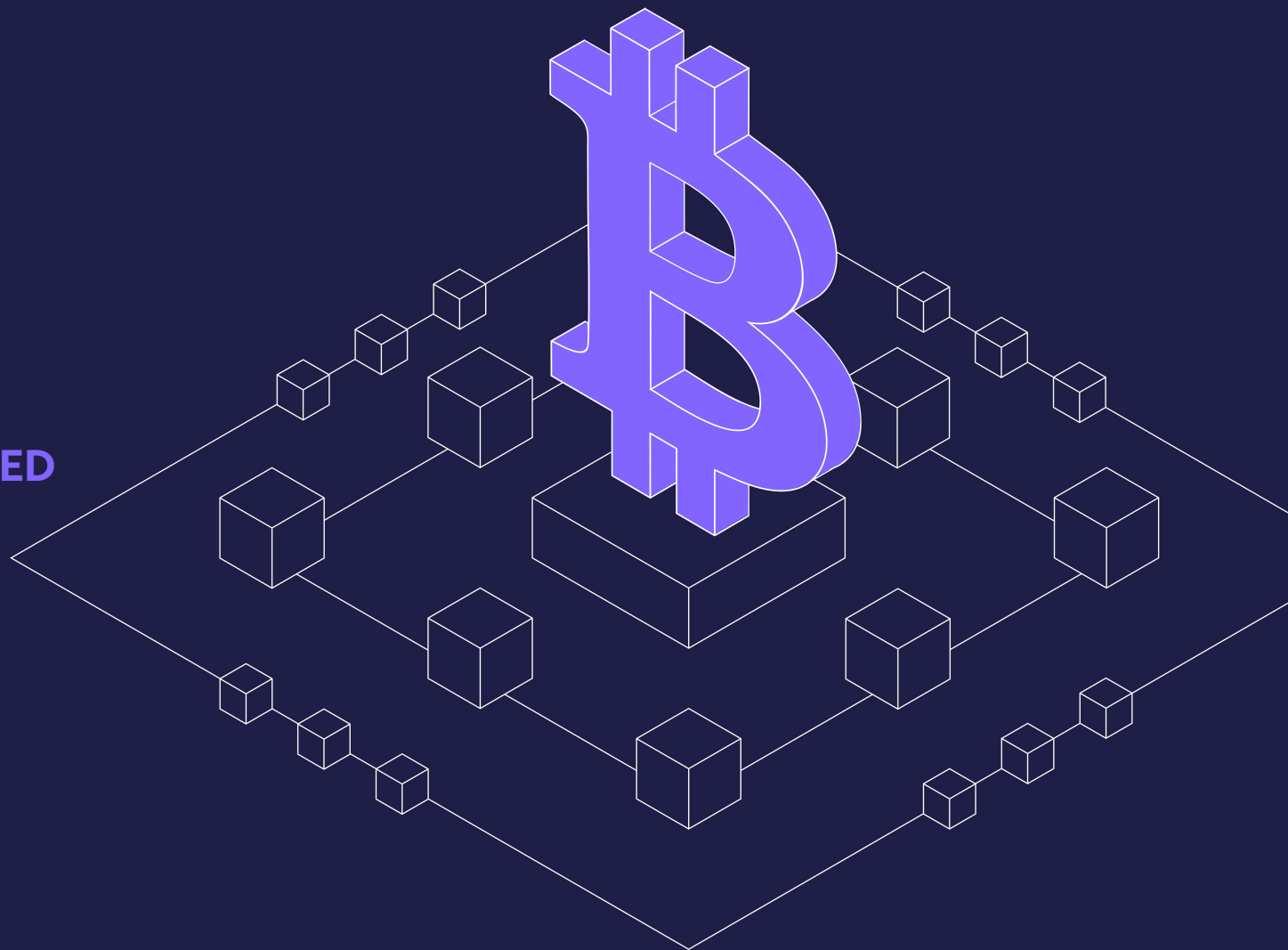




As of October 31, 2023

THE BITCOIN MONTHLY

TECHNICAL & ON-CHAIN RESISTANCE CLEARED



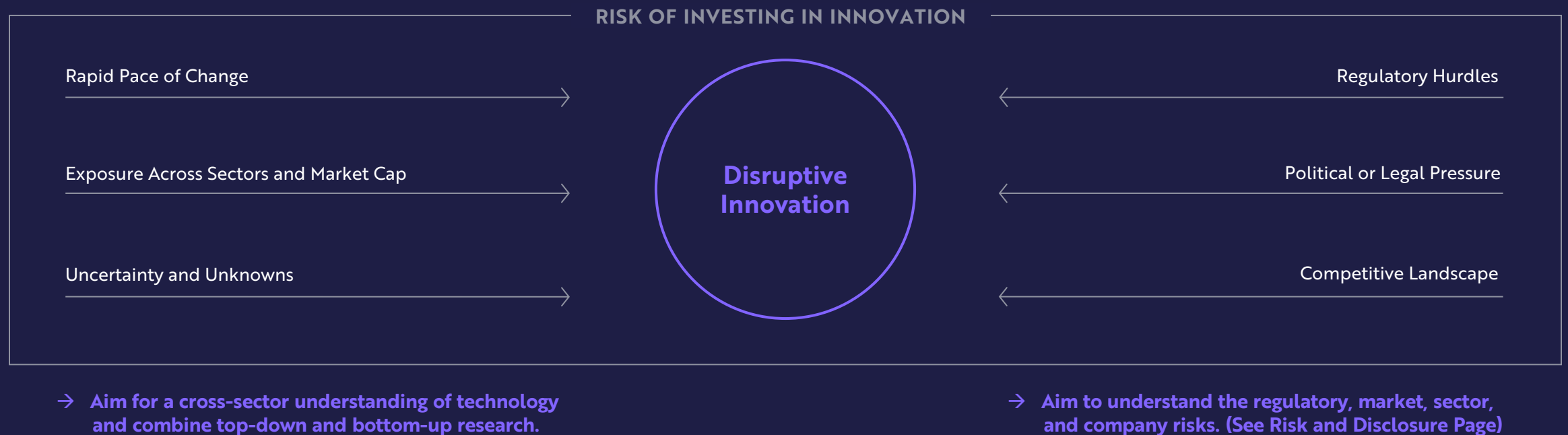
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RISKS OF INVESTING IN INNOVATION

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Please read risk disclosure carefully.





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Section 01

Market Summary





Bitcoin Has Cleared Crucial Resistance

Technical And On-Chain Resistances Have Been Cleared

- The bitcoin price increased 28.54% to \$34,656 during October, closing above its 200-week moving average (\$27,826) and the cost basis of short-term holders (\$28,757), both prices presenting significant resistance during 2023.
- The options market suggests that speculators are betting that the price of bitcoin will continue to increase.
- Both the profitability of long-term holders and the time elapsed since the low point of this cycle suggest that bitcoin's primary trend is bullish and at an early stage.

Is A Rate Reset Looming?

- Government deficit spending is clashing with tight monetary policy.
- The metals/gold ratio suggests that the 10-year Treasury yield is too high, while the Bloomberg Commodity Index has resumed the deflationary trend that began during the Global Financial Crisis.
- Despite the reported strength of US GDP, many Fortune 500 companies—including UPS and 3M—are reporting declining revenues.

ARK'S KEY TAKEAWAYS

- In October, the price of bitcoin rose 28.54% and closed above its 200-week moving average (\$27,826).
- Compared to previous cycles, bitcoin still seems to be in the early stages of a bullish primary trend.
- US fiscal policy and monetary policy are in a tug of war.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#) unless otherwise specified. Data valid as of October 31, 2023, and subject to change. For more information on certain terms, please read our Appendix: Glossary Of Terms in the Appendix 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. Past performance is not indicative of future results.



News Of The Month

[Grayscale Moves To Convert Its Ethereum Trust To A Spot ETH ETF](#)

[Firms Launch El Salvador's First Bitcoin Mining Pool Tapping Geothermal Energy](#)

[SBF's Ex-Girlfriend Caroline Ellison Takes The Stand As Government's Star Witness](#)

[Tether Promotes Paolo Ardoio To CEO Role](#)

[SEC Does Not Plan To Appeal Court Decision On Grayscale Bitcoin ETF](#)

[BlackRock Says Application For Spot Bitcoin ETF Is Still Under Review By SEC Despite Rumors On Social Media](#)

[SEC Chair Gensler Says Agency Staff "Doing Work" On Multiple Bitcoin ETF Filings](#)

[US Treasury Plans To Designate International Crypto Mixers As Money-Laundering Hubs](#)

[Tether Aims To Publish Reserve Data In Real-Time In Coming Years](#)

[Sam Bankman-Fried Grilled By Prosecutor, Who Points Out Contradictions in His Testimony](#)



Transaction Volume Has Been Gaining Momentum On The Bitcoin Network

	Bitcoin Metrics ¹	Unit	October 2023	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	268.2	+9.3%	+69.5%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	\$33.1	+33.2%	+74%	Bullish	No Change
Network Usage	<u>Active Owners</u> ² (Active Entities, 7-Day Moving Average)	Thousands	284.4	+2.1%	+12.1%	Bullish	No Change
	<u>Transaction Volume</u> ² (7-Day Moving Average)	BTC (Thousands)	137.3	+19.3%	-20.6%	Neutral	↑
Holder Behavior	<u>Long-Term-Holder Supply</u> ² (Coins Held for 155 Days+)	BTC (Millions)	14.86	+0.2%	+6.8%	Bullish	No Change
	<u>Locked Supply</u> ² (Illiquid Supply)	BTC (Millions)	15.34	+0.4%	+6%	Bullish	No Change
	<u>Time-Weighted Turnover</u> ² (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	11.62	+73%	+46.1%	Bearish	↓

[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms in the Appendix 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 [Glassnode](#). Some data may be subject to change over time since they are entity-adjusted in real time. Information as of October 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.

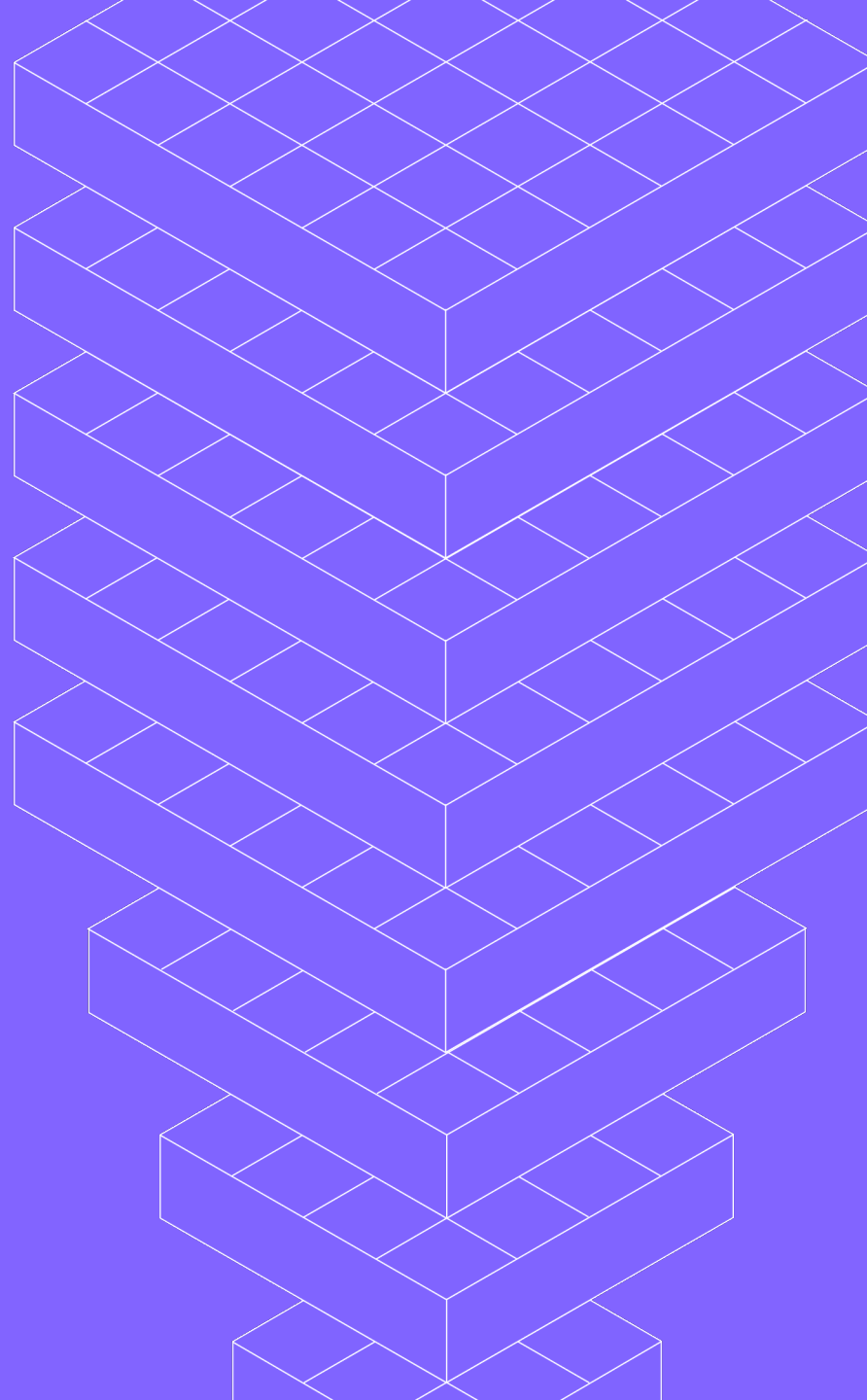


Bitcoin's Cost Basis Has Grown As The Perpetual Futures Market Overheats

	Bitcoin Metrics ¹	Unit	October 2023	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$20,602	+1.5%	-2.3%	Bullish	↑
	<u>Percent Supply In Profit</u>	pp	83.9%	+17.4 pp	+25.1 pp	Bullish	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$28,756	+3.4%	+35.8%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	11.34	+11.34 pp	+14.25 pp	Bullish	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated, 7-Day Exponential Moving Average)	pp	0.02%	+0.07 pp	+0.07 pp	Neutral	↓
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	6.22%	+2.53 pp	+4.66 pp	Bullish	No Change

[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms in the Appendix 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 [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 October 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.

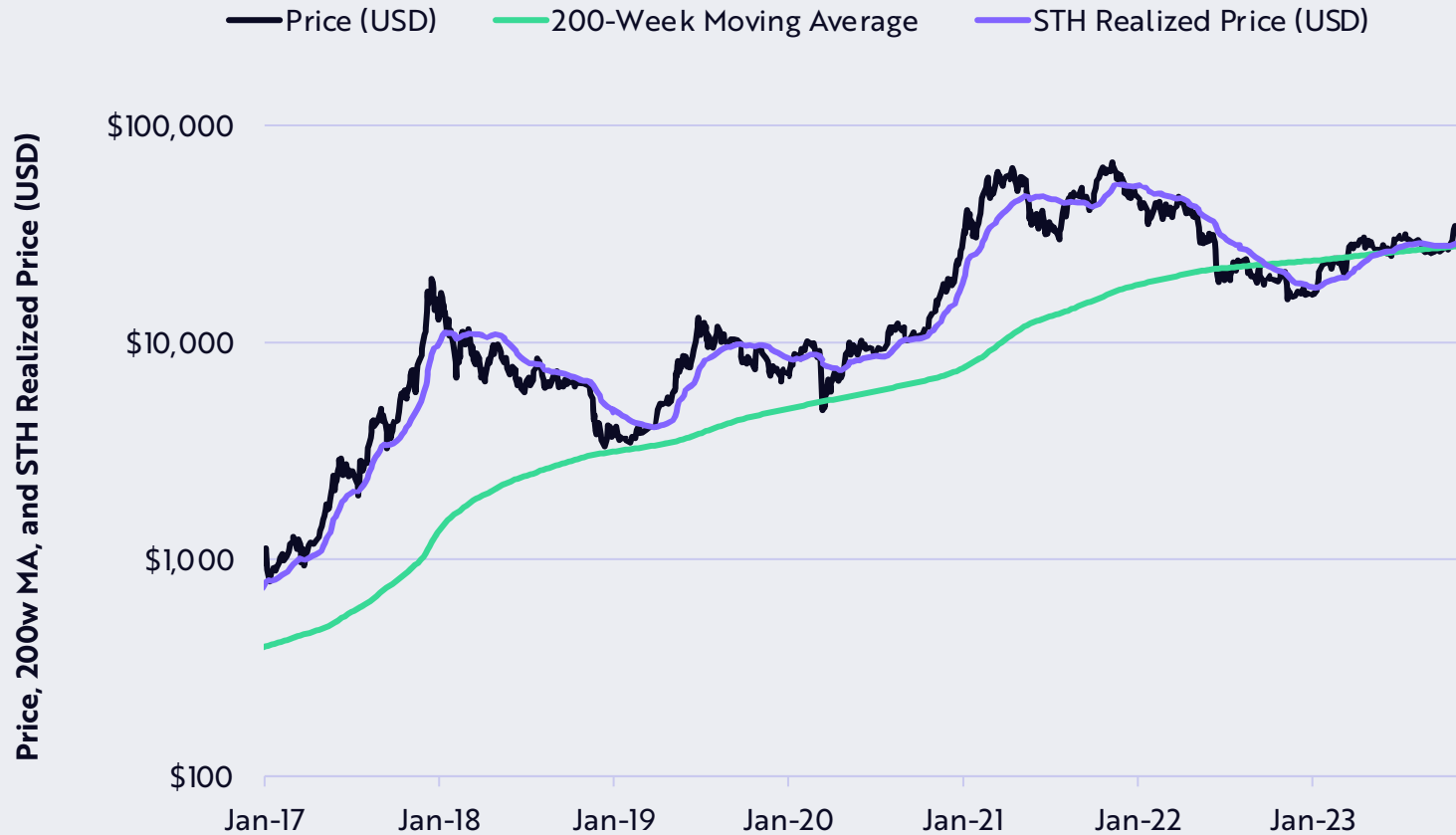
Technical And On-Chain Resistance Cleared





Bitcoin Cleared Important Resistance In October

Bitcoin 200-Week Moving Average and Short-Term-Holder Cost Basis



ARK'S VIEW: BULLISH

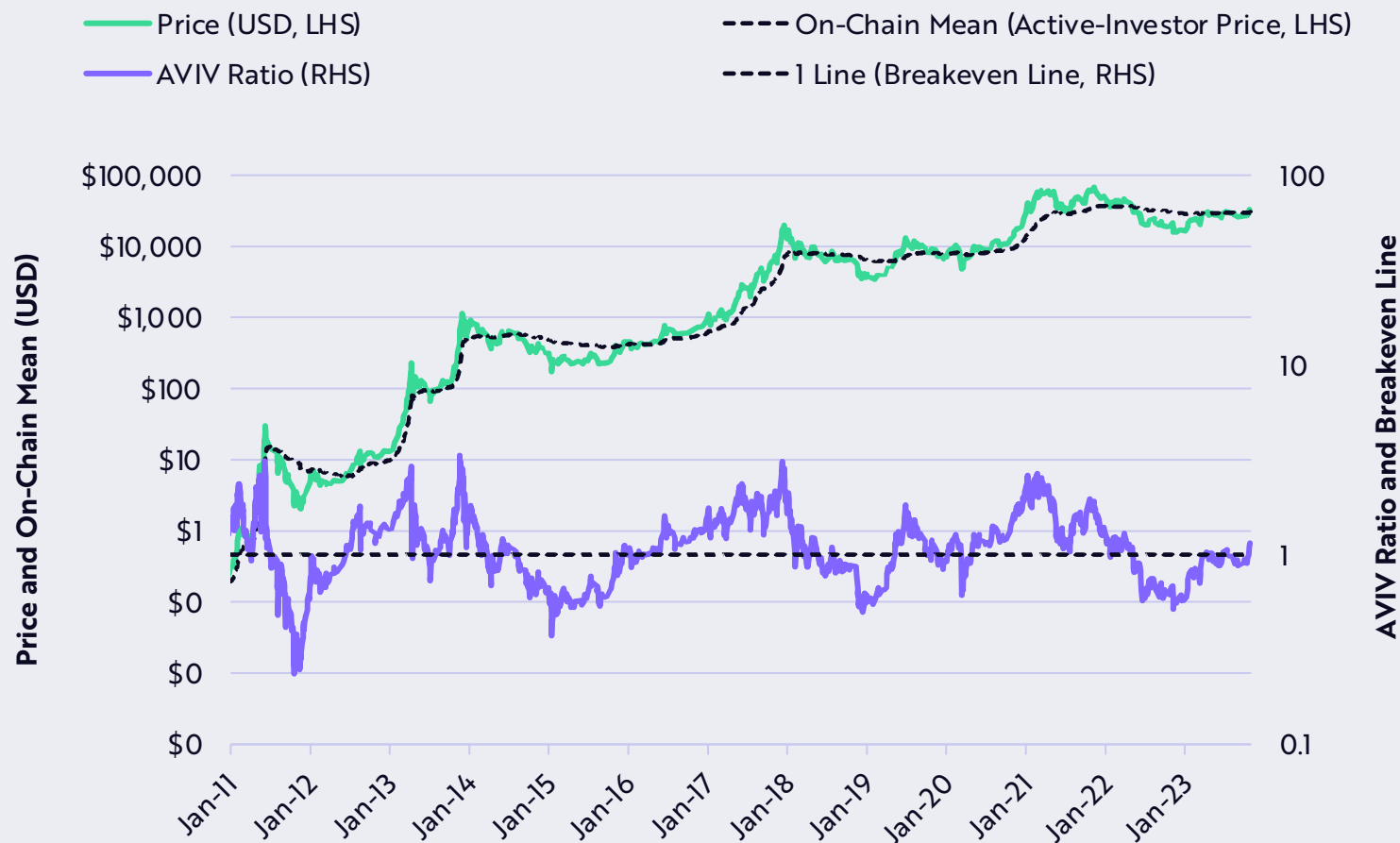
- The bitcoin price increased 28.54% to \$34,656 during the month of October.
- Bitcoin battled and surpassed a cluster of technical and on-chain resistance throughout 2023—the 200-week moving average (\$27,826) and short-term-holder cost basis (\$28,757), respectively.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of October 31, 2023. Data may be subject to change over time since they are 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. Past performance is not indicative of future results.



Bitcoin's AVIV Is At Its Highest Level Since April 2022

Bitcoin On-Chain Mean and AVIV Ratio



ARK'S VIEW: BULLISH

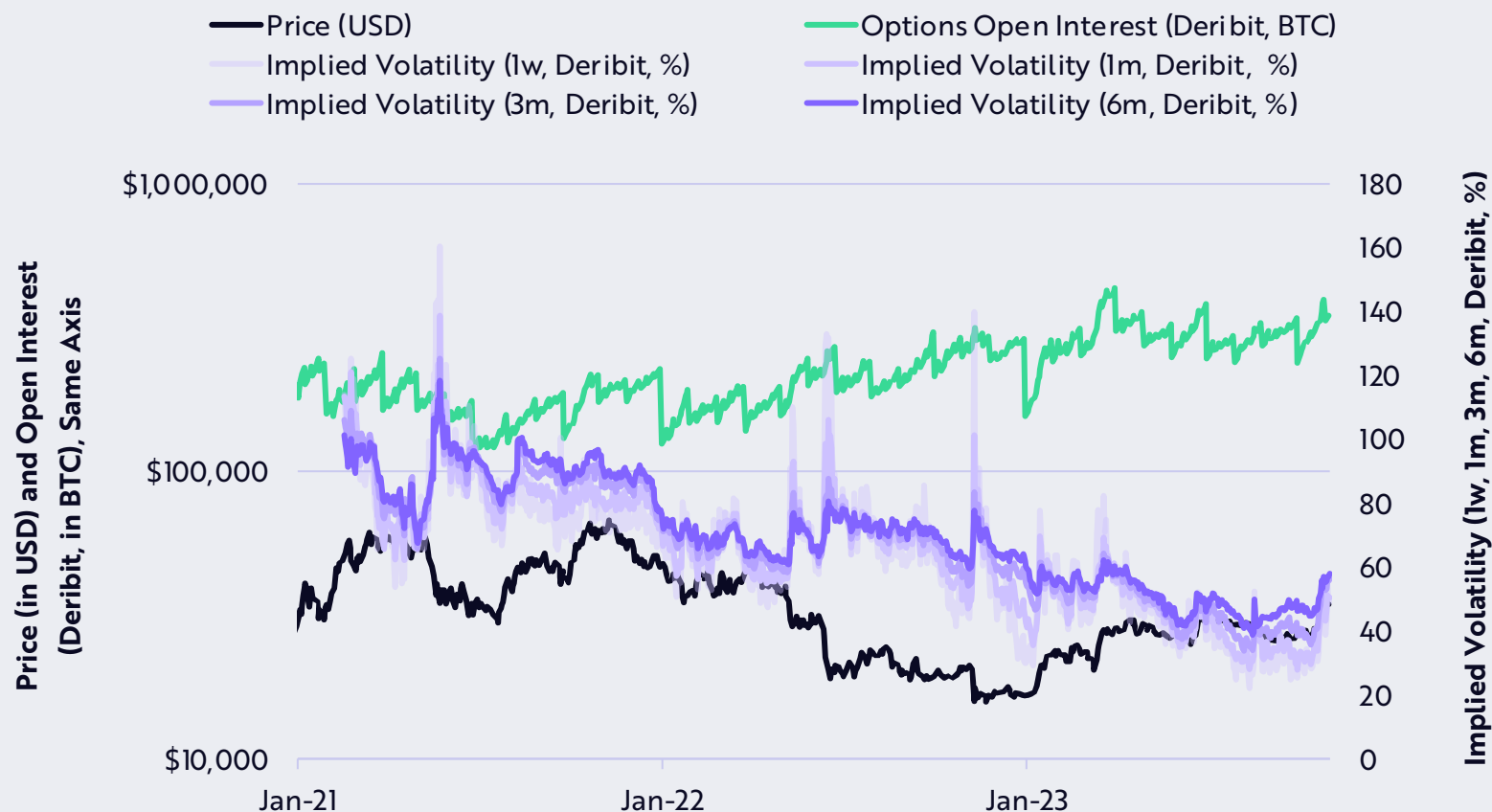
- During October, the Active-Value-to-Investor-Value (AVIV) Ratio reached 1.148, its highest level since April 2022.
- The AVIV Ratio divides the active capitalization of bitcoin (supply moved) by the cost basis of the investor cohort. When AVIV equals 1, these investors in the secondary market are at breakeven levels.
- An AVIV this far above 1 suggests that unrealized profits are at meaningful levels for the first time since the start of the crypto bear market in 2022.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of October 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.



Expectations Of Continued Low Volatility Drove Bitcoin's Open Interest To Its Highest Level Since March

Bitcoin Options Open Interest and Implied Volatility (Deribit)



ARK'S VIEW: NEUTRAL

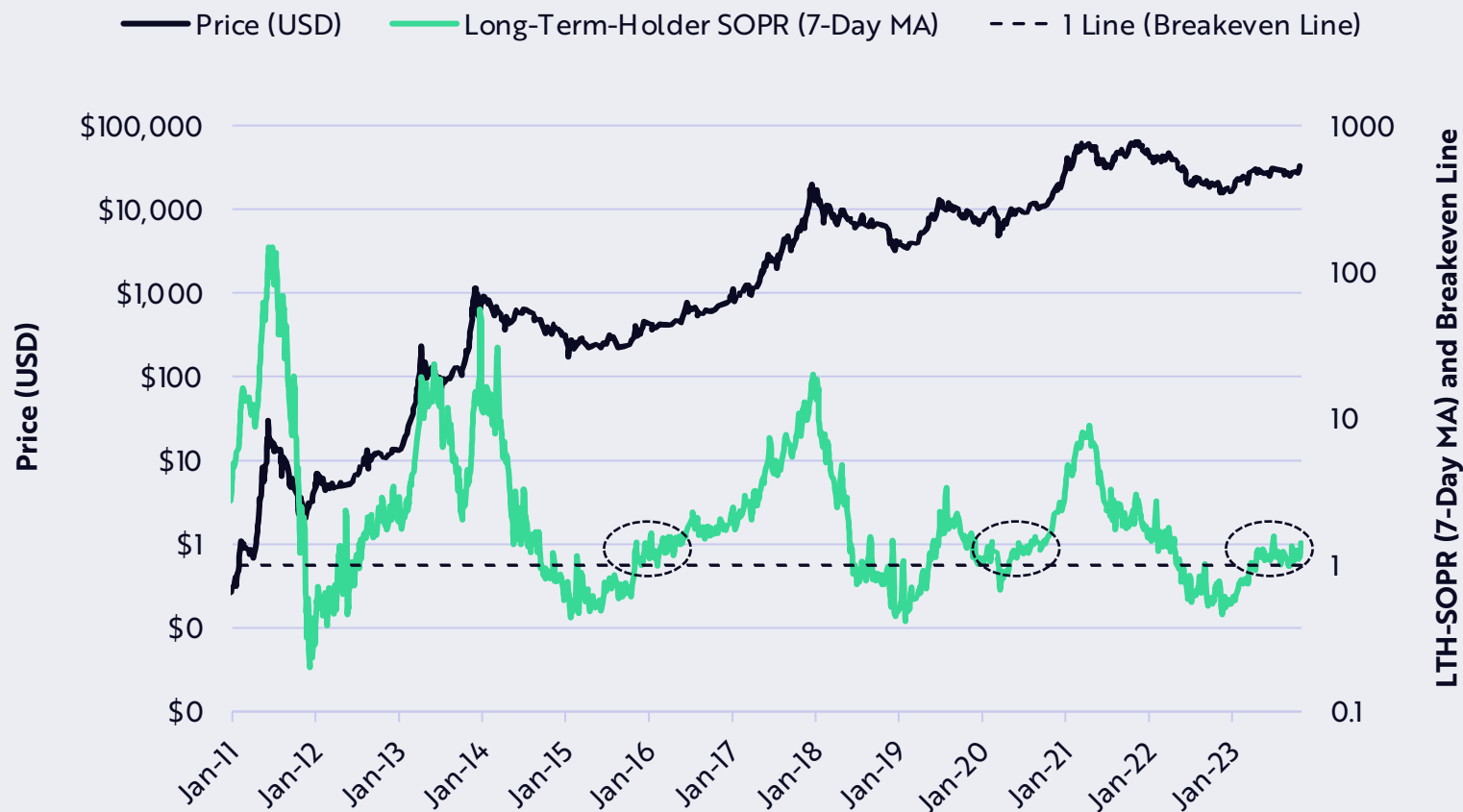
- Open interest in BTC options began to rise at the beginning of the crypto winter in 2021. In the process, both implied and realized volatility began to decline.
- After dropping from ~85% in April 2021 to ~43% in October 2023, the put/call ratio suggests that speculators are betting on a bull market in the first half of 2024.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of October 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.



Long-Term Holder Realized Returns Suggest That Bitcoin Has Entered A Risk-On Environment

Bitcoin Long-Term-Holder SOPR



ARK'S VIEW: BULLISH

- After experiencing realized losses for ~10 months, long-term holders entered a period of realized profits in March 2023.
- Consolidating slightly above 1, or at breakeven, the SOPR suggests that the bullish primary trend in bitcoin's price is in early stages.
- "SOPR"—spent output ratio, also known as Realized Returns—is the ratio of price sold to price bought for the coins that move on any given day. This chart includes only long-term-holder supply—comprising coins moved during the last 155+ days.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of October 31, 2023. Data may be subject to change over time since they are 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. Past performance is not indicative of future results.



Bitcoin's Primary Trend Seems Be At An Early Stage

Bitcoin Market Cycles (Trough to Trough)



ARK'S VIEW: BULLISH

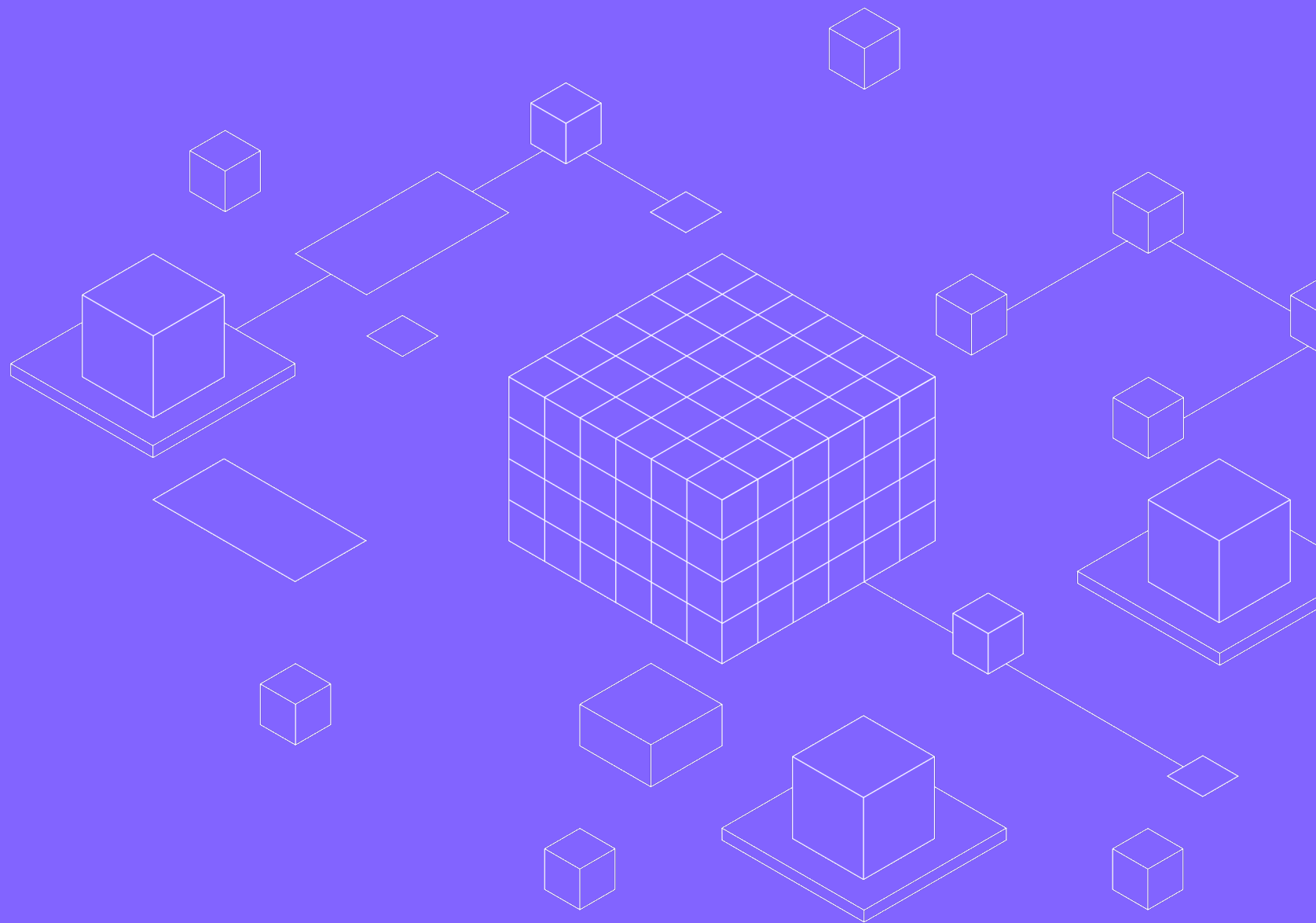
- This chart showcases every major bitcoin cycle since 2011, fitting every cycle low to the current cycle low in late 2022.
- Depicted in the black line, the current cycle began on November 21, 2022. Compared to previous cycles, the current bull market seems to be at an early stage.
- In previous cycles, the bitcoin price topped 2-3 years after its cyclical low.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of October 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

Interest Rate Reset Now?





Fiscal And Monetary Policy Are In A Tug Of War

US Treasury Federal Budget Deficit Or Surplus As A % Of Nominal GDP



ARK'S VIEW: NEUTRAL

- Deficit spending is expansionary fiscal policy that is flying in the face of contractionary monetary policy.
- While they have dominated fiscal policy conditions since 1968, the size of the current deficit relative to GDP typically has been associated with the contracyclical spending necessary during recessions.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of October 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.



Fiscal And Monetary Policy Are In A Tug Of War

Year-Over-Year US M2¹ Growth



[1] M2: The U.S. Federal Reserve's estimate of total money supply, including all cash on hand plus all money deposited in checking and savings accounts, as well as other short-term saving vehicles like certificates of deposit (CDs). Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of October 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.

ARK'S VIEW: BEARISH

- On a year-over-year basis, the growth in M2¹ money supply has contracted to levels not seen since the Great Depression.
- The contraction in M2 has caused rolling recessions, starting in housing and autos, that we believe will hit other sectors during the next year.



Commodity Prices Have Been In A Deflationary Trend Since 2008

Bloomberg Commodity Index



ARK'S VIEW: BULLISH

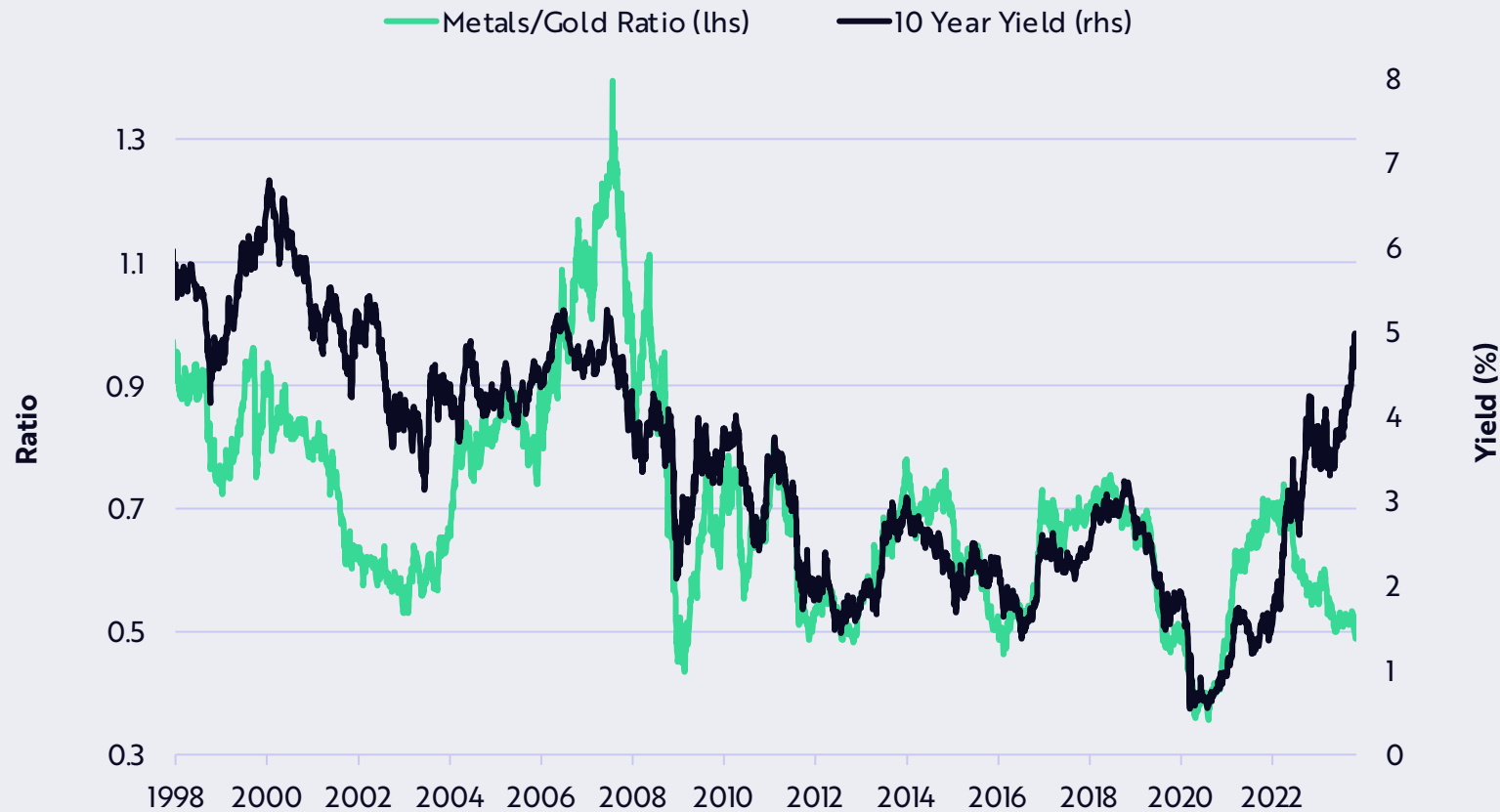
- As measured by the Bloomberg Commodity Price Index, commodity prices first hit current levels more than 40 years ago and have been in a deflationary trend since 2008.
- Focused on years of near-zero percent interest rates, many investors seem to be betting that inflation and interest rates will remain higher for longer. This chart flies in the face of "higher for longer" inflation forecasts.
- If deflation is the bigger risk today, as we believe, pricing power will diminish, if not disappear. Instead of fueling inflation, steep wage hikes will slam margins.

Source: ARK Investment Management LLC, 2023. Chart data from Bloomberg. Information as of October 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.



The Metals-to-Gold Ratio Suggests That Treasury Yields Are Excessive

Metals/Gold Ratio vs 10 Year US Treasury Yield



ARK'S VIEW: BULLISH

- The metals/gold ratio indicates that the 10-year Treasury yield is out of line.
- A declining metals/gold ratio indicates that gold's purchasing power is increasing, suggesting that inflation is likely to diminish.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of October 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.



Government Statistics Do Not Seem To Be Capturing How Weak The Economy Is

UPS US Domestic Average Daily Volume Year-Over-Year Change



ARK'S VIEW: BEARISH

- Many companies are reporting shockingly weak revenues despite strong GDP results.
- UPS's US delivery volume growth is worse today than in 2007-2009.
- Another economic bellwether, 3M reported that global organic sales dropped more than 3% year-over-year on a local currency basis last quarter.
- Strong US employment is attributed to labor hoarding. If prices collapse and hurt profit margins, companies will be forced not only to lay off excess labor but also to harness AI and other automation to salvage margins.

Source: ARK Investment Management LLC, 2023. Chart data from UPS earnings calls (2005-2023). Information as of October 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.

Consumer Price Index (CPI): Measurement that tracks how the average price of a basket of consumer goods and services changes over time. It's often used to calculate inflation.

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.

Federal Funds Policy Rate: This is the interest rate at which banks lend money to each other overnight. It's set by a country's central bank (like the Federal Reserve in the U.S.) and influences other interest rates throughout the economy.

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

Gross Domestic Income (GDI): This is the total income earned by a country's residents and businesses, including wages, profits, and taxes minus subsidies. It's a way to measure the economic health of a country, much like GDP.

Gross Domestic Product (GDP): This is the total value of all goods and services produced in a country over a certain period of time, usually a year. It's another way to measure a country's economic performance.

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.

Natural Rate of Interest: Theoretical interest rate that at which the economy is neither expanding nor contracting.

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.

On-Chain Mean: Developed collaboratively by ARK Invest and Glassnode, on-chain mean is calculated by dividing the cost basis capitalization of investors—the secondary market of the Bitcoin network—by the number of active coins in the network based on their aggregate time of dormancy proportional to total supply. Also known as "active-investor price" or "true market mean."



Glossary Of Terms, continued

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 is (the smallest unit of account).



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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.

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