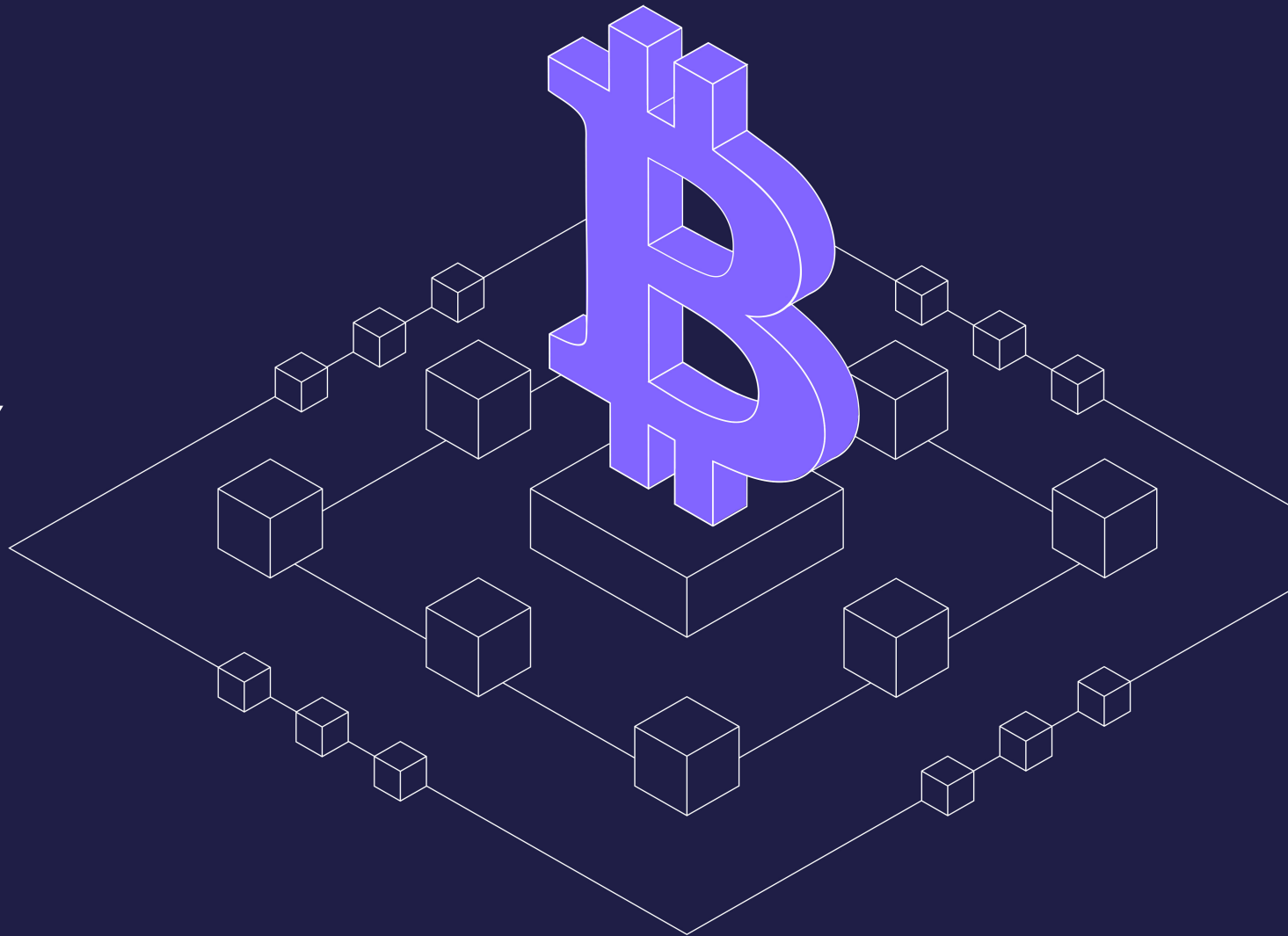




As of May 31, 2023

THE BITCOIN MONTHLY

PRICE CONSOLIDATION HAS CONTINUED



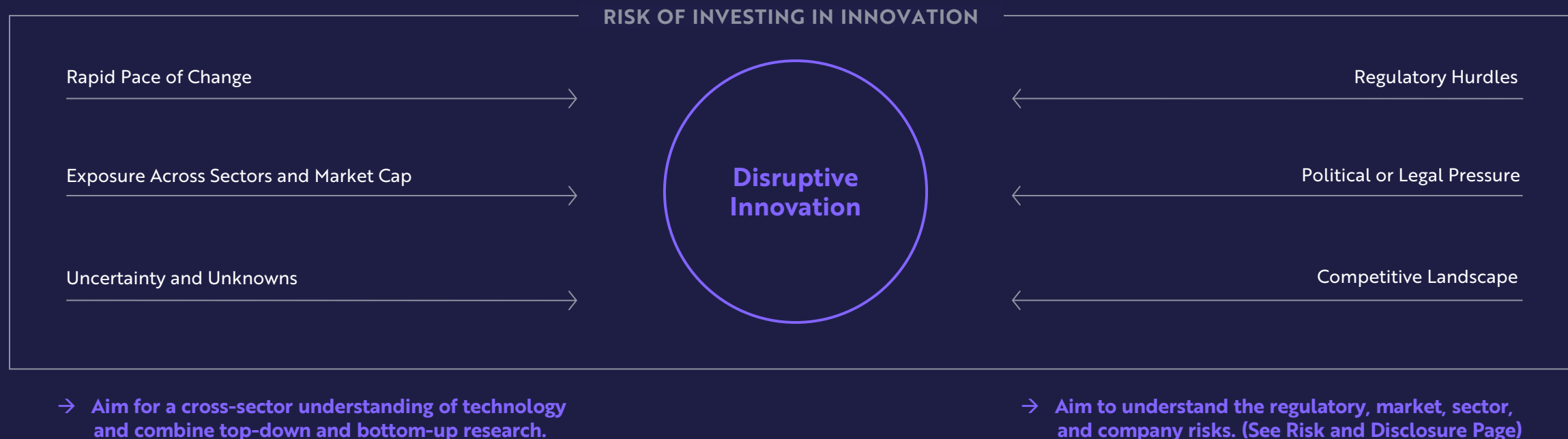
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Please note: Companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. ARK aims to educate investors and seeks to size the potential 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.





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Section 01

Market Summary





Bitcoin Consolidates Amid Strong On-Chain Activity And An Uncertain Macro Environment

On-Chain Activity Remains Healthy As Price Consolidates

- Bitcoin holders appear to be trading at breakeven levels in a market reset.
- Bitcoin's transaction activity spikes as BTC Ordinals continue to gain momentum.
- In the wake of the exit of major market makers like Jane Street and Jump Capital, centralized exchange volumes have declined significantly. Meanwhile, DeFi trading volume relative to total trading volume has hit an all-time high.

Prolonged Monetary Tightening Could Exacerbate Economic Headwinds

- Credit card balances have reached record levels, inching closer to the significant \$1 trillion milestone.
- The demand for Commercial and Industrial (C&I) loans has reached a level that, in the past three instances, has been followed by a recession.

ARK'S KEY TAKEAWAYS

- Bitcoin closed the month of May at \$27,220, down 6.9%, the first monthly loss in 2023.
- Bitcoin's 200 week-moving-average continues to act as crucial support, now at \$25,780.
- Leading macro indicators suggest that a recession is looming.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#) unless otherwise specified. Data valid as of May 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

[Bitcoin Transactions Reach Record High As Inscriptions Surge](#)

[Coinbase Launches International Perps Exchange—Starting With 5x Leverage](#)

[Digital Currency Group Revenue Up From Fourth Quarter, Lags Year Earlier As CFO Steps Down](#)

[Coinbase Aims to Establish International Hub In UAE](#)

[DCG Looks To Refinance Outstanding Genesis Obligations, Raise Growth Capital](#)

[PayPal Discloses Nearly \\$1B Of Crypto Assets On Balance Sheet](#)

[Jane Street, Jump Pull Back Crypto Trading Amid US Crackdown](#)

[The % Of Ethereum Validators Using "Compliant" Relays Has Dropped From 79% To 27%](#)

[Bitcoin Briefly Sheds \\$8 Billion In Market Cap After Binance Quits Canada](#)

[EU's Crypto Legal Framework Inches Towards Law With Finance Ministers' Sign-Off](#)

[Tether To Invest Up To 15% Of Its Profits In Bitcoin](#)

[Beijing Releases White Paper For Web3 Innovation And Development](#)



Bitcoin's Network Activity Remains Positive

	Bitcoin Metrics ¹	Unit	May 2023	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	220	+5.17%	+71.3%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	\$27.8	+3.25%	+1.17%	Bullish	↑
Network Usage	<u>Active Owners</u> ² (Active Entities, 7-Day Moving Average)	Thousands	264.4	-10.74%	+5%	Neutral	↓
	<u>Transaction Volume</u> ² (7-Day Moving Average)	BTC (Thousands)	112.4	+15.9%	-40.04%	Neutral	No Change
Holder Behavior	<u>Long-Term-Holder Supply</u> ² (Coins Held for 155 Days+)	BTC (Millions)	14.45	+0.91%	+6.13%	Bullish	No Change
	<u>Locked Supply</u> ² (Illiquid Supply)	BTC (Millions)	15.11	+0.45%	+6.32%	Bullish	No Change
	<u>Time-Weighted Turnover</u> ² (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	11.1	+59.51%	+26.98%	Neutral	No Change

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

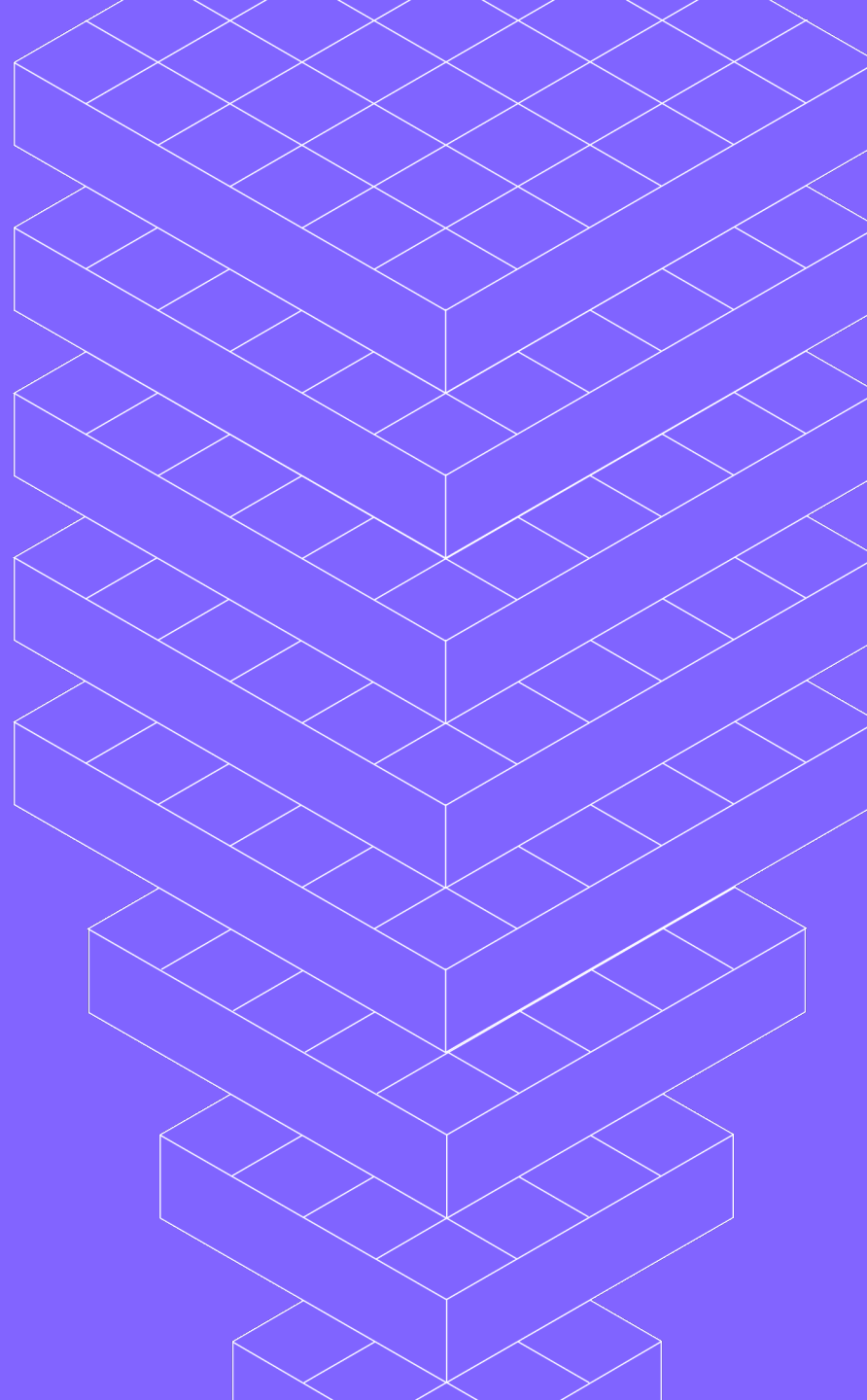


Bitcoin Cost Bases Continue To Rise

	Bitcoin Metrics ¹	Unit	May 2023	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$20,195	+1.2%	-14.88%	Bullish	No Change
	<u>Percent Supply In Profit</u>	pp	67.98%	+5.9 pp	-7.19 pp	Bullish	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$26.017	+6.96%	-19.54%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	3.98%	-0.71 pp	-2.08 pp	Bullish	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated, 7-Day Exponential Moving Average)	pp	-0.05%	-0.01 pp	-0.03 pp	Bullish	No Change
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	2.43%	-0.05 pp	-1.04 pp	Bullish	No Change

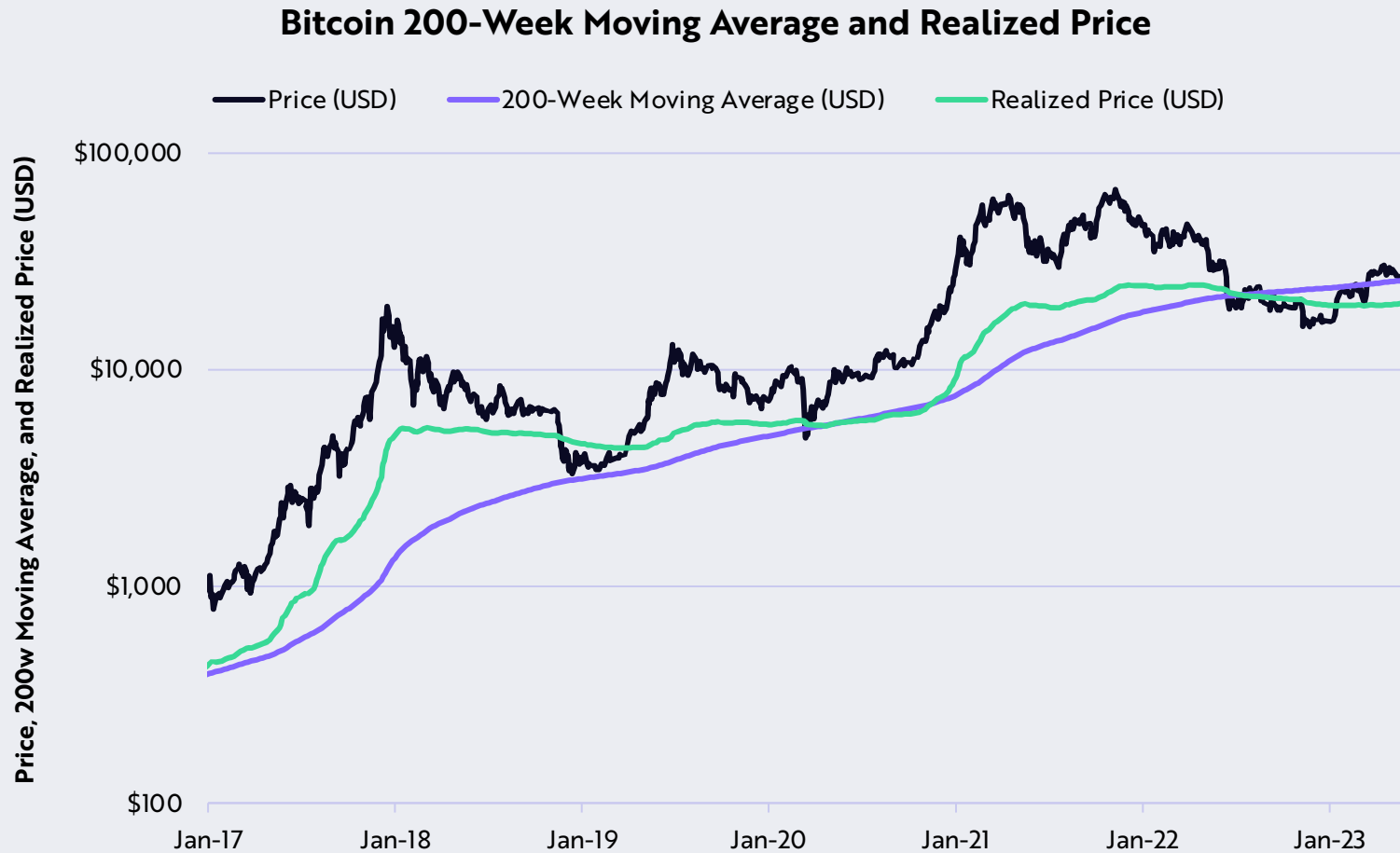
[1] For more information on these metrics and their units of account, please read the Appendix: Glossary of Terms on page 20 of this report. [2] Data may be subject to change over time since they are entity-adjusted in real time via a machine-learning algorithm. [3] Arrows displayed in the "Upgrade/Downgrade"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

On-Chain Activity Remains Healthy As Price Consolidates





Bitcoin's 200-Week Moving Average And Realized Price Are Important Levels Of Support



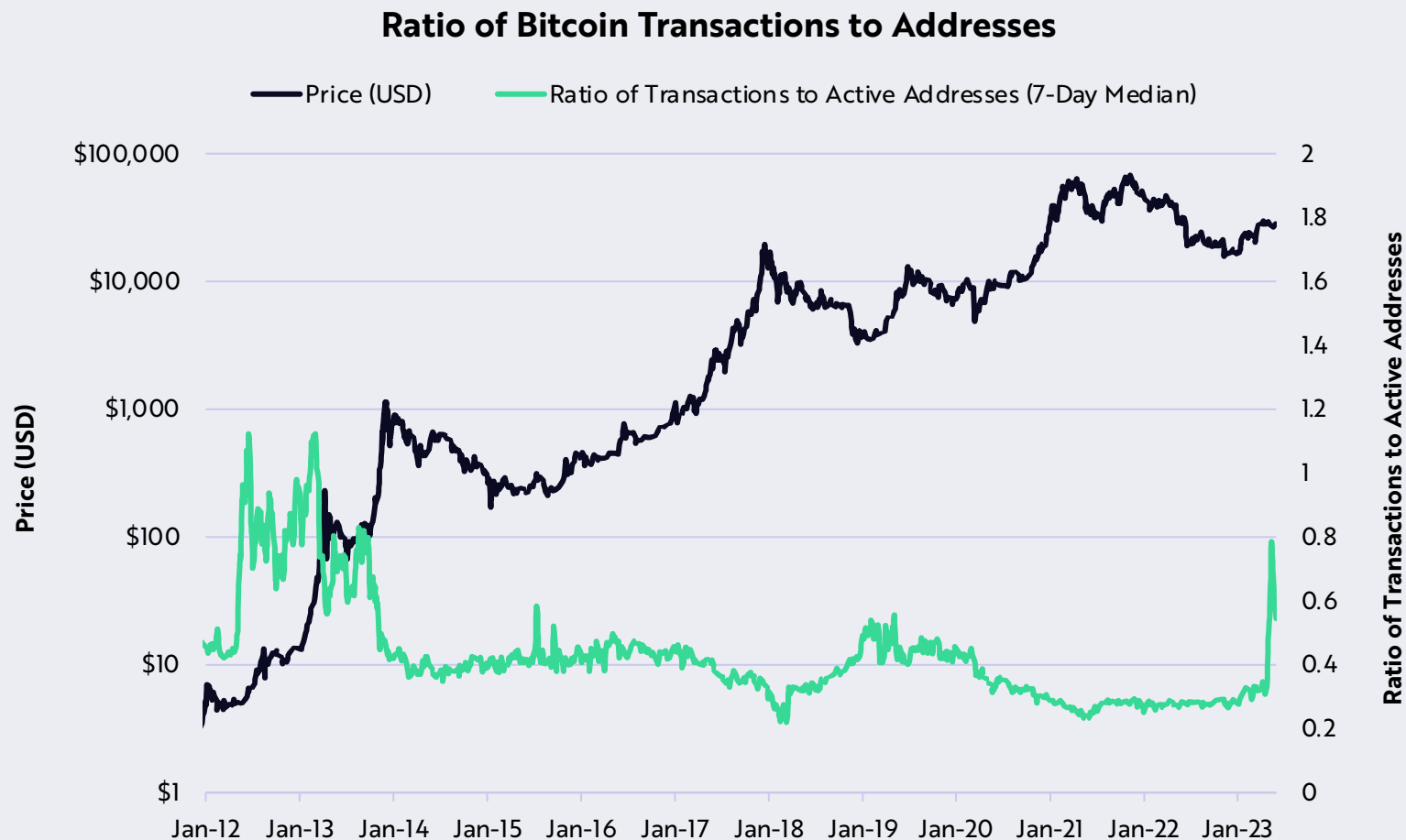
ARK'S VIEW: BULLISH

- In May, bitcoin repeatedly tested its 200-week moving average (\$25,870), a crucial support level.
- In the event of a deeper correction, bitcoin's market cost basis, or realized price, stands at \$20,200, marking the next level of high-conviction support.

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



Atypically, The Number Of Bitcoin Addresses Is Diverging From The Number Of Transactions



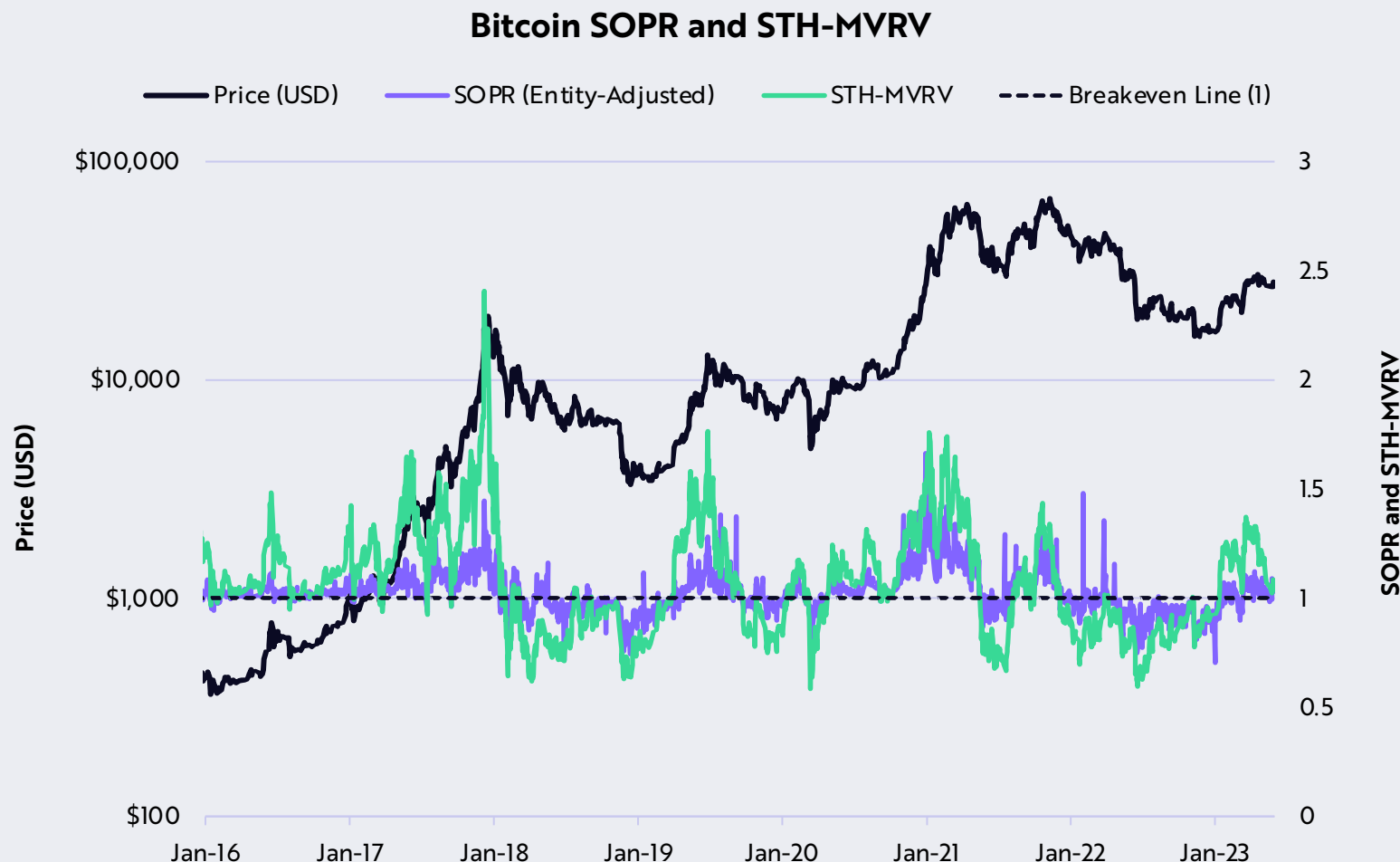
ARK'S VIEW: NEUTRAL

- As Ordinals and BRC-20 tokens flourish in the Bitcoin network, transactions and addresses—metrics that usually are highly correlated—diverged dramatically.
- Why? Just as the minting of Ordinals and BRC-20 tokens massively increased transaction count, the production of BRC-20s incentivized users to reuse addresses, skewing transaction count disproportionately.
- During May, the ratio of transactions to active addresses hit 0.78, its highest value since 2013.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of May 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 Market Nears Breakeven Levels



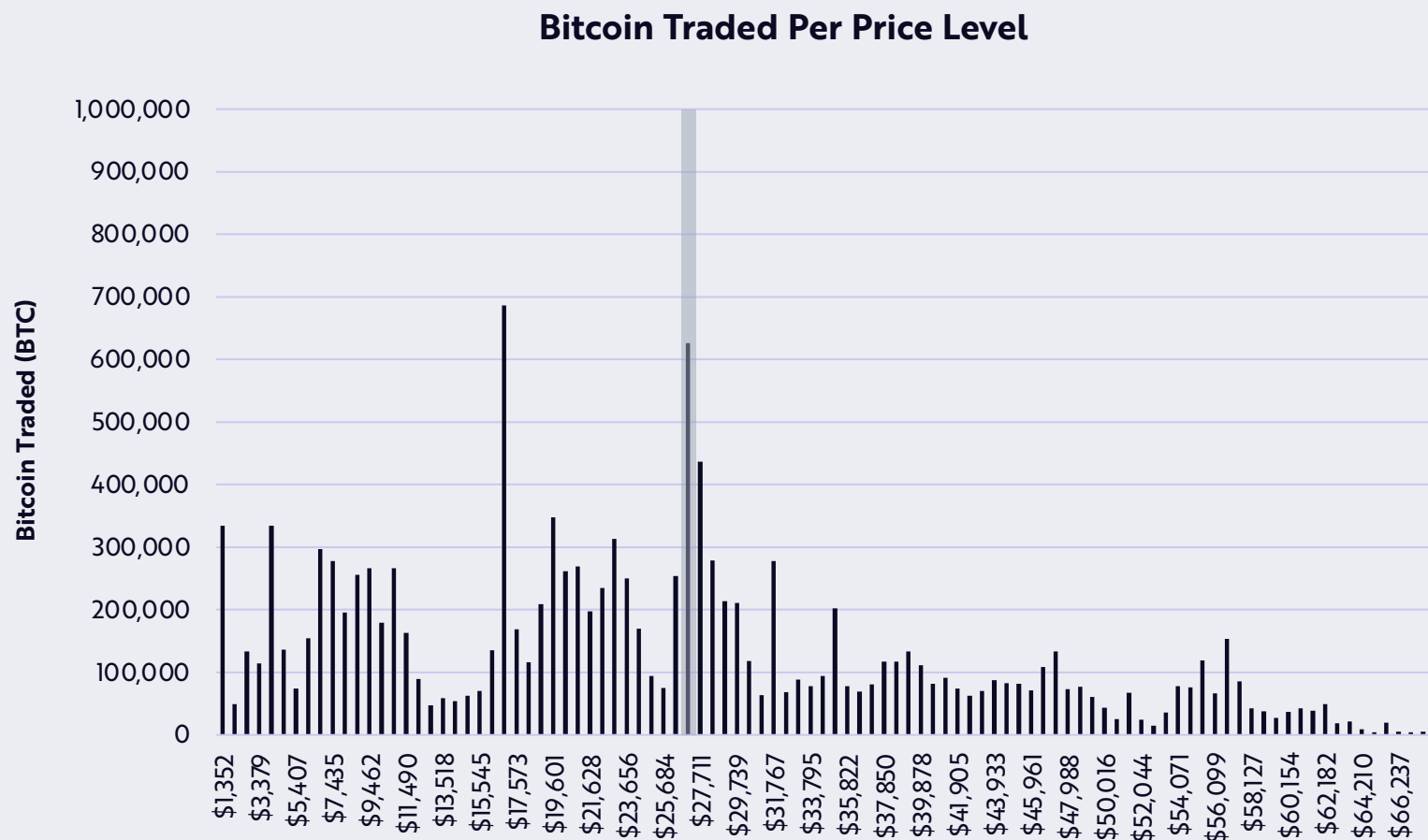
ARK'S VIEW: BULLISH

- Both the spent output price ratio (SOPR) and the short-term-holder market-value-to-realized-value (STH-MVRV) ratio are at or near 1, historically indicating that the market is at breakeven.
- According to our research, in the context of bull markets, when SOPR and STH-MVRV fall back to 1, price typically has found a local bottom.

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 May 30, 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.



Its Realized Price Distribution Suggests That Holders Have Accumulated Bitcoin Between \$26,000 And \$27,000



ARK'S VIEW: BULLISH

- Bitcoin's realized price distribution measures the number of bitcoin traded at all price levels, from \$0 to its all-time high.
- In May, bitcoin found support between \$26,000 and \$27,000, the level at which the third-largest¹ quantity of coins has changed hands historically, and where buyers may defend their positions.

[1] The largest quantity of coins (over 3.9 million) traded at or below 680 USD, and this data is not shown on the chart above.

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 May 29, 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.



DeFi Trading Volumes Continue To Gain Share



ARK'S VIEW: NEUTRAL

- Despite overall trading volumes declining 27% month-over-month, decentralized exchange volume grew 12%, reaching a record-high share relative to volume on centralized exchanges.
- With \$65 billion in volume during May, decentralized exchanges are roughly on-par with the \$69 billion USD-denominated centralized exchange volumes.
- In our view, the share gain is a clear sign of activity moving on-chain and off-shore.

Source: ARK Investment Management LLC, 2023. Chart data from The Block. Information as of May 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.



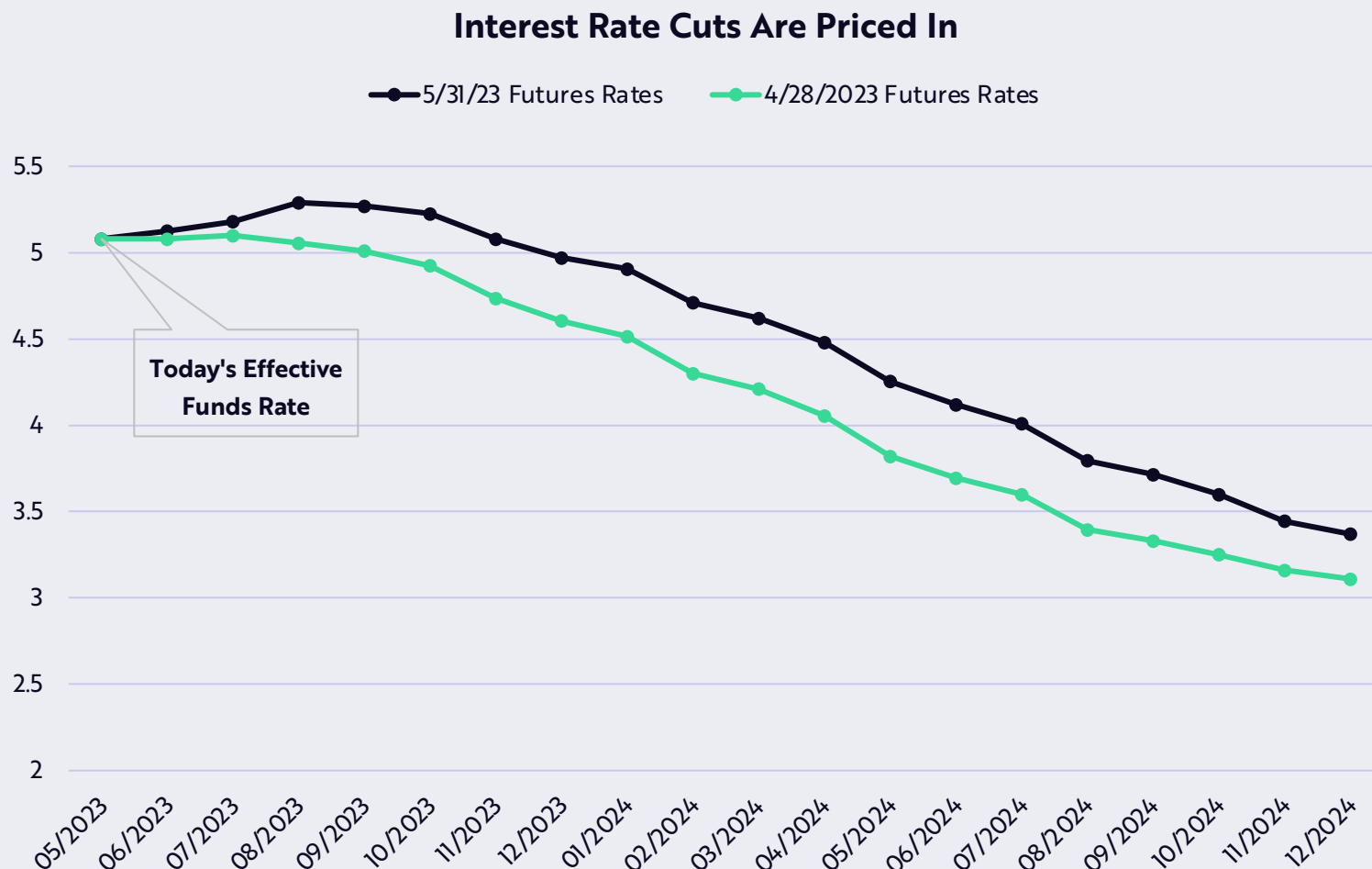
Section 03

Prolonged Fed Tightening Could Exacerbate Economic Headwinds





Interest Rate Futures Are Pricing In A Slowdown Or Recession



ARK'S VIEW: NEUTRAL

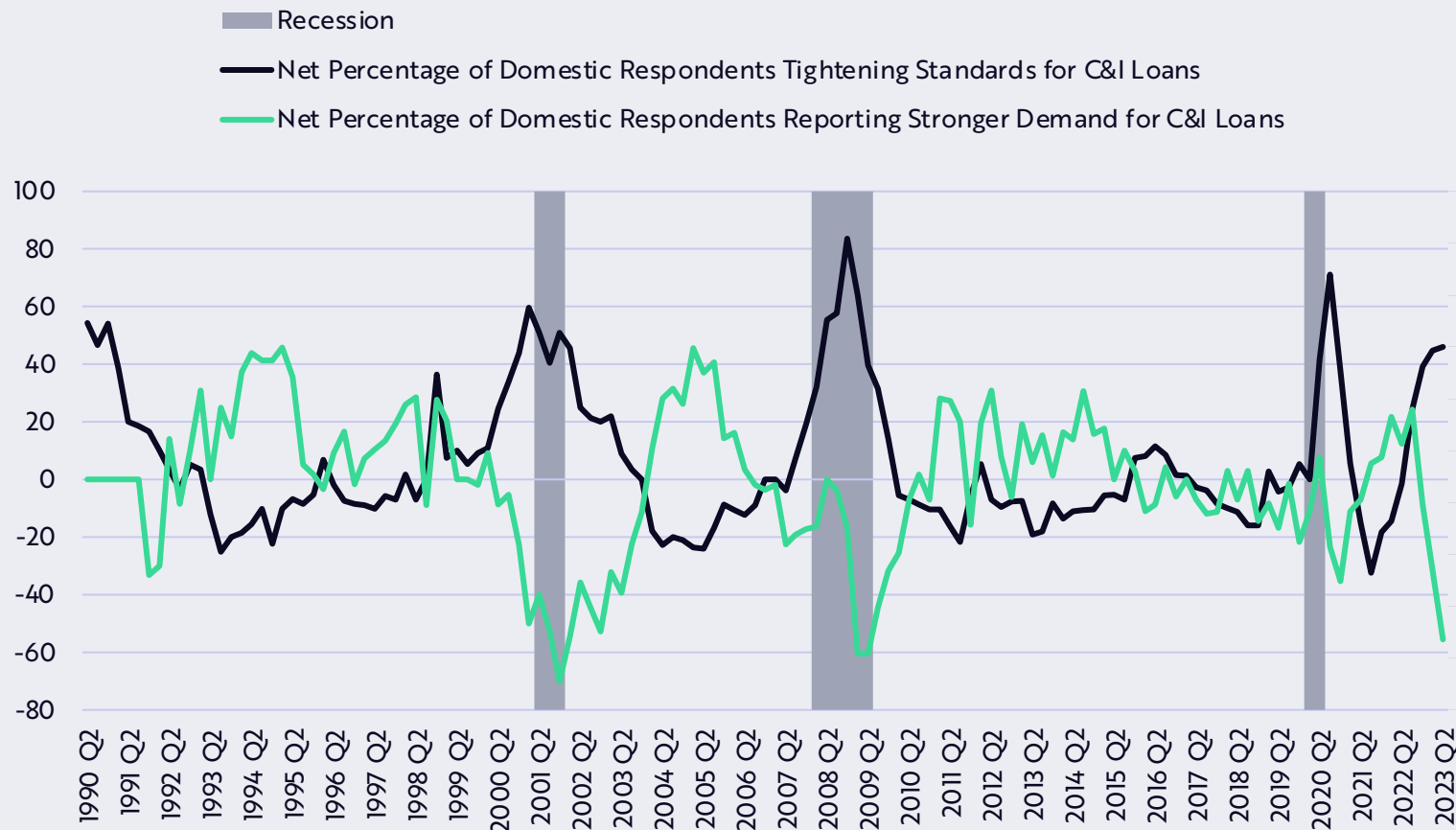
- Because of recent economic data and comments from the U.S. Federal Reserve, investors now seem to expect a slower pace of interest rate cuts.
- As mounting evidence suggests the US is headed toward a slowdown, the market is expecting just two more rate hikes before interest rates decline.
- Should the slowdown accelerate into a hard landing, which leading indicators are suggesting, the slope of the interest rate decline could steepen.

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



Banks' Willingness To Lend Is Plummeting

Senior Loan Officer Opinion Survey on Large/Medium Bank Lending Practices



ARK'S VIEW: BEARISH

- Borrowing and lending play a pivotal role in running a smooth economy. A halt in these activities often indicates an impending recession.
- Recession occurred the last three times that demand for commercial and industrial (C&I) loans reached current levels.
- The Bank of America Fund Manager Survey¹ suggests that Commercial Real Estate could be the epicenter of the next financial crisis.

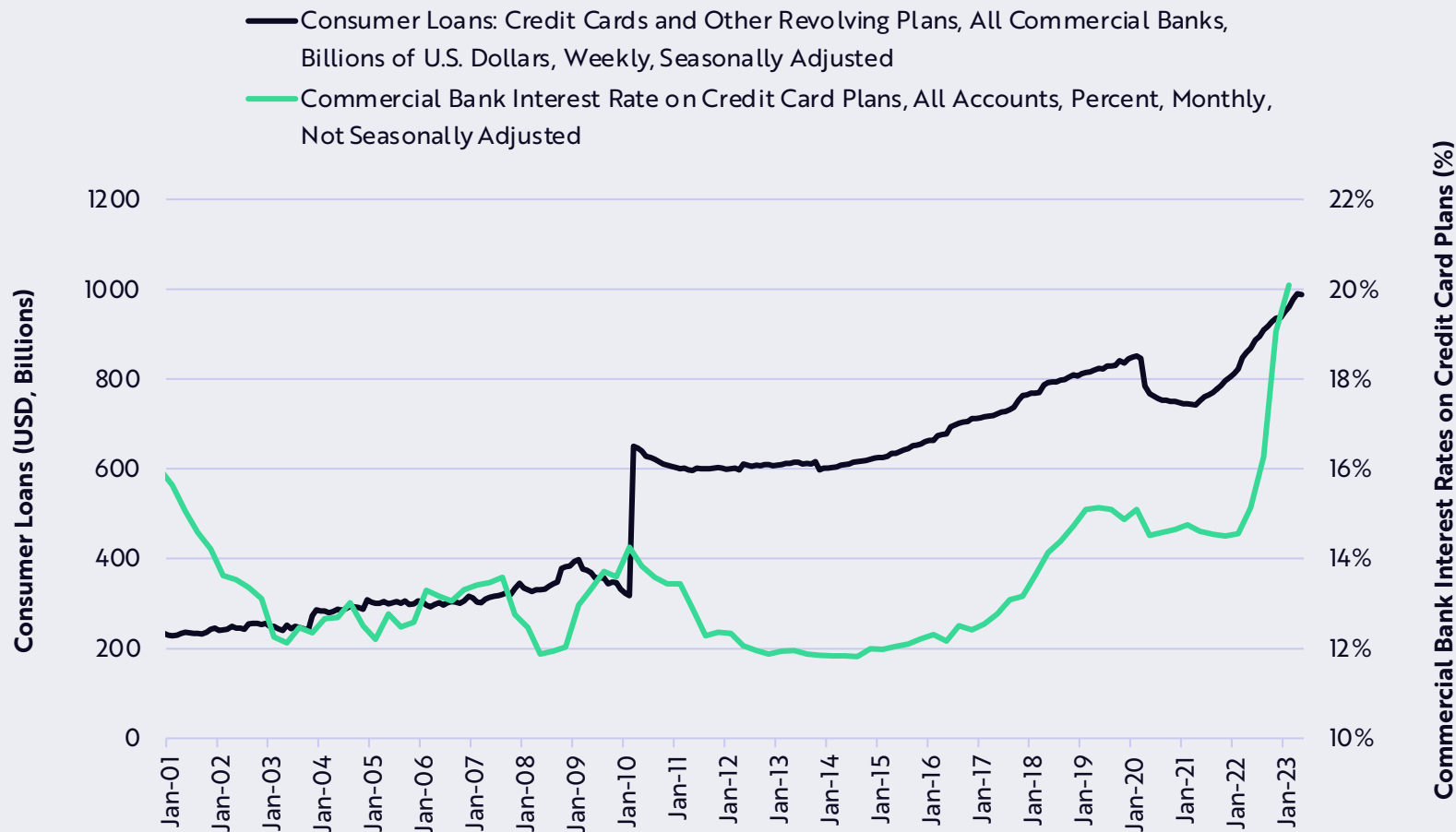
[1] Bank of America Global Fund Manager Survey. May 16, 2023.

Source: ARK Investment Management LLC, 2023. Chart data from Federal Reserve. Information as of May 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.



Approaching \$1 Trillion, Credit Card Balances Have Hit A Record Level

Credit Card Balances Rise Despite Higher Interest Rates



ARK'S VIEW: BEARISH

- Credit card balances have reached record levels, closing in on \$1 trillion USD.
- Among non-housing debt, credit card balances are the third largest.
- Interest rates on credit cards have surged to 21%, increasing the burden of credit card debt.

Source: ARK Investment Management LLC, 2023. Chart data from the U.S. Federal Reserve. Information as of May 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: 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.

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

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

Long-term Holding and Holders (LTH): Related to supply last moved 155 days ago or more, the threshold at which the possibility of a bitcoin 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 and price bought for the coins that moved that day. Also known as spent output ratio, or SOPR.

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

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.



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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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