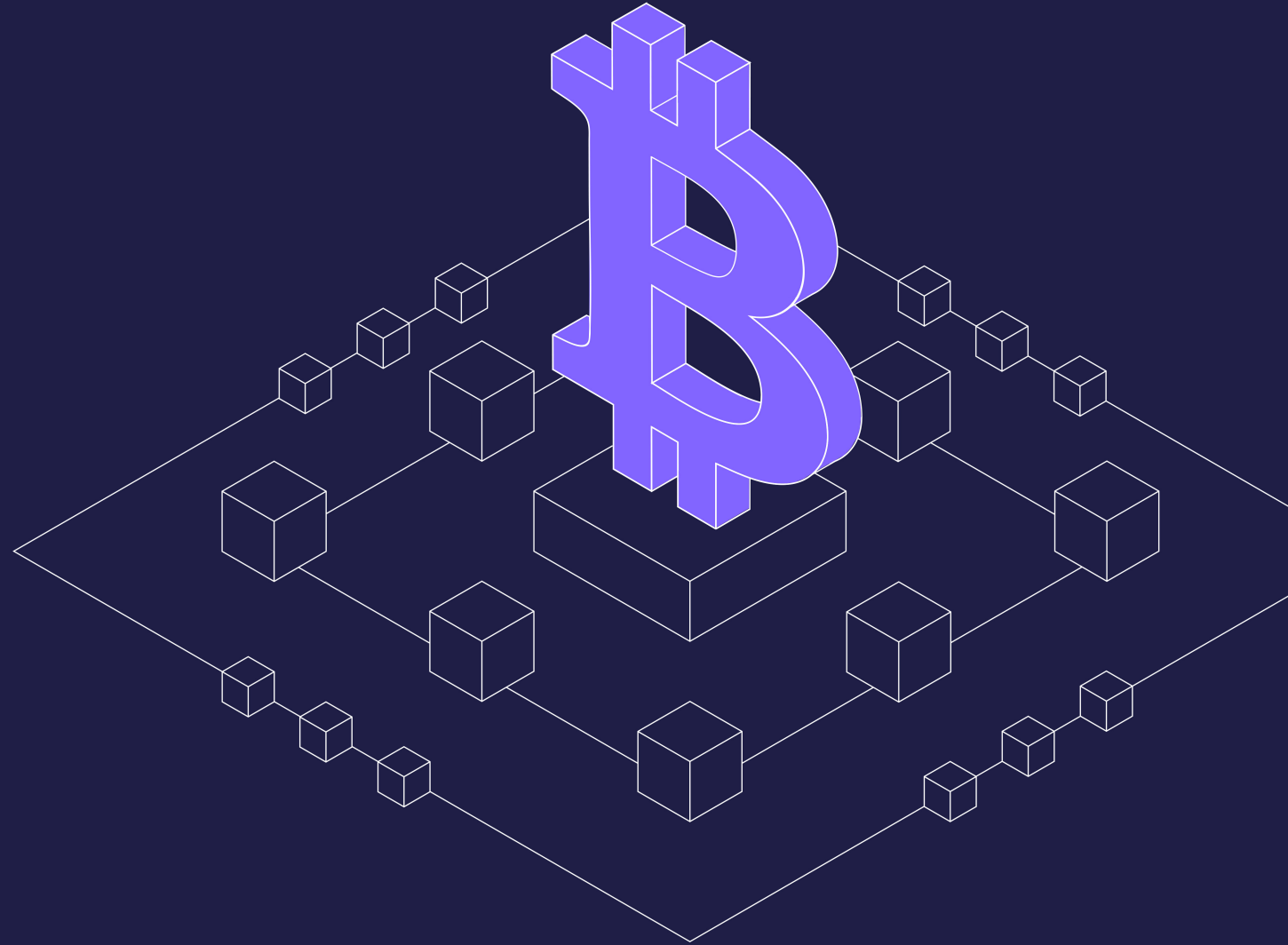




As of April 30, 2024

THE BITCOIN MONTHLY

IN THE WAKE OF THE
FOURTH HALVING



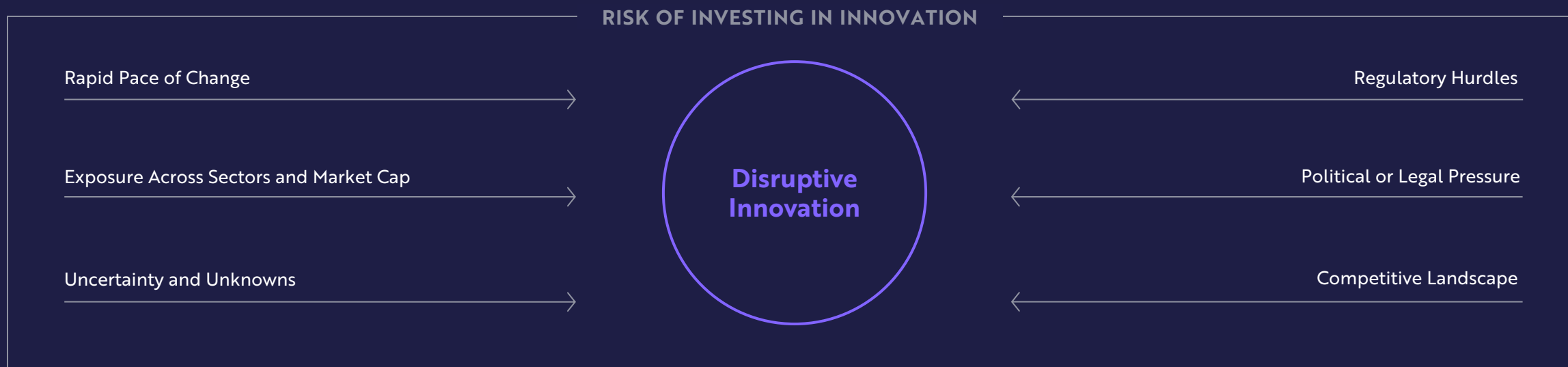
For Informational Purposes Only. ARK Investment Management LLC, 2024 This is not investment advice or a recommendation in relation to any named particular securities or cryptocurrencies and no warranty or guarantee is provided. Any references to particular securities or cryptocurrencies are for illustrative 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.**



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.



→ **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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Bitcoin Ended April In Correction Territory

03

Higher-For-Longer Interest Rates Are A Problem

04

Appendix: Glossary Of Terms



Section 01

Market Summary





Bitcoin Found Its Short-Term-Holder Cost Basis By April's End

Bitcoin Ended April In Correction Territory

- During April, bitcoin's price decreased 14.97% to \$60,622, correcting 20.04% from its all-time high.
- The issuance of bitcoin "halved"^[1] on April 19.
- Halving events occur roughly every four years.
- Previous halving events have set the stage for upward momentum within the subsequent year.
- On a 30-day rolling basis, the sum of bitcoin US ETF flows turned negative during the last week of April, booking month-to-month net outflows of up to \$1.3 billion as of May 1.

Higher-For-Longer Interest Rates Are A Problem

- The Japanese yen continued to depreciate while high interest rates torpedoed a fourth regional bank in the US, highlighting financial instability.
- Pessimism among small businesses and a more flexible labor market signal increasing economic difficulties and changing job trends.

ARK'S KEY TAKEAWAYS

- In April, bitcoin's price decreased 14.97% to \$60,622. The correction followed its failure to break its 2021 highs conclusively.
- The yen's depreciation underscores current financial turbulence that also includes regional bank failures in the US, small business concerns, and labor market adjustments.

[1] The Halving Day celebrates when bitcoin's issuance gets cut in half programmatically every 210,000 blocks (approximately every four years). In addition to the rate of issuance of bitcoin being cut in half, the rewards for successful bitcoin miners are also cut in half. Source: ARK Investment Management LLC, 2024. Data from [Classnode](#) unless otherwise specified. Data valid as of May 3, 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

[Genesis Completes Redemption Of GBTC Shares, Buys 32K Bitcoins With Proceeds](#)

[New York Jury Finds Do Kwon, Terraform Labs Liable For Fraud In SEC Case](#)

[Spot Bitcoin ETF Cumulative Trading Volume Crosses \\$200 Billion](#)

[Uniswap Receives SEC Lawsuit Warning, CLO Describes It As "Another Abuse Of Power"](#)

[Hong Kong Approves First Batch Of Spot Bitcoin, Ether ETFs In Drive To Become Crypto Hub](#)

[Binance's \\$1-Billion Emergency "SAFU" Fund Now Makes Up 3% Of UDSC Supply](#)

[Bitcoin Ushers In Fourth Halving As Miners' Block Subsidy Reward Drops To 3.125 BTC](#)

[Mt. Gox Creditors Report Bitcoin And Bitcoin Cash Payment Update On Claims System](#)

[Hong Kong Bitcoin And Ether ETFs Have Soft Debut](#)

[Coinbase Rolls Out Lightning Network Support In Collaboration With Lightspark](#)

[Early Bitcoin Investor Roger Ver Arrested, Charged With Alleged Tax Fraud](#)

[Four Months In Prison For CZ, Another US State Kicks Out Binance.US](#)



Excluding A Drop In Miner Revenue Associated With The Halving, On-Chain Metrics Remained Net Positive

	Bitcoin Metrics ¹	Unit	April 2024	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	378.4	+5.9%	+80.8%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	34.07	-46.6%	+26.1%	Neutral	↓
Network Usage	<u>Active Owners</u> ² (Active Entities, 7-Day Moving Average)	Thousands	255.1	1.5%	-5.6%	Neutral	↑
	<u>Transaction Volume</u> ² (7-Day Moving Average)	BTC (Thousands)	96.3	-24.7%	+3.02%	Neutral	No Change
Holder Behavior	<u>Long-Term-Holder Supply</u> ² (Coins Held for 155 Days+)	BTC (Millions)	13.9	-0.07%	-1.4%	Bearish	↓
	<u>Locked Supply</u> ² (Illiquid Supply)	BTC (Millions)	15.2	+0.6%	+3.4%	Bullish	No Change
	<u>Time-Weighted Turnover</u> ² (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	8.6	-36.2%	+24.8%	Bullish	↑

[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 April 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.

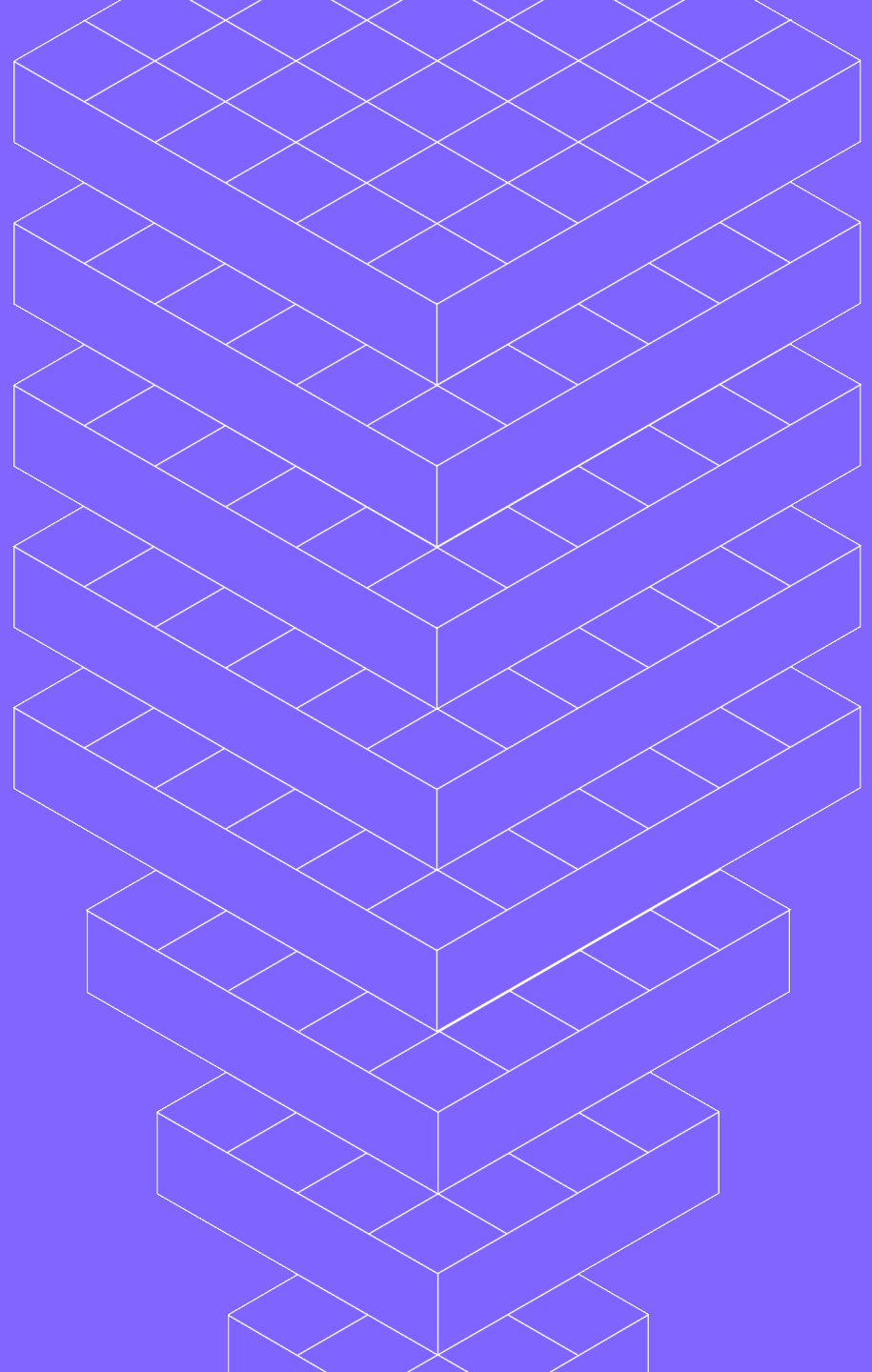


The Derivatives Market Turned Positive As Realized Market Returns Hit Breakeven

	Bitcoin Metrics ¹	Unit	April 2024	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$28,837	+3.3%	+44.5%	Bullish	No Change
	<u>Percent Supply In Profit</u>	pp	82.3	-15.6	+11.5	Neutral	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$59,638	+3.6%	+145.1%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	6.29%	-7.7	+0.7	Bullish	↑
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated)	pp	-0.04%	-0.15	0	Bullish	↑ ↑
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	7.06%	-19.3	+4.2	Bullish	↑ ↑

[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 April 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.

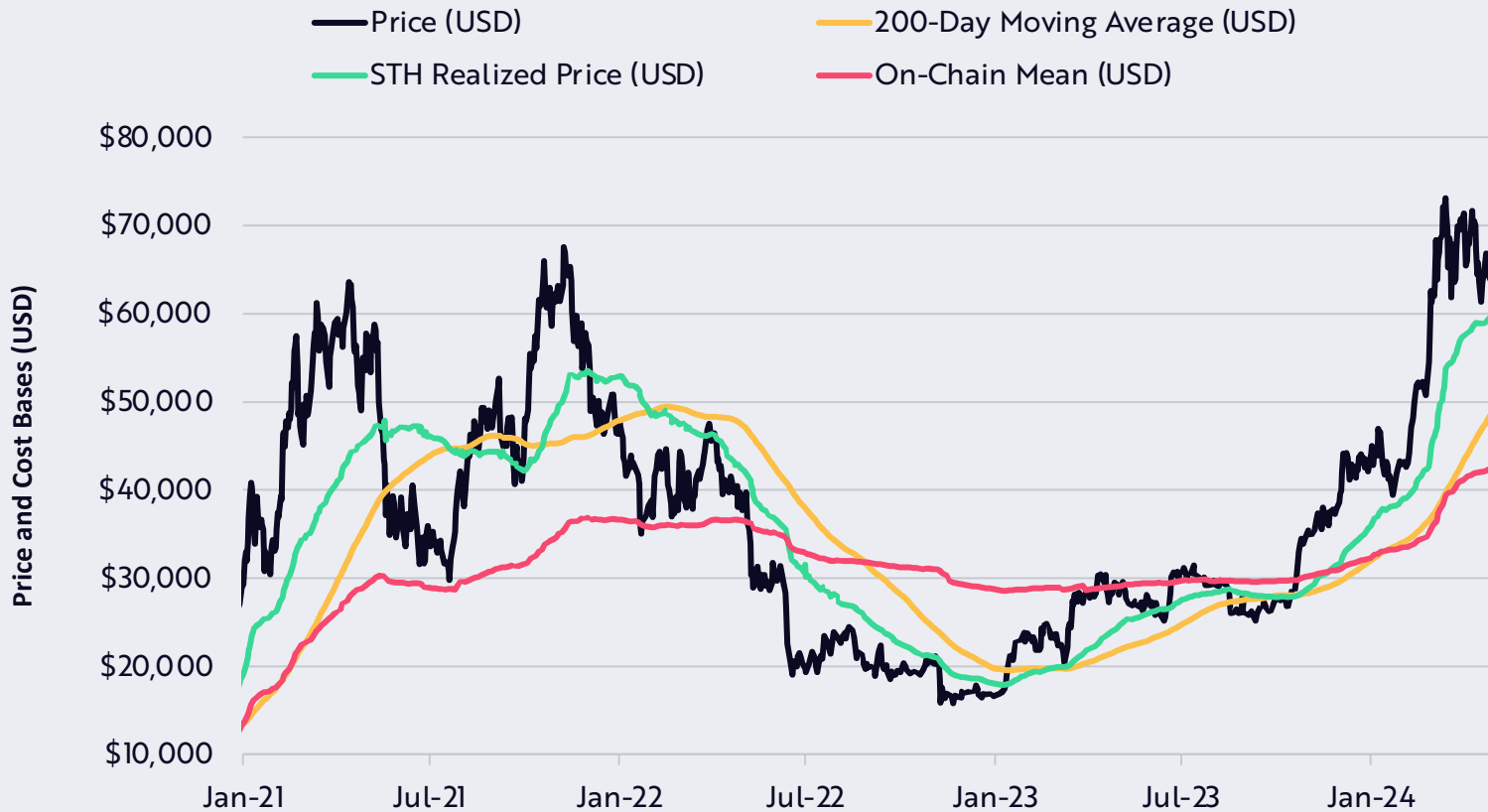
Bitcoin Ended April In Correction Territory





Bitcoin Revisited Its Short-Term-Holder Cost Basis

Bitcoin Mean Reversion



ARK'S VIEW: BULLISH

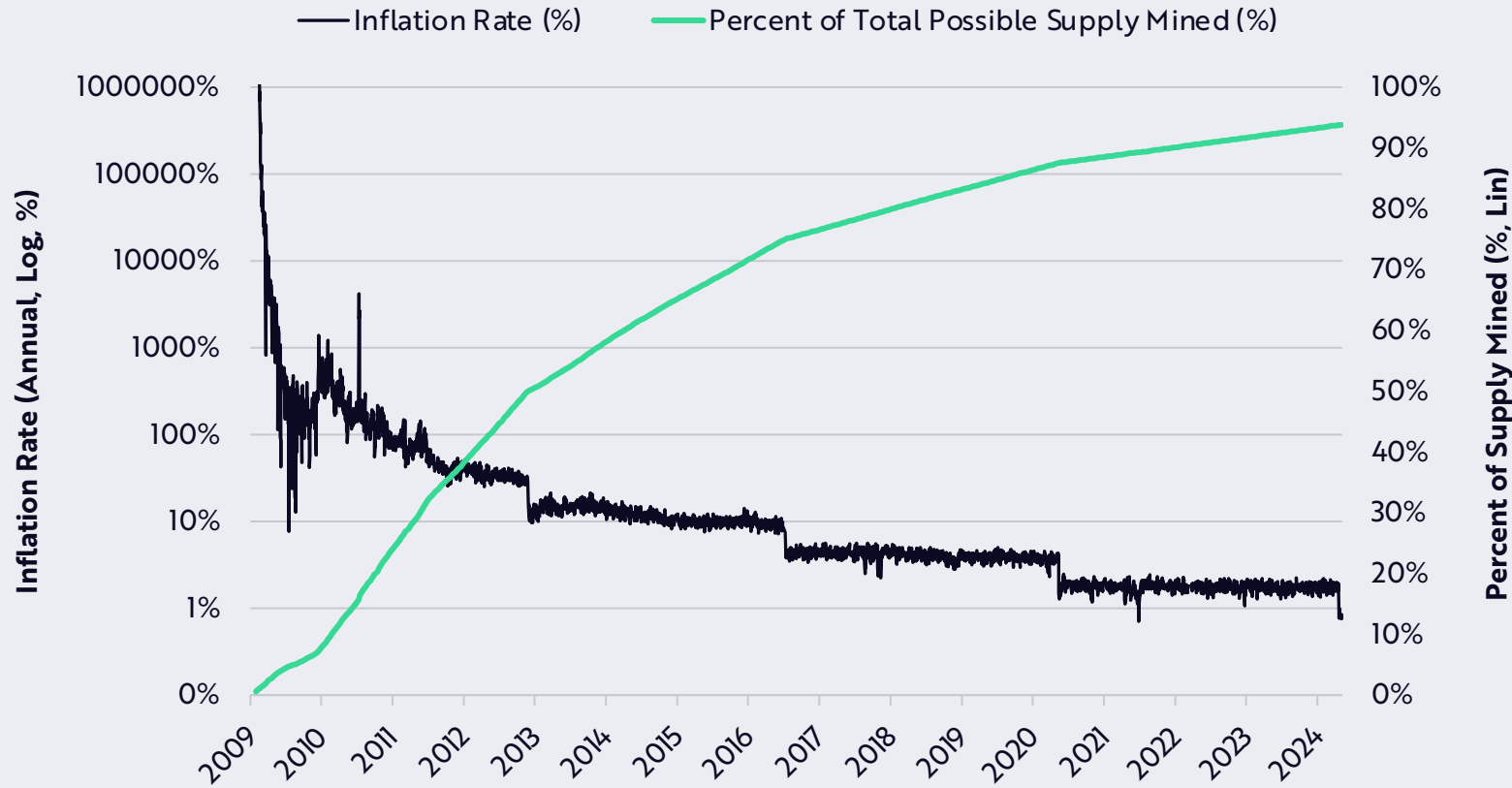
- In April, bitcoin's price decreased 14.97% to \$60,622. The correction followed its failure to break its 2021 highs conclusively.
- By the end of April, bitcoin had corrected 20.04% from its all-time high.
- The next day, on May 1, bitcoin corrected to its short-term holder (STH) cost basis at \$59,313.
- Two additional crucial support levels remained (as of May 1):
 - 200-day moving average: \$49,335, or 15.37% below price.
 - On-chain mean: \$42,538, or 27.03% below price.

Source: ARK Investment Management LLC, 2024. Chart data from [Glassnode](#). Information as of May 3, 2024. 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.



Upon Its Fourth Halving, 93.7% Of Bitcoin Supply Has Been Mined

Bitcoin Inflation Rate and Percent of Supply Mined



ARK'S VIEW: BULLISH

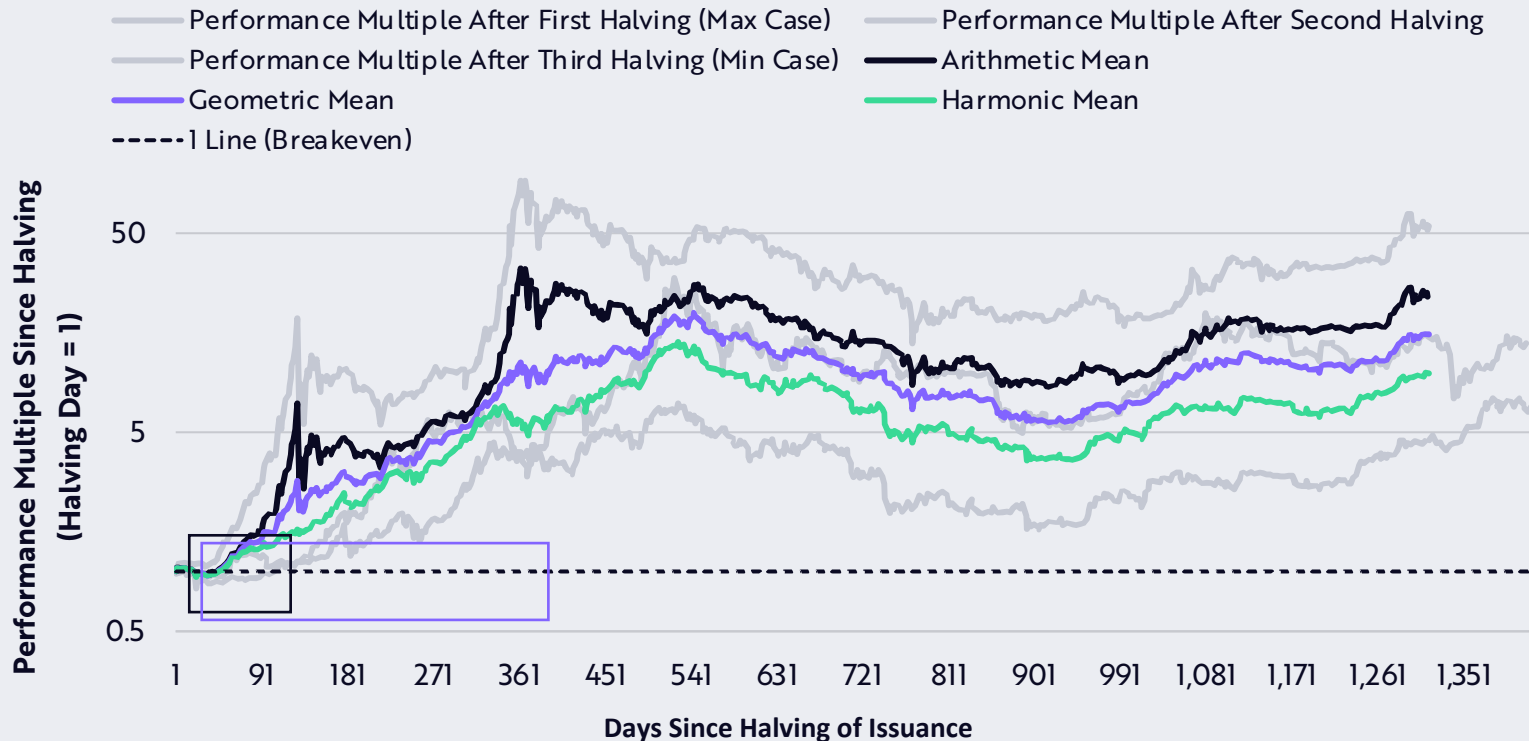
- On April 19, the bitcoin community celebrated its Halving Day.
- At the beginning of April, the network produced 900 bitcoin on average per day at an annualized inflation rate of ~1.8%. Now, the network produces only ~450 bitcoin on average per day at an inflation rate of ~0.9%.
- As of month's close, 93.7% of all bitcoin has been mined.

Source: ARK Investment Management LLC, 2024. Chart data from [Glassnode](#). Information as of May 3, 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.



Previous Halving Events Set The Stage For Long-Term Momentum

Bitcoin Performance Multiple Since Halving Day^[1] (Halving Day = 1)



[1] Arithmetic mean is commonly referred to as an “average,” as it is calculated by dividing the sum of a collection of numbers by the amount of numbers in the collection. Geometric mean is an average calculated by taking the product of a collection of numbers and finding the root of the product. Harmonic mean is the reciprocal of the average of the reciprocals of the numbers included in a collection. The harmonic mean is always the least of the three means, while the arithmetic mean is always the greatest of the three and the geometric mean is always in between. . Source: ARK Investment Management LLC, 2024. Chart data from [Classnode](#). Information as of May 3, 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.

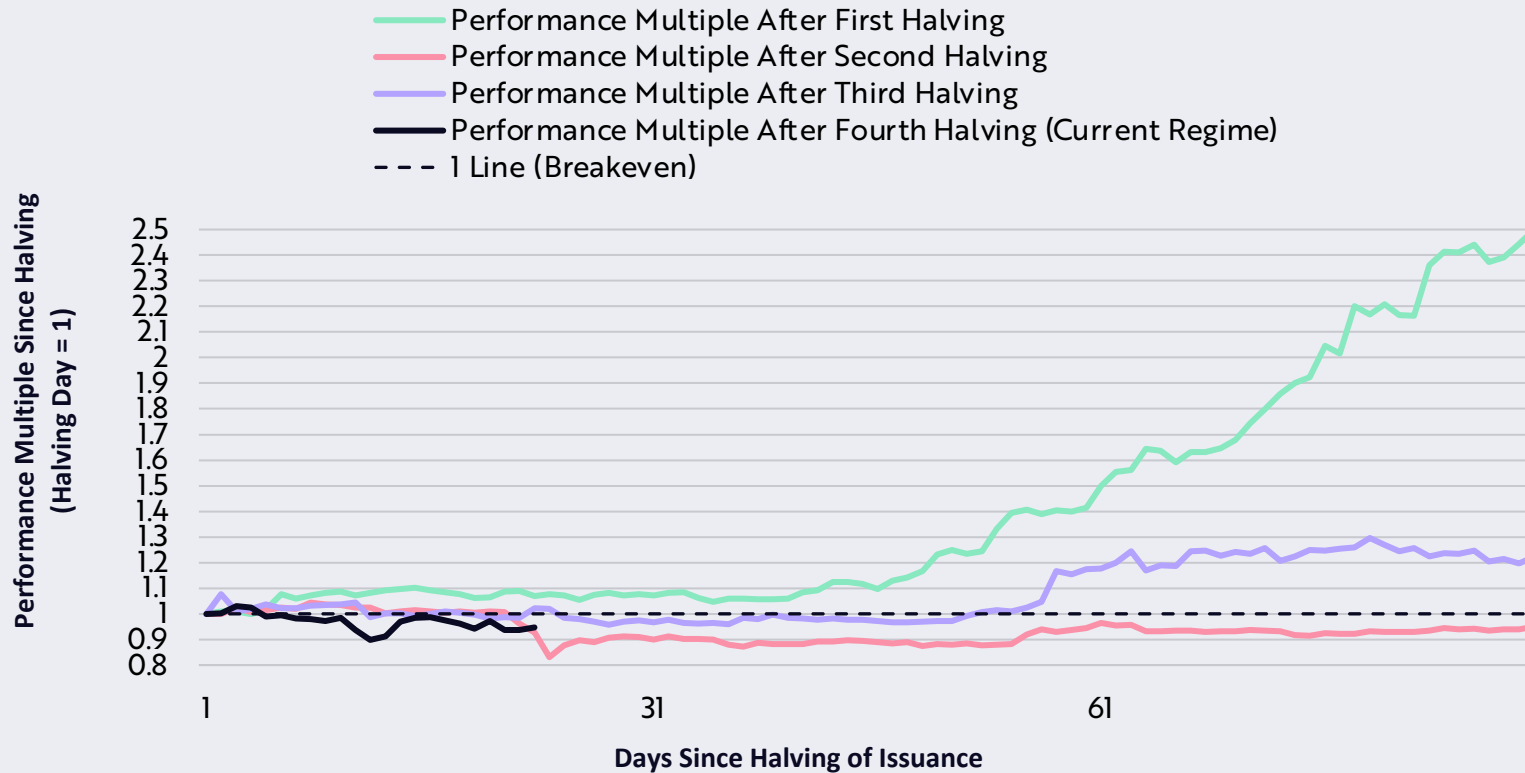
ARK'S VIEW: BULLISH

- Since its inception, bitcoin has halved four times, each halving a precursor to upward momentum on a long-term time horizon.
- During the first quarter after halving, bitcoin's performance historically has been negative-to-muted (see the black square in the chart). After one year (purple rectangle), bitcoin has achieved a performance multiple between 3x and 70x+.
- Assuming a 3x bitcoin price increase a year after the halving this time around might be too optimistic. That said, this chart highlights the case for bitcoin's increasing scarcity over a meaningful time horizon.



The Quarter Following Each Of Bitcoin's Three Previous Halvings Saw 0.8x - 2.5x Performance Multiples

Bitcoin Performance Multiple Since Halving Day
(Halving Day = 1)



ARK'S VIEW: BULLISH

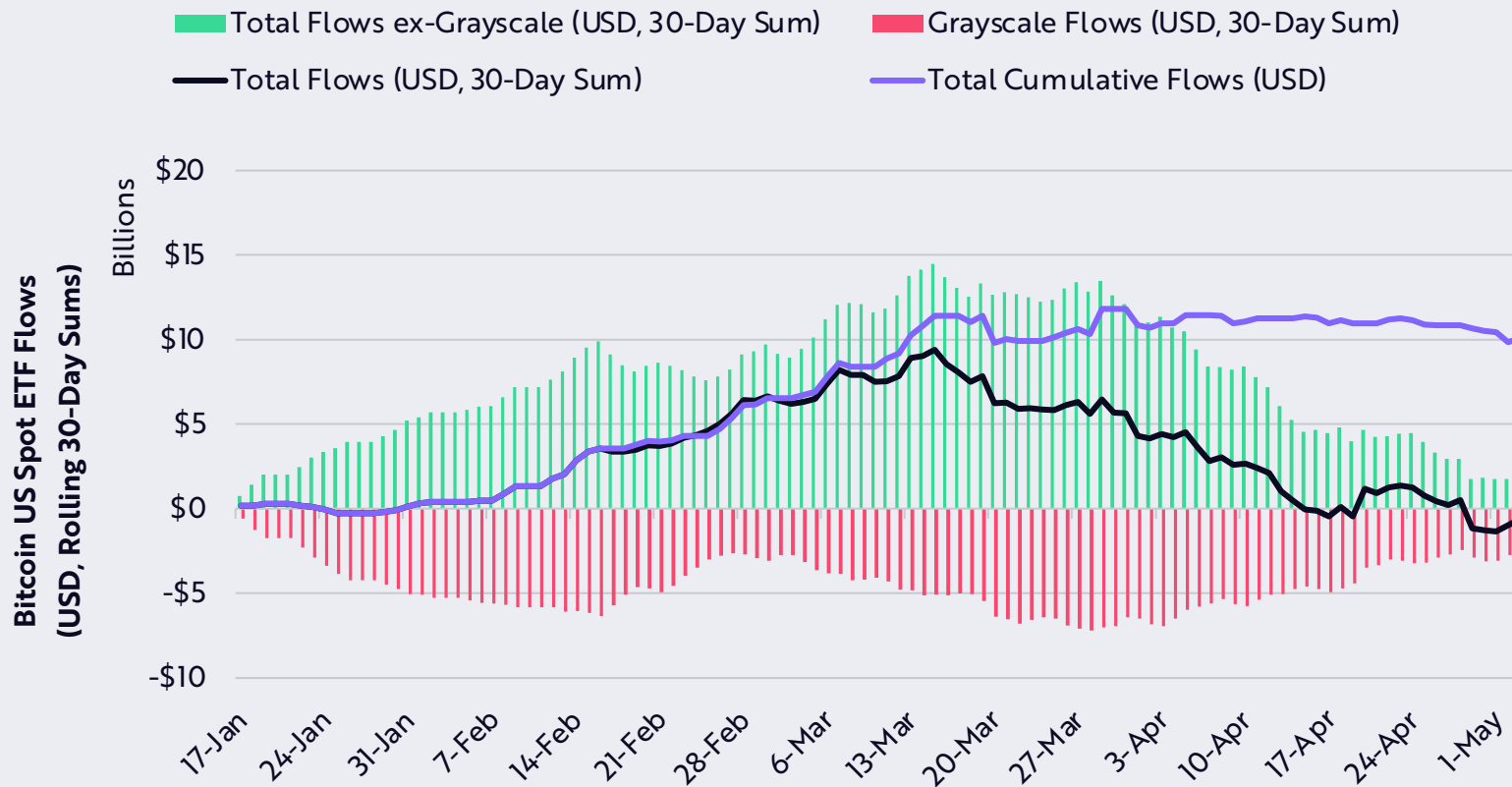
- After each of the last three halving cycles, bitcoin's performance multiple has varied between 0.8x and 2.5x. This suggests that short-term volatility may arise after Halving Days.

Source: ARK Investment Management LLC, 2024. Chart data from [Glassnode](#). Information as of May 3, 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.



Spot Bitcoin ETFs Outflowed In April

Bitcoin US Spot ETF Flows^[1]
(Rolling 30-Day Sum and Cumulative Sum)



ARK'S VIEW: NEUTRAL

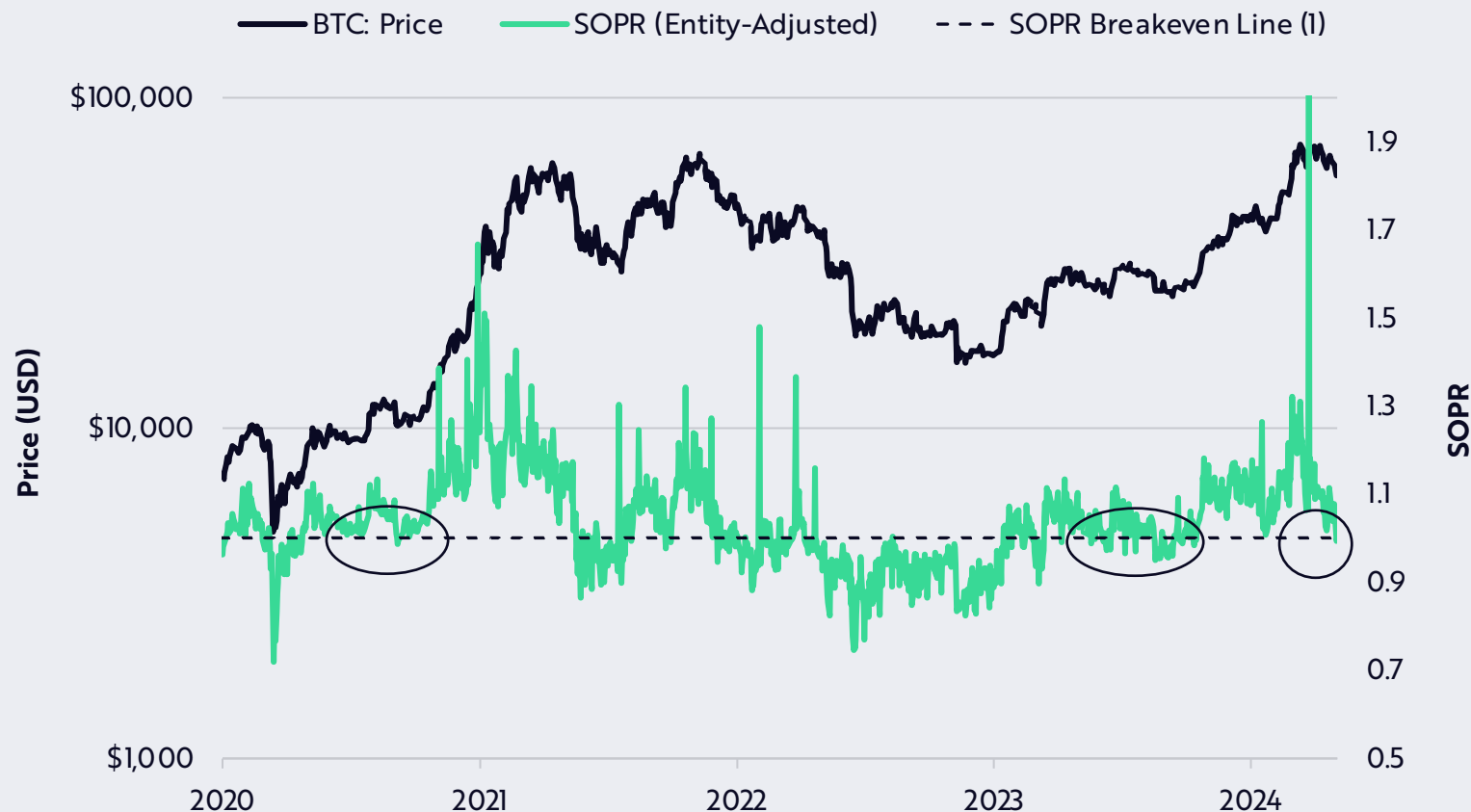
- On a 30-day rolling basis, spot bitcoin US ETF flows turned negative in the last week of April. Net outflows totaled ~\$1.3 billion on May 1.
- On a 30-day basis, spot bitcoin US ETFs saw their largest net inflows, \$9 billion, during March.
- On a cumulative basis, bitcoin US ETF flows have flattened. Net flows since inception have totaled \$10.4 billion.

[1] Note from data provider on flows: "In order to calculate current ETF balances and inflows/outflows, we use the closing BTC/USD exchange rate at 16:00 NYC time. It's important to note that different ETF issuers may use slightly different BTC/USD rates, resulting in approximate values that may deviate from actual values." Source: ARK Investment Management LLC, 2024. Chart data from [Classnode](#) (10 ETF issuers, excluding DEFI). Information as of May 3, 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.



Bitcoin's Spent Output Ratio Hit Breakeven At The End Of April

Bitcoin SOPR (Spent Output Ratio)



ARK'S VIEW: BULLISH

- Bitcoin's spent output ratio (SOPR) returned to 1 on May 1, suggesting that the market's bitcoin investments are breakeven—a 1:1 ratio of price bought to price sold.
- According to ARK's research, that dynamic usually correlates with local bottoms in bull market regimes.
- The SOPR ratio is calculated 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.

Source: ARK Investment Management LLC, 2024. Chart data from [Glassnode](#). Information as of May 3, 2024. 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.



Section 03

Higher-For-Longer Interest Rates Are A Problem





The Yen Weakened Rapidly In April



ARK'S VIEW: BEARISH

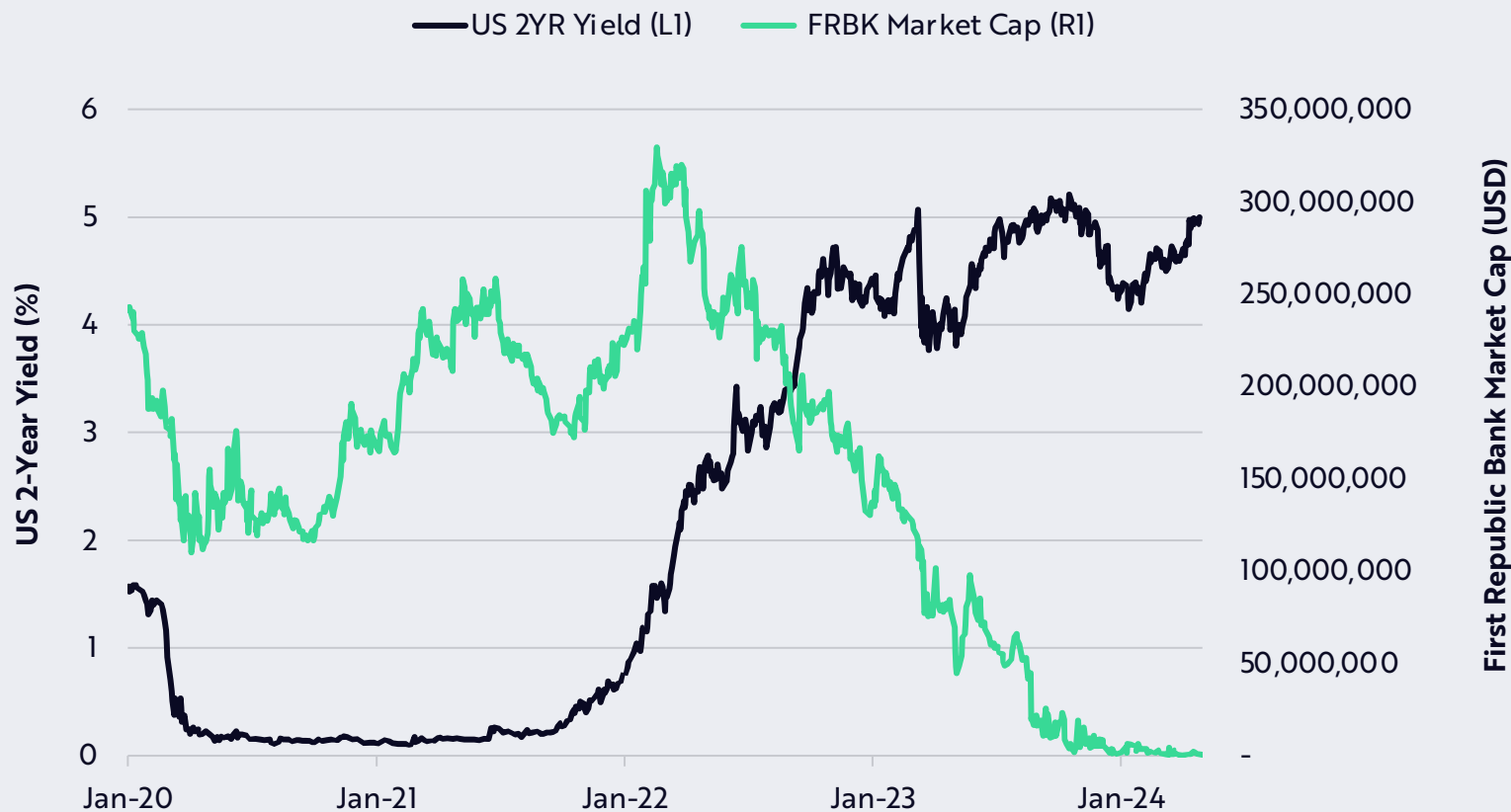
- Since January 2023, the Japanese Yen has depreciated ~19% against the US Dollar (USD) and recently passed ¥160/USD, a foreign exchange rate not seen since the early 1990s.
- The depreciation occurs as US interest rates remain high relative to Japanese interest rates.
- While a weakening currency may help boost a country's exports, it also can punish households that rely on the yen to purchase everyday goods imported from other countries.

Source: ARK Investment Management LLC, 2024. Chart data from Macrobond. Information as of April 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.



High Interest Rates Have Crippled Another Regional Bank In The US

US 2-Year Yield vs. First Republic Bank Market Cap



ARK'S VIEW: BEARISH

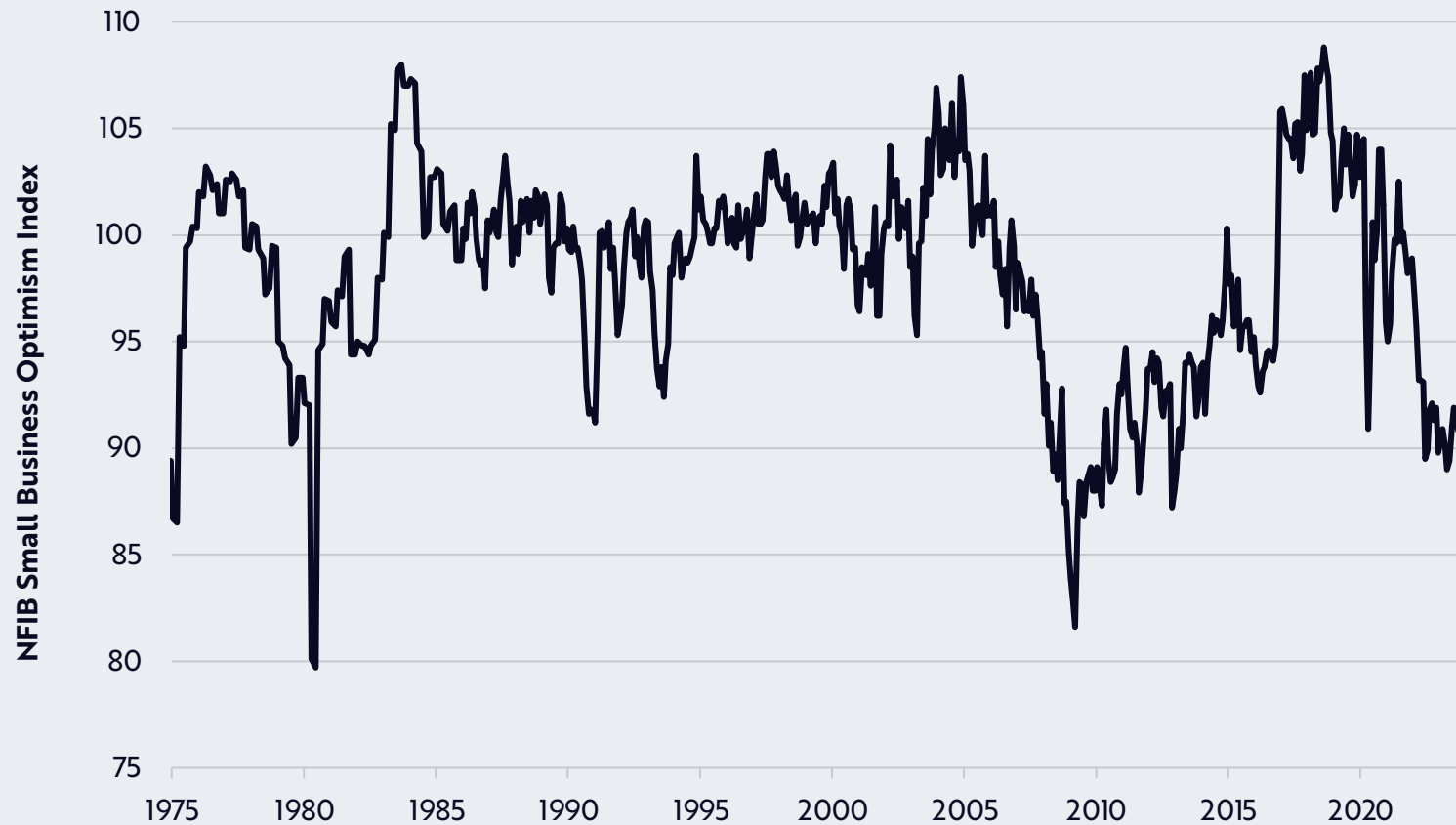
- Another regional bank has succumbed to “higher for longer” interest rates.
- First Republic Bank's market cap collapsed from \$300 million market cap in early 2022.
- In April, Fulton Bank acquired First Republic after paper losses associated with higher bond yields impaired its equity and uninsured deposits fled.

Source: ARK Investment Management LLC, 2024. Chart data from Bloomberg. Information as of April 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.



Small Businesses Optimism Has Collapsed

NFIB Small Business Optimism Index



ARK'S VIEW: BEARISH

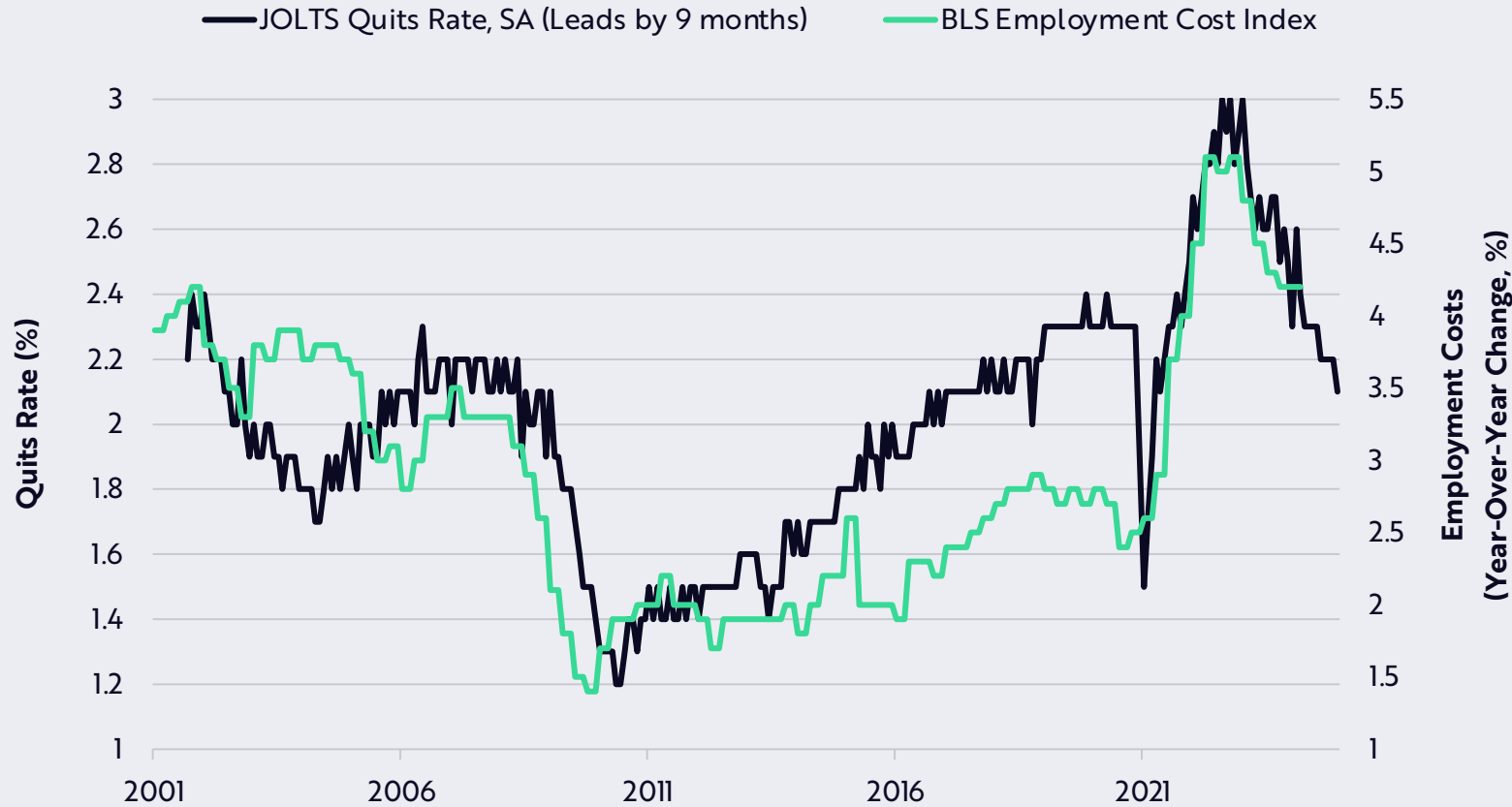
- US small business optimism has reached its lowest level since December 2012.
- Small businesses are the primary drivers of job creation.
- Plummeting confidence suggests that the labor market is weaker than headline figures indicate.

Source: ARK Investment Management LLC, 2024. Chart data from Macrobond. Information as of April 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.



The Labor Market Is Loosening

JOLTS Quits Rate vs. BLS Employment Costs



ARK'S VIEW: NEUTRAL

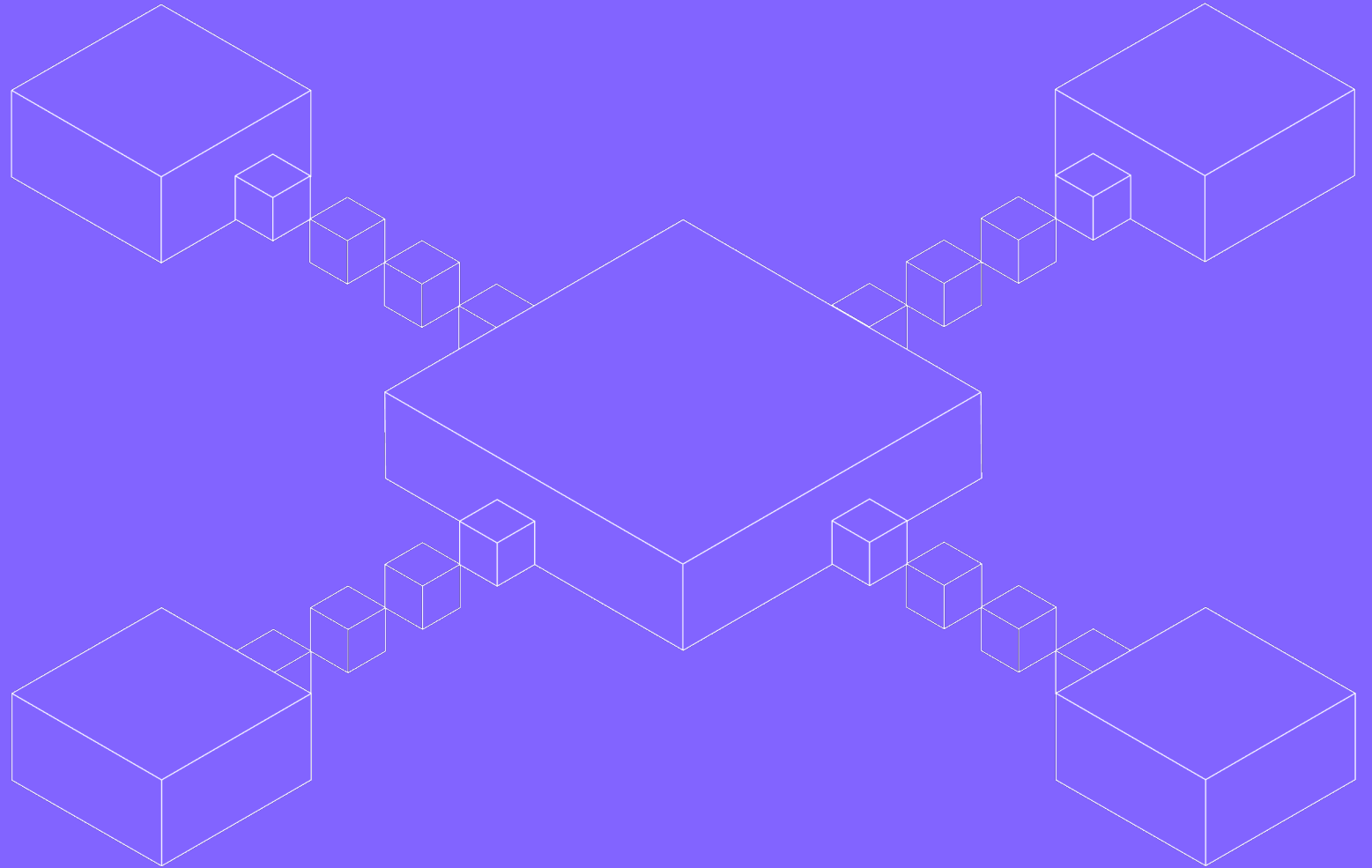
- The quits rate captures voluntary separations initiated by employees rather than by employers.
- A falling quits rate correlates with a loosening labor market, as employees have less opportunity to switch jobs.
- Generally, employee costs follow the quits rate with a lag of roughly nine months.
- The relationship between wage inflation and prices has informed monetary policy for decades.

Source: ARK Investment Management LLC, 2024. Chart data from Macrobond. Information as of April 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.



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.

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.

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.



Glossary Of Terms, Continued

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.

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).



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