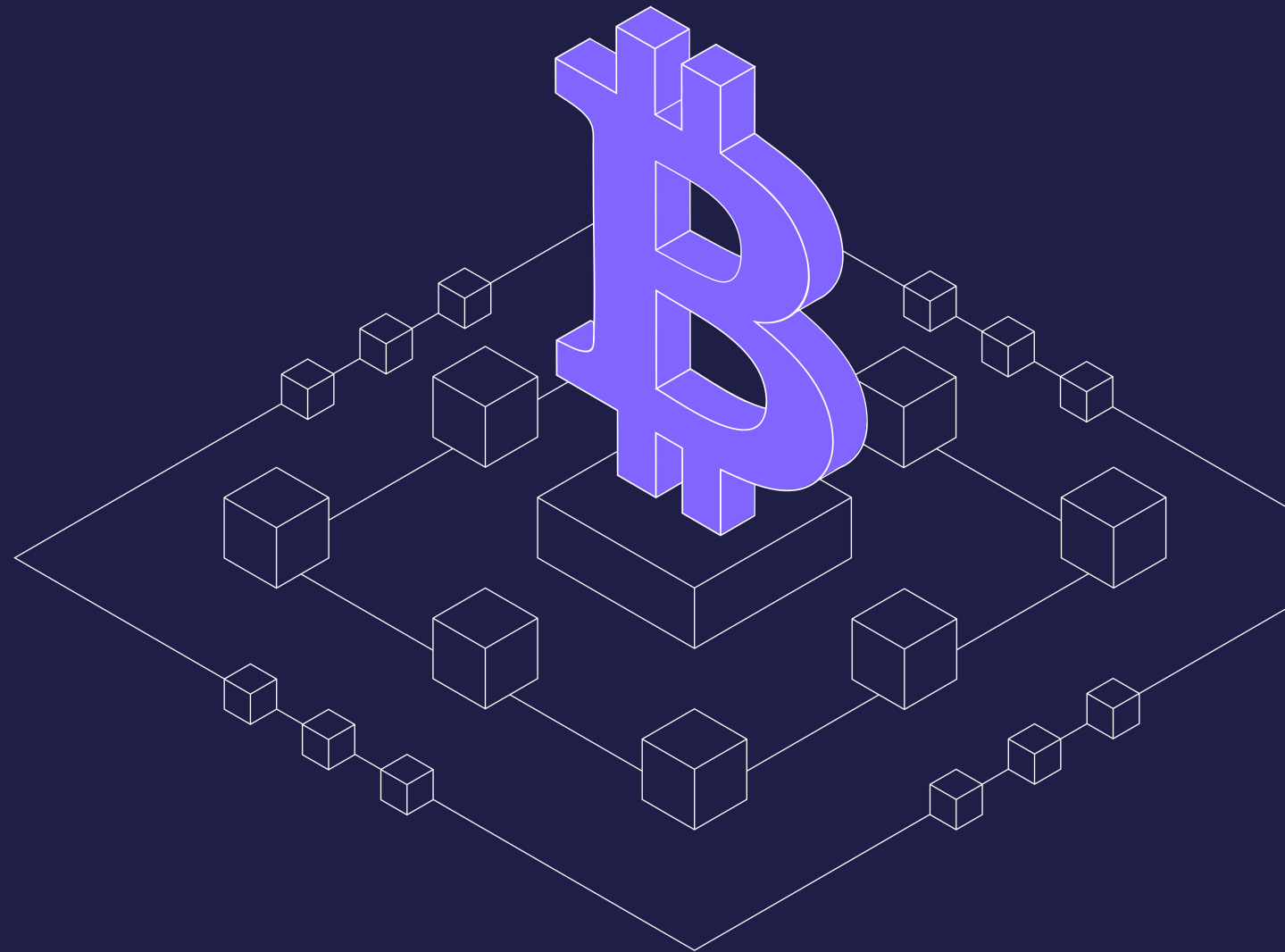


November 2024

THE BITCOIN MONTHLY

POST-ELECTION ALL-TIME HIGHS



For Informational Purposes Only. ARK Investment Management LLC, 2024 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.**



Important Information Regarding Bitcoin

Bitcoin is a relatively new asset class, and the market for bitcoin is subject to rapid changes and uncertainty. Bitcoin is largely unregulated and bitcoin investments may be more susceptible to fraud and manipulation than more regulated investments. Bitcoin is subject to unique and substantial risks, including significant price volatility and lack of liquidity, and theft.

Bitcoin is subject to rapid price swings, including as a result of actions and statements by influencers and the media, changes in the supply of and demand for bitcoin, and other factors. There is no assurance that bitcoin will maintain its value over the long term.

ARK strongly encourages any investor considering an investment in bitcoin or any other digital asset to consult with a financial professional before investing. All statements made regarding bitcoin are strictly beliefs and points of view held by ARK and are not recommendations by ARK to buy, sell or hold bitcoin. Historical results are not indications of future results.



SECTIONS

01

Market Summary

02

Bitcoin Is In Uncharted Territory

03

Optimism Overshadows Economic Imbalances

04

Appendix: Glossary Of Terms



Section 01

Market Summary





Post-Election, Bitcoin Breaks Its All-Time High

Bitcoin Is In Uncharted Territory

- During November, bitcoin's price increased 37.4% to \$96,514, its highest monthly percentage increase since last February.
- After surpassing its all-time high the day after the US Presidential election, bitcoin increased to \$99,860 at one point during November.
- ARK's AVIV deviation band model is pointing to a bitcoin price target of \$129,000 by the end of this bullish cycle, if upward momentum continues in 2025.
- While bitcoin's sell-side risk ratio¹ and Fear & Greed Index² suggest mild-to-medium overbought conditions, in our view momentum could propel further price increases.

Optimism Overshadows Economic Imbalances

- An increase in the bitcoin-to-gold price ratio is consistent with a risk-on sentiment.
- Business sentiment seems to be bottoming after the election, after noncorporate firms have faced unprecedented pressure on net income relative to larger corporations.

ARK'S KEY TAKEAWAYS

- During November, bitcoin's price increased 37.4% to \$96,514.
- After breaking its all-time high the day after the US Presidential election, the price of bitcoin hit \$99,860 during November.
- Bitcoin's AVIV bands still are pointing to higher price levels at \$129,000, despite other models indicating overbought conditions.
- Risk-on assets and new orders signal optimism, despite structural economic disparities.

[1] For more information on the sell-side risk ratio and its calculation, please read slide 13 of this report.

[2] For more information on the Fear & Greed Index, please read slide 14 of this report.

Source: ARK Investment Management LLC, 2024. Data from Glassnode unless otherwise specified. Data valid as of November 30, 2024, and subject to change. For more information on certain terms, please read our 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

[First UK Pension Fund Invests in Bitcoin](#)

[Pennsylvania Passes Bitcoin Rights Bill, Proposes Strategic Reserve](#)

[18 States Sue SEC Over 'Unconstitutional Overreach' Of Digital Assets](#)

[Bitcoin ETF Options Begin Trading](#)

[Trump's Social Media Company In Talks To Buy Crypto Firm Bakkt](#)

[Russia Proposes 15% Tax On Crypto Income From Trading And Mining](#)

[Trump Said to Consider Crypto Lawyer Teresa Goody Guillén to Lead SEC](#)

[SEC Chair Gary Gensler to Step Down as Trump Signals Pro-Crypto Agenda](#)

[MicroStrategy Completes \\$3 Billion Offering of Convertible Senior Notes Due 2029 at 0%](#)

[Trump Admin Eyes CFTC to Lead Digital Asset Regulation](#)

[Fifth Circuit Rejects OFAC's Tornado Cash Sanctions](#)



Except For Increased Selling Pressure From Long-Term Holders, On-Chain Health Remains Unchanged

	Bitcoin Metrics ¹	Unit	November 2024	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	439.3	+6.91%	+50.51%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	44.03	+22.42%	+17.4%	Bullish	No Change
Network Usage	<u>Active Owners</u> ² (Active Entities, 7-Day Moving Average)	Thousands	241.1	+13.68%	-7.74%	Neutral	No Change
	<u>Transaction Volume</u> ² (7-Day Moving Average)	BTC (Thousands)	151.1	+14.25%	+28.11%	Bullish	No Change
Holder Behavior	<u>Long-Term-Holder Supply</u> ² (Coins Held for 155 Days+)	BTC (Millions)	13.6	-2.85%	-4.5%	Bearish	No Change
	<u>Locked Supply</u> ² (Illiquid Supply)	BTC (Millions)	14.7	+1.2%	+2.76%	Bullish	No Change
	<u>Time-Weighted Turnover</u> ² (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	18.09	+51.83%	+79.85%	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, 2024. Data sourced from Glassnode. Some data may be subject to change over time since they are entity-adjusted in real time. Information as of November 30, 2024. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency.

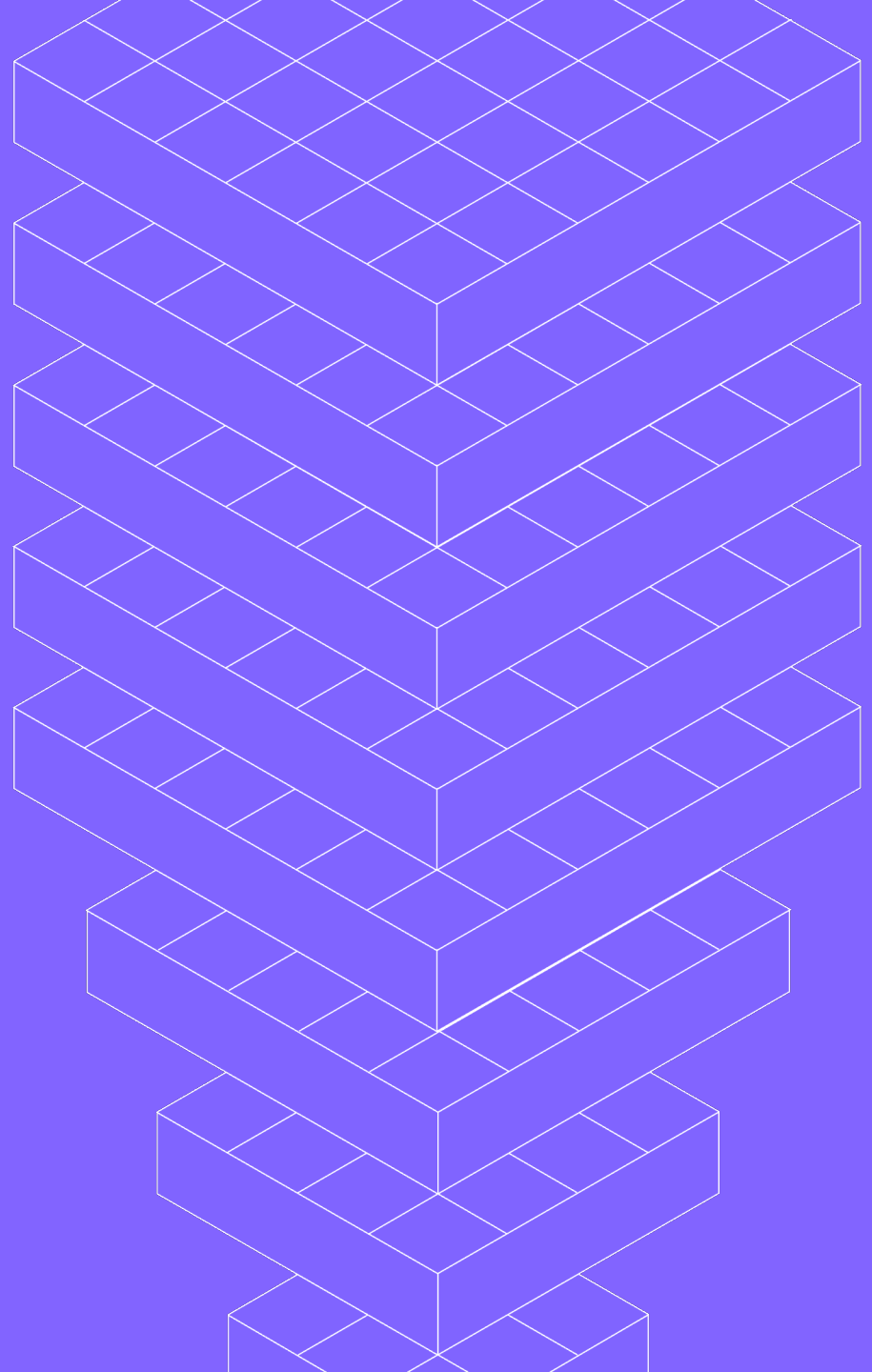


On-Chain Cost Bases Suggest Healthy Upward Momentum Despite Overheated Derivatives Markets

	Bitcoin Metrics ¹	Unit	November 2024	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$37,019	+11.93%	+75.33%	Bullish	No Change
	<u>Percent Supply In Profit</u>	pp	95.5	-0.21	+9.91	Neutral	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$77,033	+19.86	+139.03%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-Day Moving Average)	pp	18.4	+9.54	+8.65	Neutral	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated)	pp	0.07	+0.03	+0.1	Bearish	↓
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	15.8	+4.71	+5.67	Neutral	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, 2024. 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 November 30, 2024. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security or cryptocurrency.

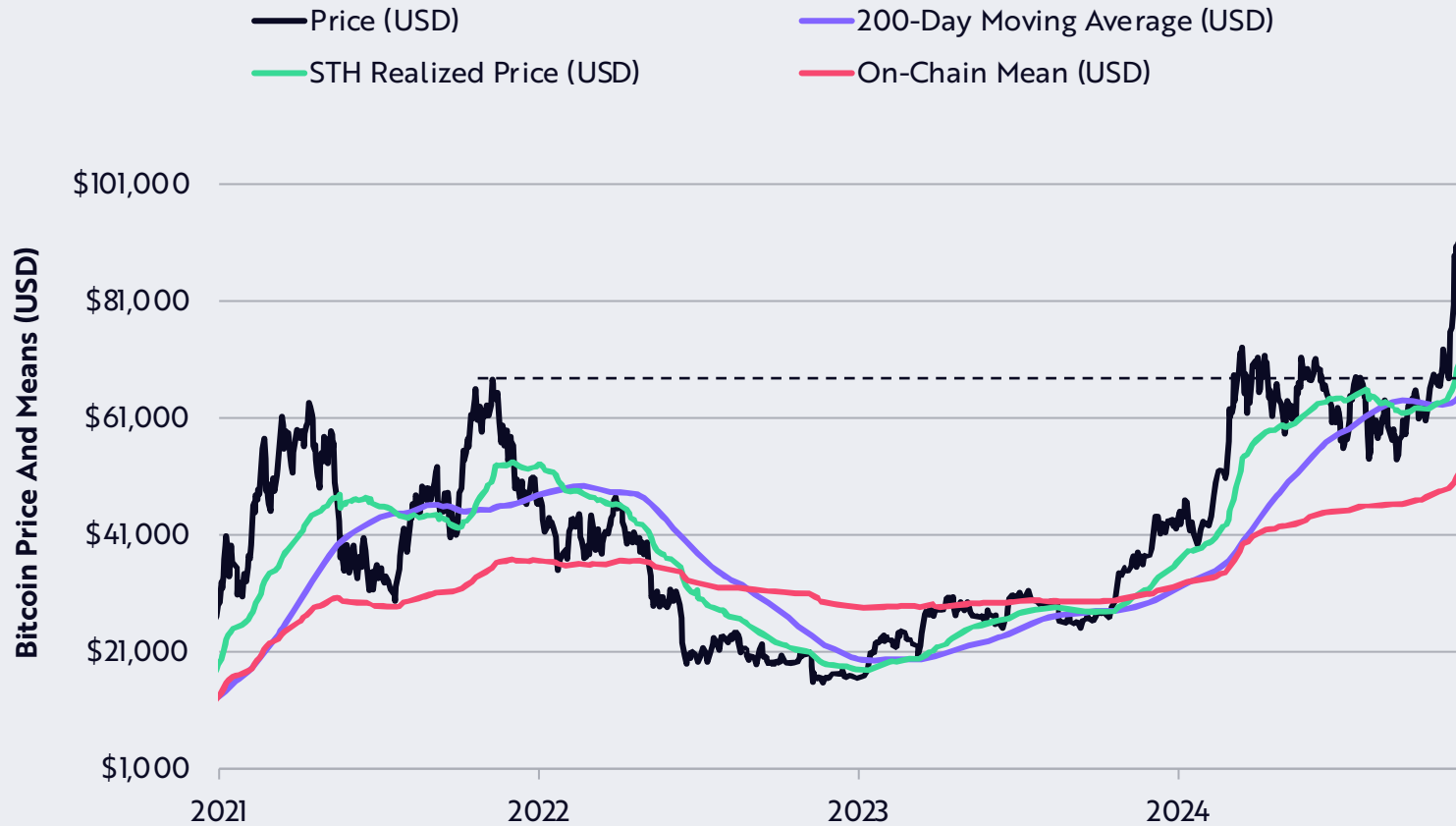
Bitcoin Is In Uncharted Territory





After Breaking Its All-Time High, Bitcoin Has Entered Uncharted Territory

Bitcoin Means



ARK'S VIEW: BULLISH

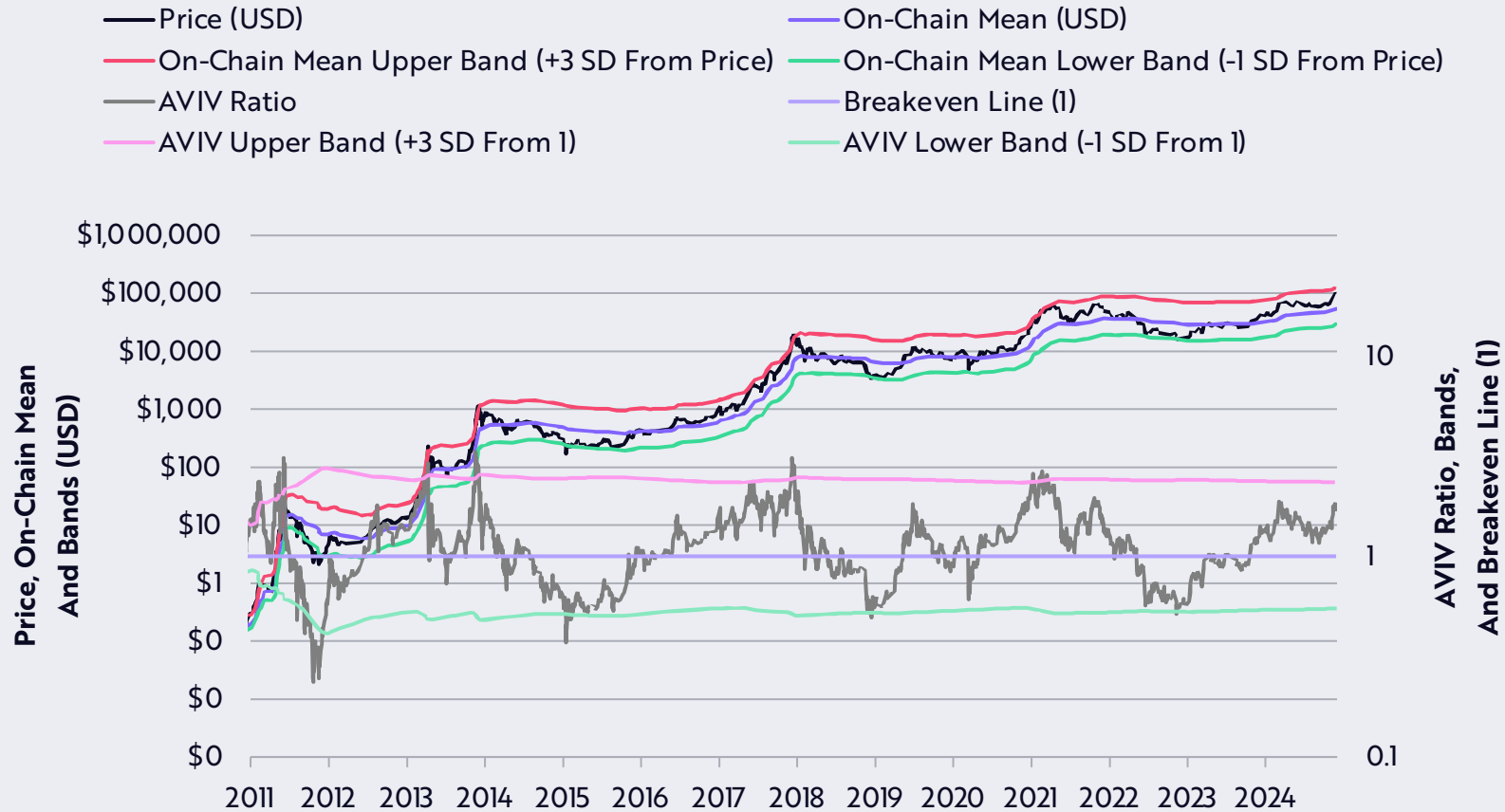
- During November, bitcoin's price increased 37.4% to \$96,514—its best monthly increase since February 2024.
- After breaking its all-time high the day after the US Presidential election, the bitcoin price increased as high as \$99,860 during November.
- During November, the bitcoin price closed above its 200-day moving average, its short-term-holder (STH) cost basis, and its on-chain mean at \$66,901, \$77,034, and \$54,814, respectively.

Source: ARK Investment Management LLC, 2024. Chart data from Glassnode. Information as of November 30, 2024. STH realized price data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. For more information on certain terms, please read our 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.



At November's Close, Bitcoin's AVIV Targeted \$129,000 As A Potential Global Top

Bitcoin AVIV Bands And On-Chain Mean Bands



ARK'S VIEW: BULLISH

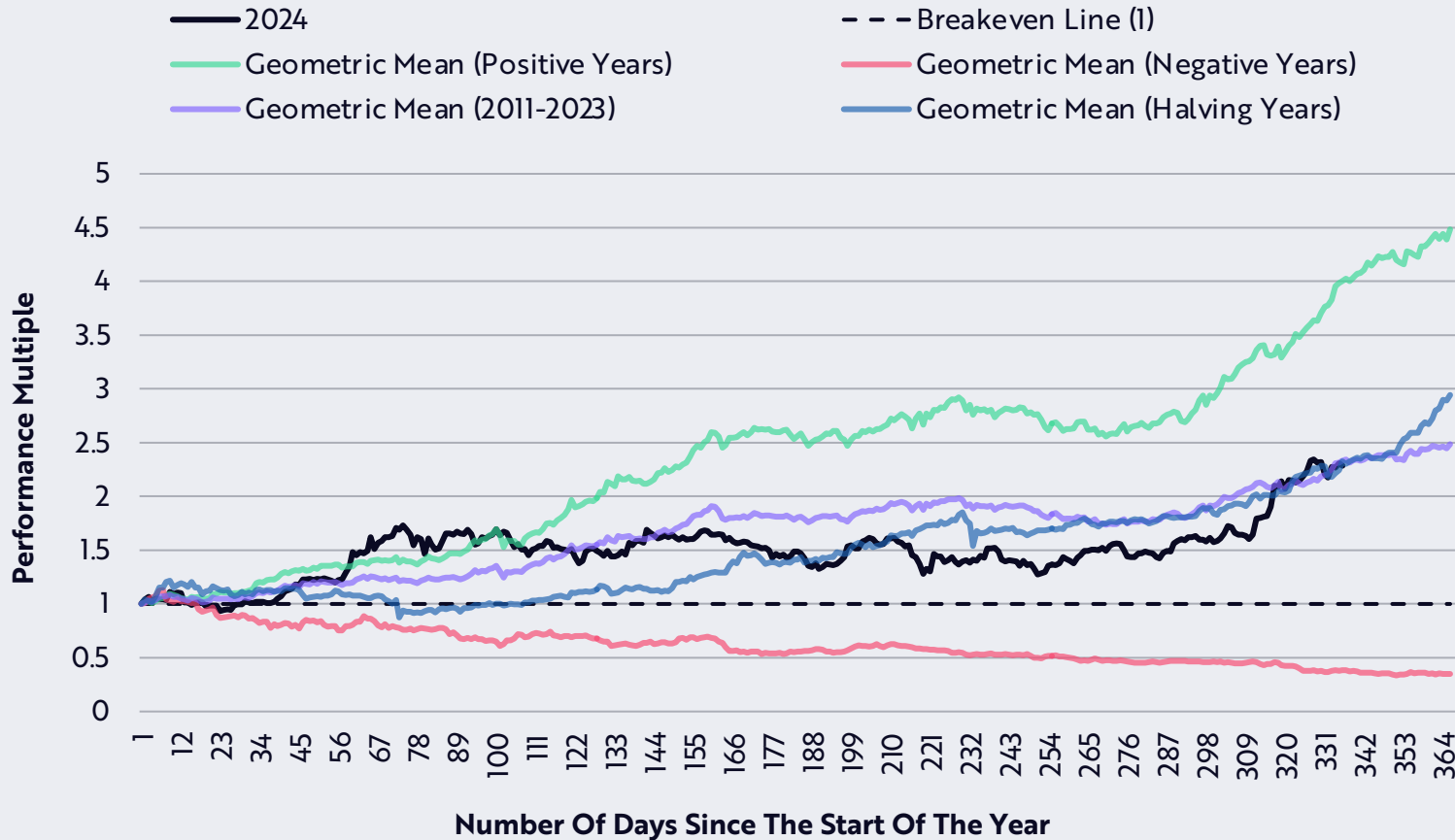
- Bitcoin's on-chain mean deviation bands have yet to signal irrational exuberance—as indicated by the pink line in the lower end of the chart—or three standard deviations from 1—the light purple line in the bottom of the chart.
- Extrapolating those values, the three-sigma upper deviation band projects a rolling price target of \$129,000 per bitcoin.
- If the recent bullish momentum were to continue, the price target should increase as well.

Source: ARK Investment Management LLC, 2024. Chart data from Glassnode. Information as of November 30, 2024. For more information on certain terms, please read our 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.



This Year, The Bitcoin Price Is On Track To Match Its Average Performance Per Year

Bitcoin Yearly Cycles: Geometric Means



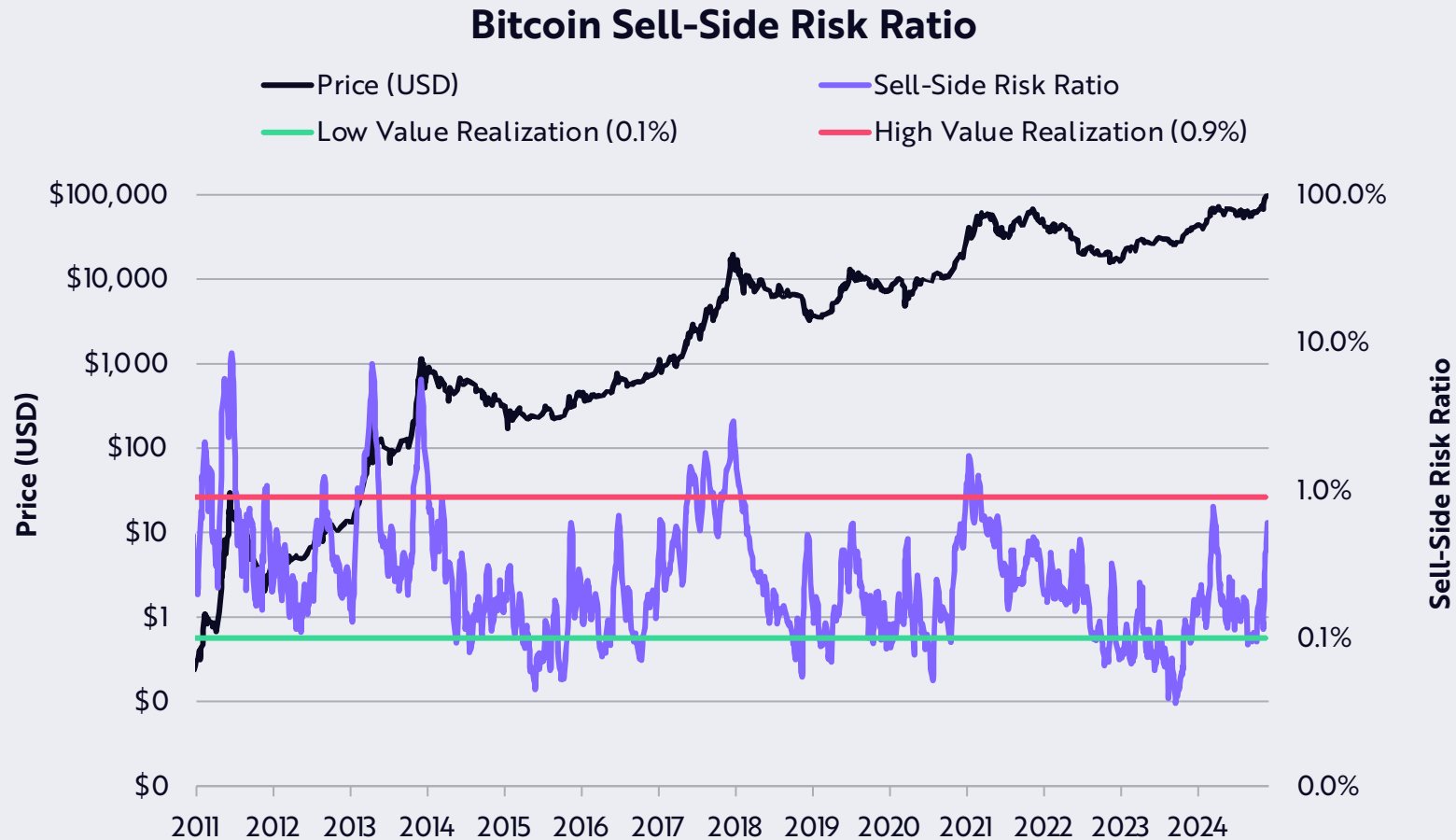
ARK'S VIEW: BULLISH

- As of the end of November, relative to the beginning of 2024, the price of bitcoin has increased 2.28x, slightly below the average multiple per year from 2011 to 2023 (2.33x), and slightly below its multiple of the average year in which halvings occurred (2.32x).
- Although 2024 still could deviate from the typical increase, if its performance were to match the average multiple increase, the price of bitcoin could hit \$104,000-124,000 by year-end.
- On December 5, bitcoin reached \$104,000 temporarily.

Source: ARK Investment Management LLC, 2024. Chart data from Glassnode. Information as of November 30, 2024. For more information on certain terms, please read our 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.



Bitcoin's Sell-Side Risk Ratio Was Neutral To Slightly Overbought At The End Of November



ARK'S VIEW: NEUTRAL

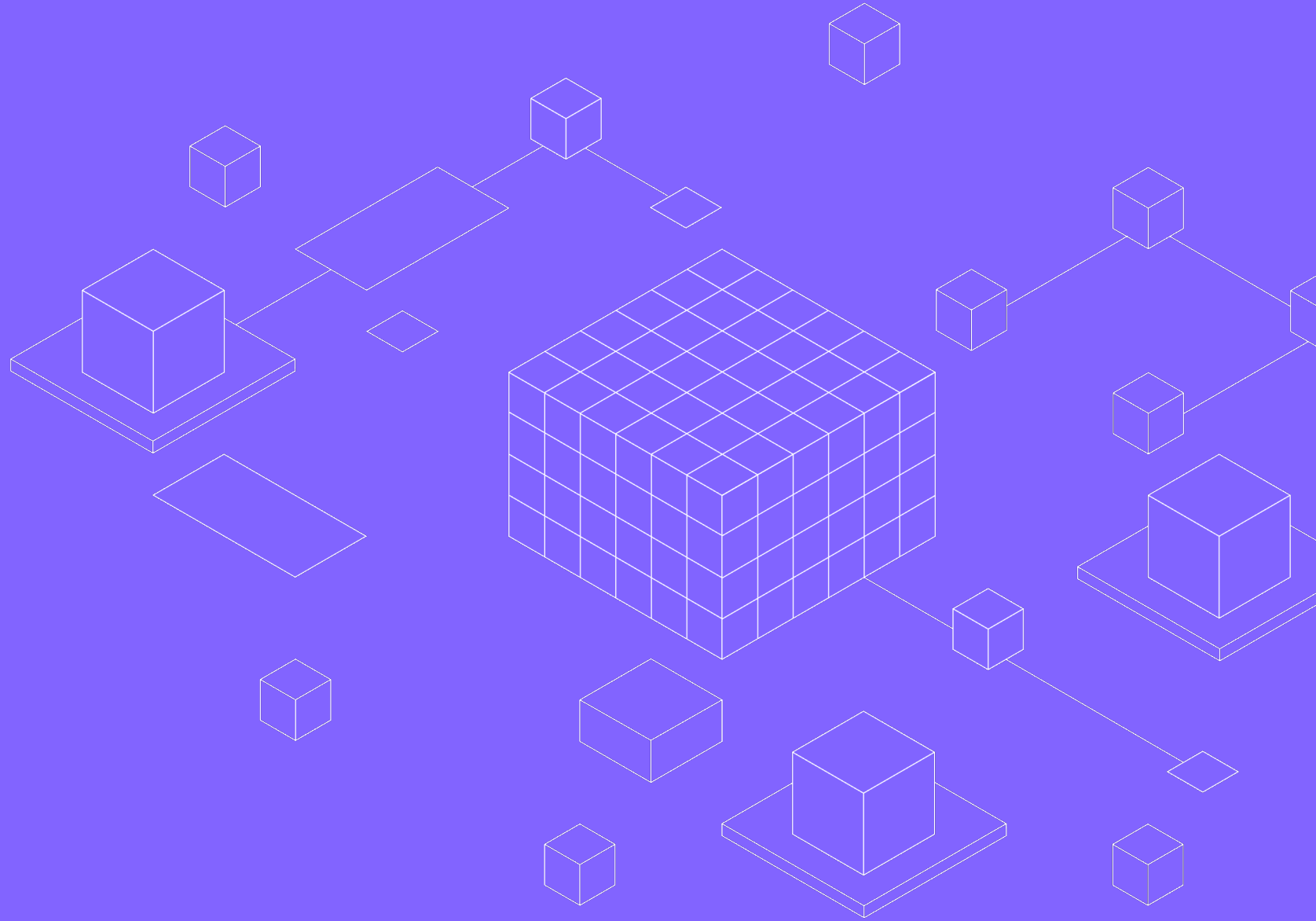
- While its sell-side risk ratio was high at the end of November, bitcoin was still below its historically "overbought"^[1] level at 1% or above.
- The sell-side risk ratio nets bitcoin's realized profits relative to its losses on-chain and divides them by its cost basis (realized cap).

[1] In the chart above, "overbought" is defined by the red, upper line, denoting that bitcoin's realized profits are high relative to cost basis. Conversely, "oversold" is conveyed by the green, lower line, denoting high losses relative to cost basis. Source: ARK Investment Management LLC, 2024. Chart data from Glassnode. Information as of November 30, 2024. For more information on certain terms, please read our 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.



Section 03

Optimism Overshadows Economic Imbalances





The Bitcoin-To-Gold Ratio Highlights Risk-On Sentiment

Bitcoin-To-Gold Price Ratio
(Weekly)



ARK'S VIEW: BULLISH

- On a weekly basis, the bitcoin-to-gold price ratio hit a new high at 36.7x.
- A rising bitcoin-to-gold price ratio could signal a shift in investor sentiment toward growth assets subject to higher volatility relative to traditional safe-haven assets like gold.
- Moreover, a rising bitcoin-to-gold price ratio could signal growing acceptance of bitcoin as a store-of-value.

ARK Investment Management LLC, 2024. Chart data from Macrobond. Information as of November 29, 2024. 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.



Smaller Firms Are Struggling Relative To Larger Firms

US Net Income
(Noncorporate Divided By Corporate)



ARK'S VIEW: BEARISH

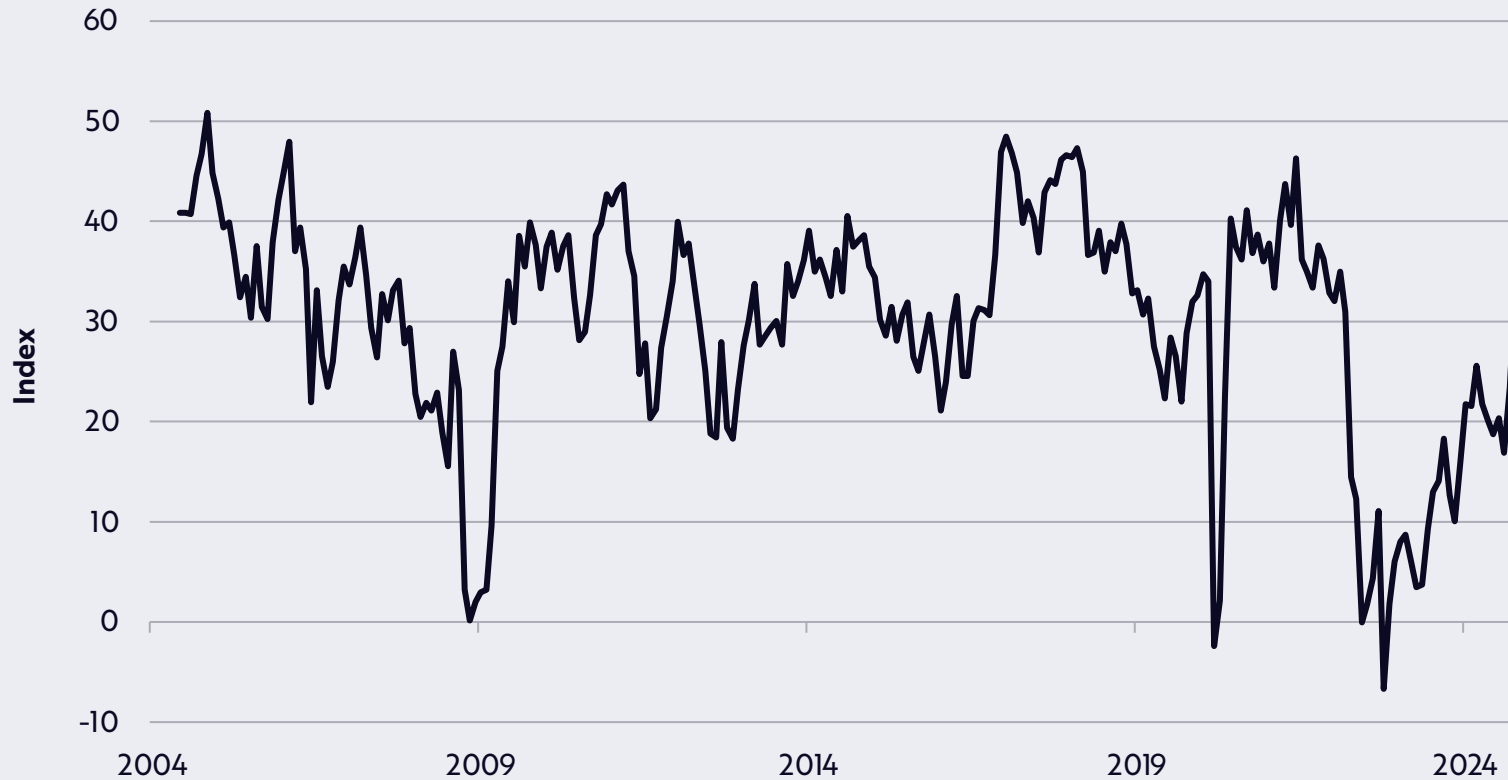
- Noncorporate firms tend to be small businesses, while corporate firms are larger businesses.
- Today, the net income of noncorporate firms is ~80% that of corporate firms, lower than at any time since the government starting tracking this data in 1959.
- Post-Covid, higher interest rates impacted smaller firms disproportionately.
- Small businesses are the largest private sector job creators.

ARK Investment Management LLC, 2024. Chart data from Macrobond. Information as of November 30, 2024. 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.



Manufacturers Are Optimistic About Future Economic Activity

Average Future New Orders
(Regional Fed Manufacturing Surveys)



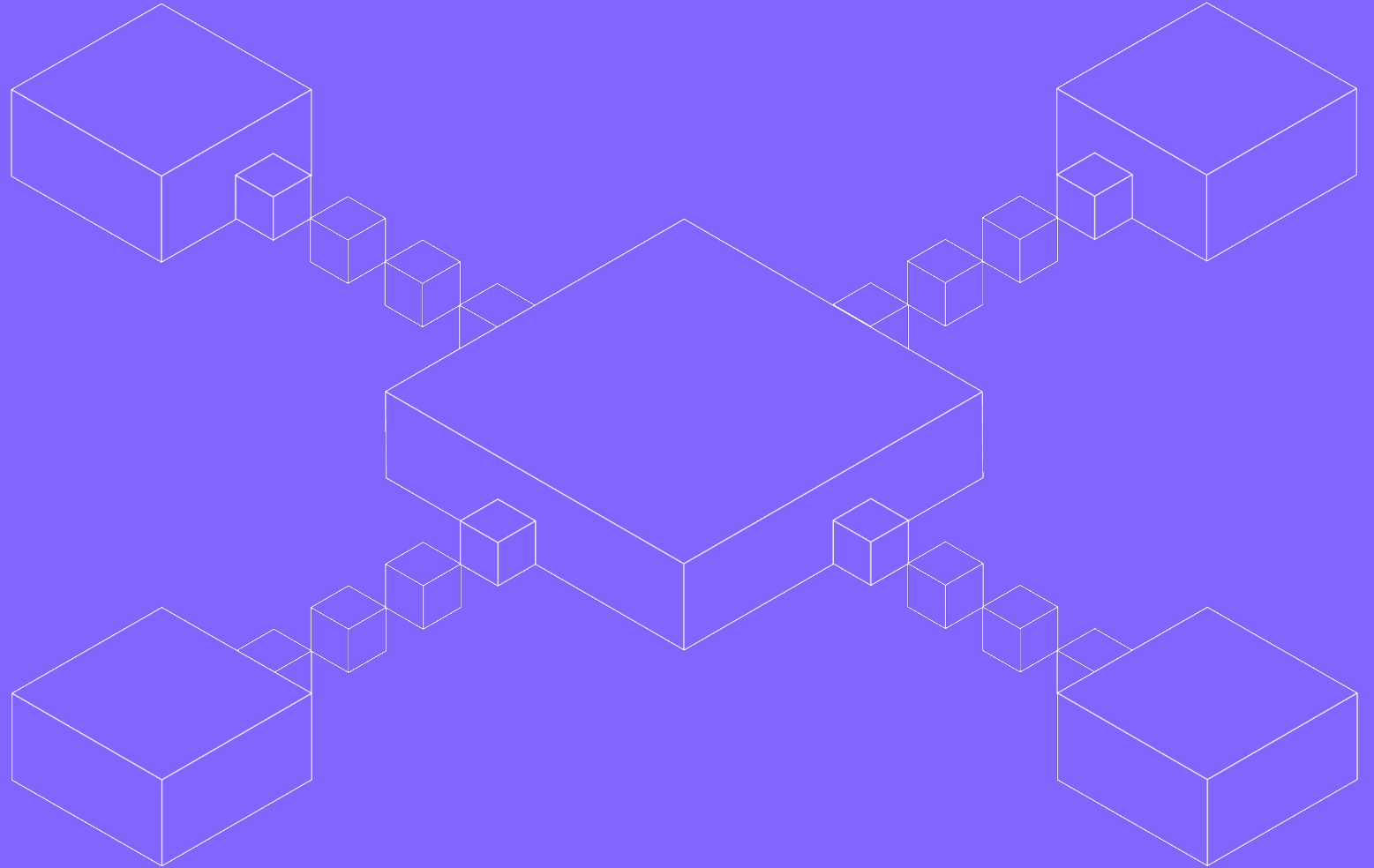
ARK'S VIEW: BULLISH

- Future new orders, which measure sentiment about future business activity, indicate a surge in optimism among manufacturers since October.



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.

AVIV Ratio: The ratio of active capitalization (market cap adjusted for dormant coins) and investor capitalization (cost basis of the bitcoin secondary market, after a miner has sold their new coins to a counterparty).

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.

Coinblocks Created: The number of coins in the Bitcoin network times the number of blocks at any given day.

Coinblocks Destroyed: The number of coins transacted at any given day times the number of blocks each coin remained dormant.

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.

Fiat Currency: Government-issued money that is not backed by a commodity like gold or silver, but rather by the government that issues it.

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 *nominal* 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. The *real* GDI adjusts for price change by expressing values at base-year prices, not current market prices.

Gross Domestic Product (GDP): This is the *nominal* 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. The *real* GDP adjusts for price change by expressing values at base-year prices, not current market prices.

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.

M2: A measure of the US money stock that includes M1 (currency and coins held by the non-bank public, checkable deposits, and travelers' checks) plus savings deposits (including money market deposit accounts), small time deposits under \$100,000, and shares in retail money market mutual funds.

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.



Glossary Of Terms, Continued

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

MVRV Z-Score: Defined as the ratio of the difference of market cap and realized cap to the cumulative, inception-to-date standard deviation of market 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.”

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.

SOPR: The Spent Output Profit Ratio is calculated by dividing the realized value of a spent output (in USD) divided by the dollar value at the point of its creation. In other words, it divides the aggregate price of coins sold by the aggregate price where those coins were initially bought.

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

S&P 500 Index: Short for “The Standard and Poor’s 500,” it is a stock market index tracking the performance of 500 of the largest public companies in the United States.

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).



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