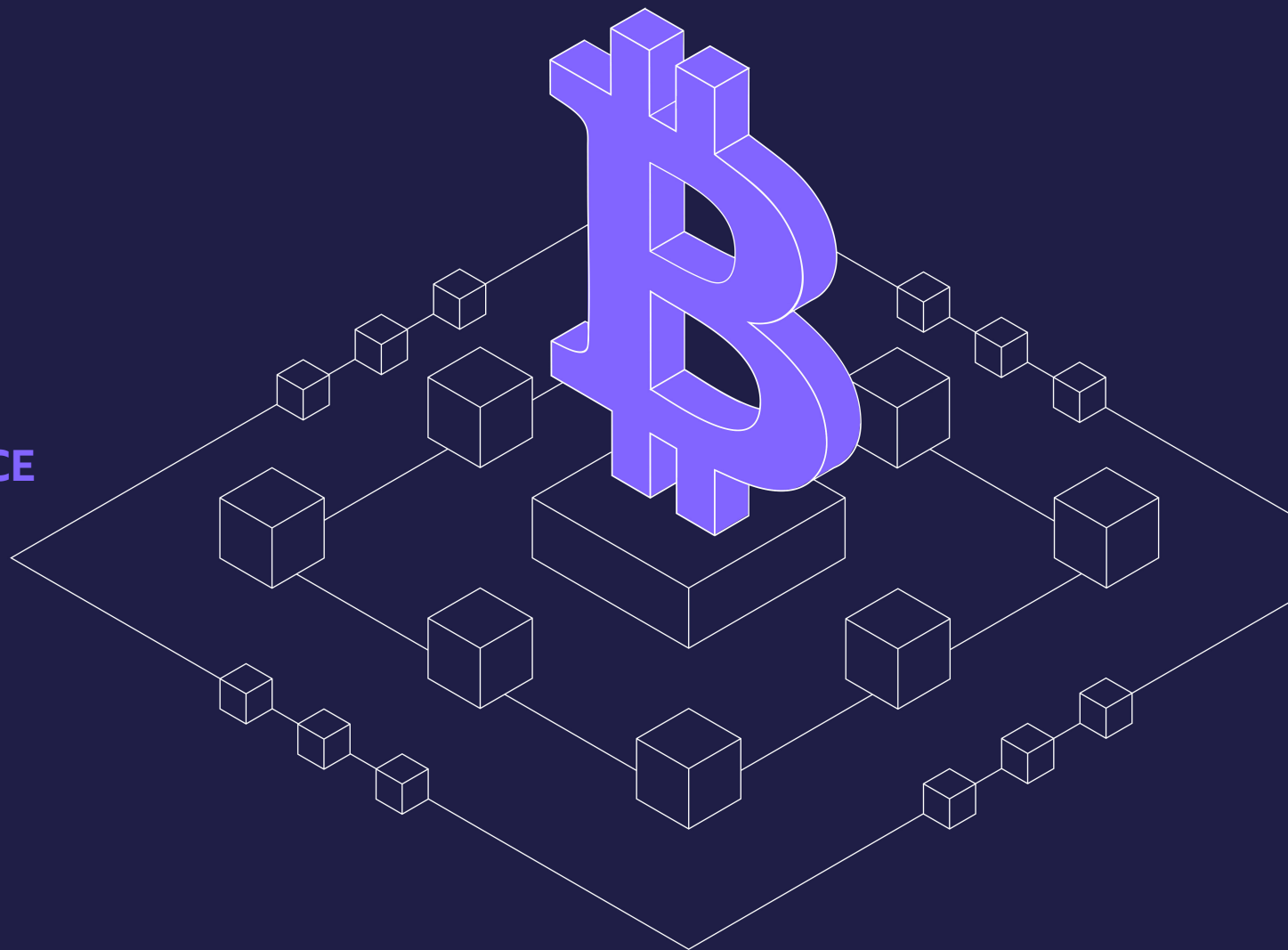




As of September 30, 2023

THE BITCOIN MONTHLY

BITCOIN STRENGTH CHALLENGES RESISTANCE



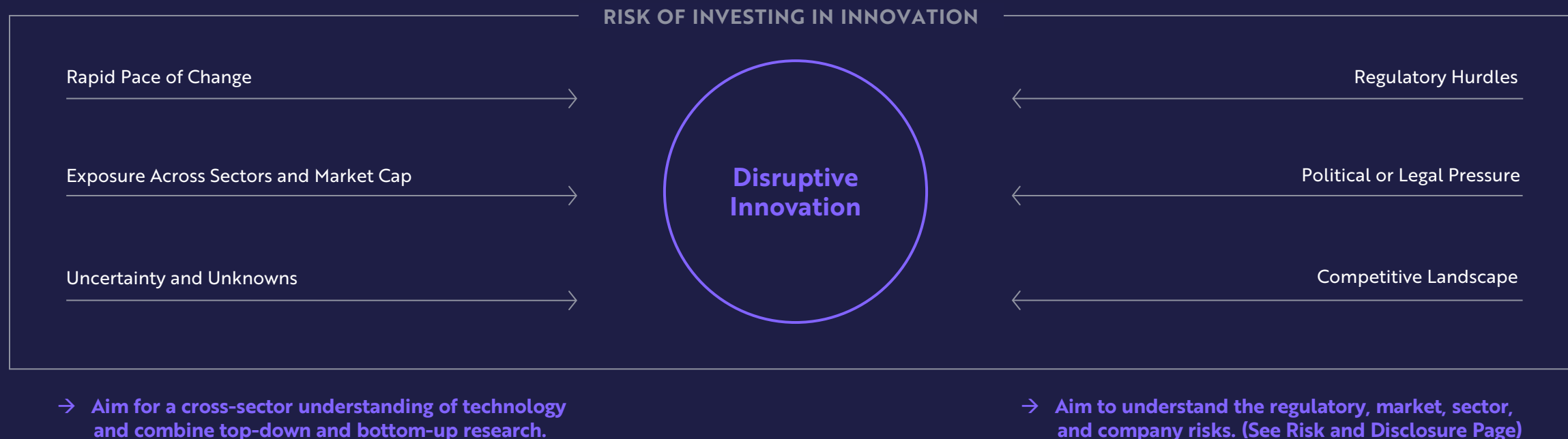
For Informational Purposes Only. ARK Investment Management LLC, 2023. This is not investment advice or a recommendation in relation to any named particular securities or cryptocurrencies and no warranty or guarantee is provided. Any references to particular securities or cryptocurrencies are for illustrative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



RISKS OF INVESTING IN INNOVATION

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

Please read risk disclosure carefully.





SECTIONS

01

Market Summary

02

Healthy On-Chain Activity Meets Technical Resistance

03

Higher Rates, Oil Prices, And USD Pose Macroeconomic Challenges

04

Appendix: Glossary Of Terms



Section 01

Market Summary





After A Positive Month, Technical Resistance Could Become Support For Bitcoin's Price

Bitcoin's Strong Fundamentals Suggest That Its Price Could Break Through Resistance

- In September, bitcoin's price closed slightly below both its 200-week moving average (\$27,375) and its short-term holder cost basis (\$27,806). A break above those resistance levels would validate the bull market.
- During September, long-term holders of bitcoin accounted for ~76% of circulating supply, an all-time high since 2010.
- Limited profits on-chain suggested that the bitcoin price was oversold.

Macroeconomic Challenges Are Likely To Persist

- Rising interest rates and oil prices are eroding market liquidity and consumer disposable income.
- In our view, the strong dollar and worrisome leading economic indicators are foreshadowing a global recession.

ARK'S KEY TAKEAWAYS

- In September, the price of bitcoin rose 4% to \$26,970.
- Catalyzed by the approval of an ether futures ETF and the U.S. Securities and Exchange Commission's (SEC's) losses in court, bitcoin sentiment seems to be turning positive.
- Sustained increases in interest rates and oil prices could place a limit on economic activity, which a stronger dollar could compound in the rest of the world.

Source: ARK Investment Management LLC, 2023. Data from [Glassnode](#) unless otherwise specified. Data valid as of September 30, 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.



News Of The Month

<u>Coinbase To Launch New Lending Platform Aimed At Large Institutional Investors</u>	<u>Celsius Creditors Vote In Favor Of Reorganization Plan</u>
<u>Genesis Global Capital Files For Over \$600M In Unpaid DCG Loans</u>	<u>Taiwan Releases Guidelines For Crypto Exchanges, Restricts Offshore Exchanges Unless Compliant</u>
<u>Cboe's BZX Exchange Files To Launch Ark 21Shares, VanEck Spot Ether ETFs</u>	<u>MoneyGram Unveils Non-Custodial Wallet To Bridge The Worlds Of Crypto And Fiat Currency With USDC</u>
<u>PayPal Rolls Out Crypto-For-USD Conversion Service</u>	<u>SEC Delays ARK 21Shares Bitcoin ETF Decision Until 2024</u>
<u>Banking Powerhouse HSBC Working With Crypto Custody Firm Fireblocks</u>	<u>Binance Fully Exits Russia With Sale To CommEX</u>
<u>Sam Bankman-Fried Loses Bid For Pretrial Jail Release</u>	<u>Crypto Exchange Kraken To Offer US-Listed Stocks' Trading</u>
<u>Binance.US Cuts Staff, CEO Departs</u>	<u>SEC Delays Decisions On Proposed Ethereum ETFs From ARK, VanEck</u>
<u>FTX Tweaks Crypto Sale Proposal To Placate US Government</u>	<u>Coinbase Rolling Out Perpetual Futures Trading For Retail Users Outside US</u>
<u>Coinbase To Integrate Lightning Network</u>	<u>Three Arrows Capital Co-Founder Zhu Arrested In Singapore, Sentenced Four Months In Prison</u>
<u>Judge Approves Order Allowing FTX To Start Selling Crypto</u>	
<u>Genesis Has Ceased All Crypto Trading Services</u>	
<u>Hong Kong Looks To Release Stablecoin Regulations By Mid-2024</u>	
<u>Mt. Gox Delays Repayment Deadline For Another Year</u>	
<u>MicroStrategy Acquires An Additional 5,445 BTC</u>	



Despite Technical Resistance, On-Chain Activity Remains Net Positive

	Bitcoin Metrics ¹	Unit	September 2023	1M Change	1Y Change	ARK's View	Upgrade/Downgrade ³
Network Security	<u>Mining Difficulty</u>	Exahash/sec ¹ (Thousands)	245	+2.6%	+82.1%	Bullish	No Change
	<u>Miner Revenue</u> (7-Day Moving Average)	USD (Millions)	\$24.8	+10.1%	+37.6%	Bullish	No Change
Network Usage	<u>Active Owners</u> ² (Active Entities, 7-Day Moving Average)	Thousands	275.5	-3.3%	+15.9%	Bullish	No Change
	<u>Transaction Volume</u> ² (7-Day Moving Average)	BTC (Thousands)	115.8	-5.3%	-37.9%	Bearish	↓
Holder Behavior	<u>Long-Term-Holder Supply</u> ² (Coins Held for 155 Days+)	BTC (Millions)	14.84	+1.06%	+8.05%	Bullish	No Change
	<u>Locked Supply</u> ² (Illiquid Supply)	BTC (Millions)	15.3	+0.31%	+6.2%	Bullish	No Change
	<u>Time-Weighted Turnover</u> ² (Coindays Destroyed, 7-Day Median)	Coindays (Millions)	6.44	-5.9%	-22.2%	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. Information as of September 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.



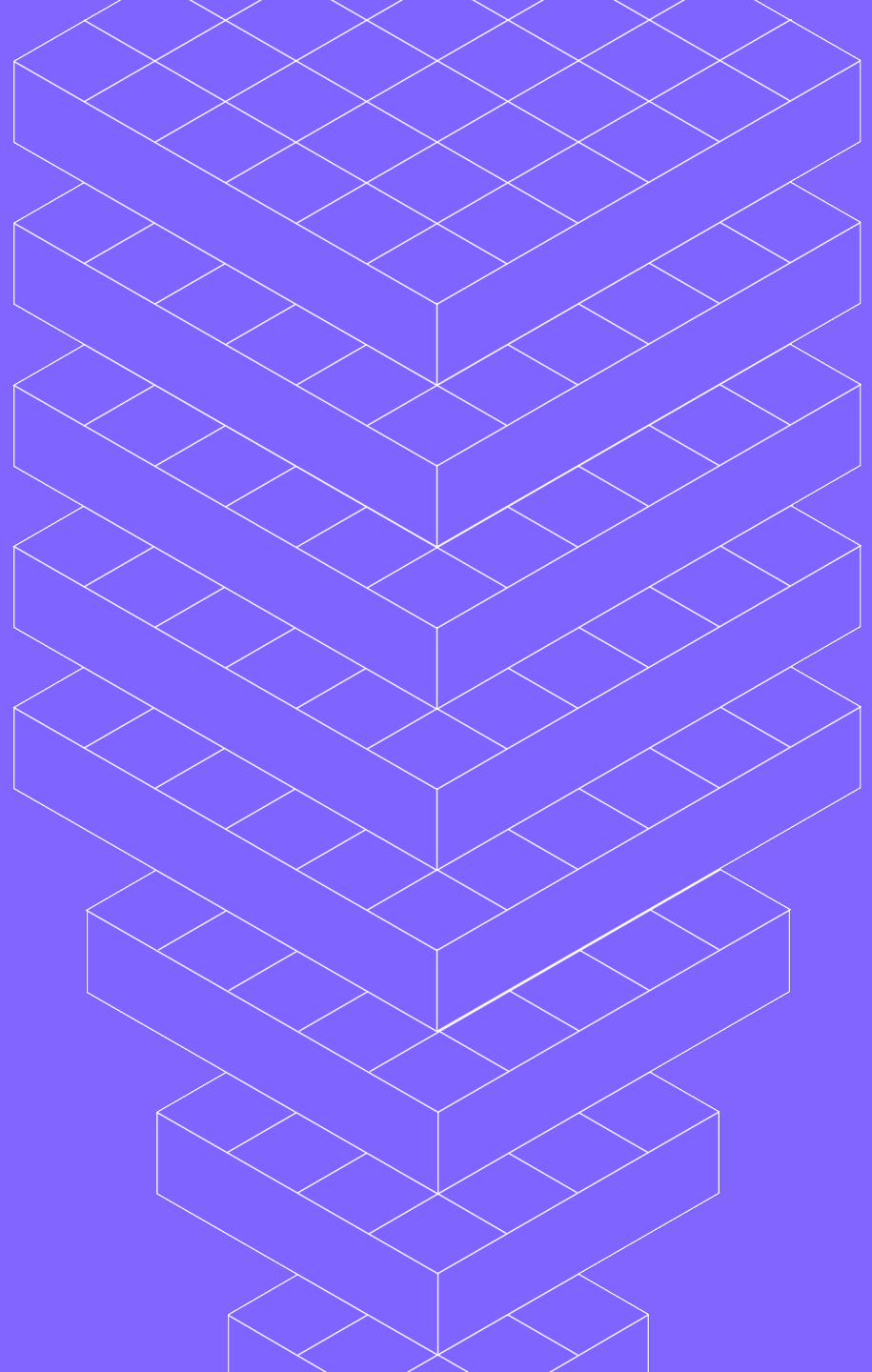
Despite Its Profitability, Bitcoin's Market Cost Basis Is Neutral

	Bitcoin Metrics ¹	Unit	September 2023	1M Change	1Y Change	ARK's View	Upgrade/ Downgrade ³
Long-Term Valuation	<u>Market Cost Basis</u> (Realized Price)	USD	\$20,288	-0.02%	-4.5%	Neutral	No Change
	<u>Percent Supply In Profit</u>	pp	66.5%	+6.9 pp	+12.9 pp	Bullish	No Change
Short-Term Valuation	<u>Short-Term-Holder Cost Basis²</u> (STH Realized Price)	USD	\$27,806	-1.5%	+23.4%	Bullish	No Change
	<u>Realized Market Returns²</u> (SOPR-1, 7-day moving average)	pp	-0.009%	+1.5 pp	+7.04 pp	Bullish	No Change
Market Sentiment	<u>Perpetual Futures Basis</u> (Binance, Estimated, 7-Day Exponential Moving Average)	pp	-0.05%	0.0 pp	0.0 pp	Bullish	No Change
	<u>Expirational Futures Basis</u> (Quarterly, All Exchanges, Annualized)	pp	3.69%	-0.15 pp	+2.8 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 September 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.

Section 02

Healthy On-Chain Activity Meets Technical Resistance





The Bitcoin Price Hit Technical Resistance In September

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



ARK'S VIEW: NEUTRAL

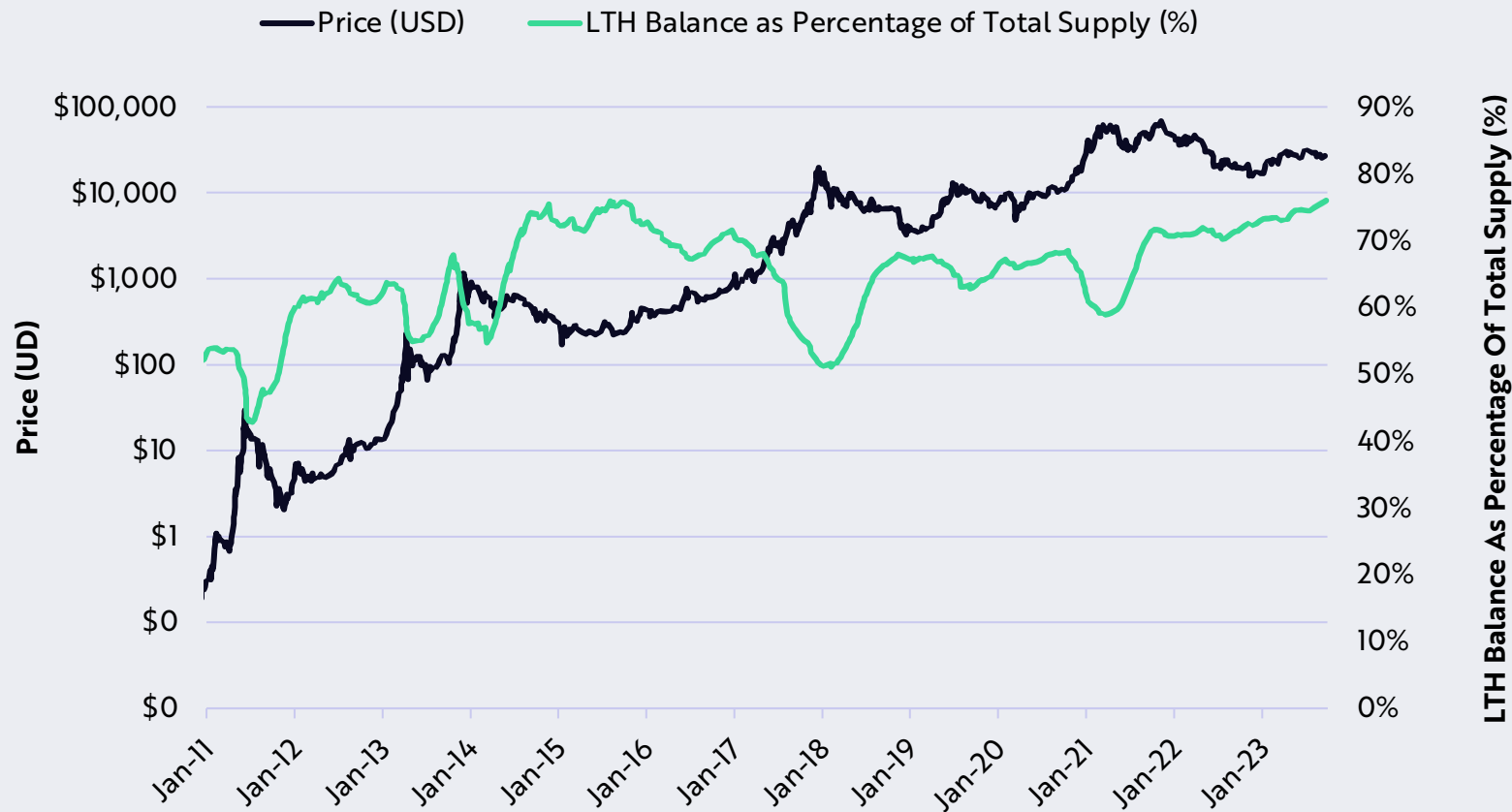
- The bitcoin price increased 4% to \$26,970 in September.
- Its price closed ~1.5% below its 200-week moving average (\$27,375) and 3% below the cost basis of short-term holders (\$27,806), both of which suggest resistance.
- Downside support is \$20,289, bitcoin's cost basis and realized price.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of September 30, 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.



Long-Term Balances As A Percent Of Total Supply Reached Their Highest Since 2010

Bitcoin Long-Term-Holder Balance as Percentage of Total Supply



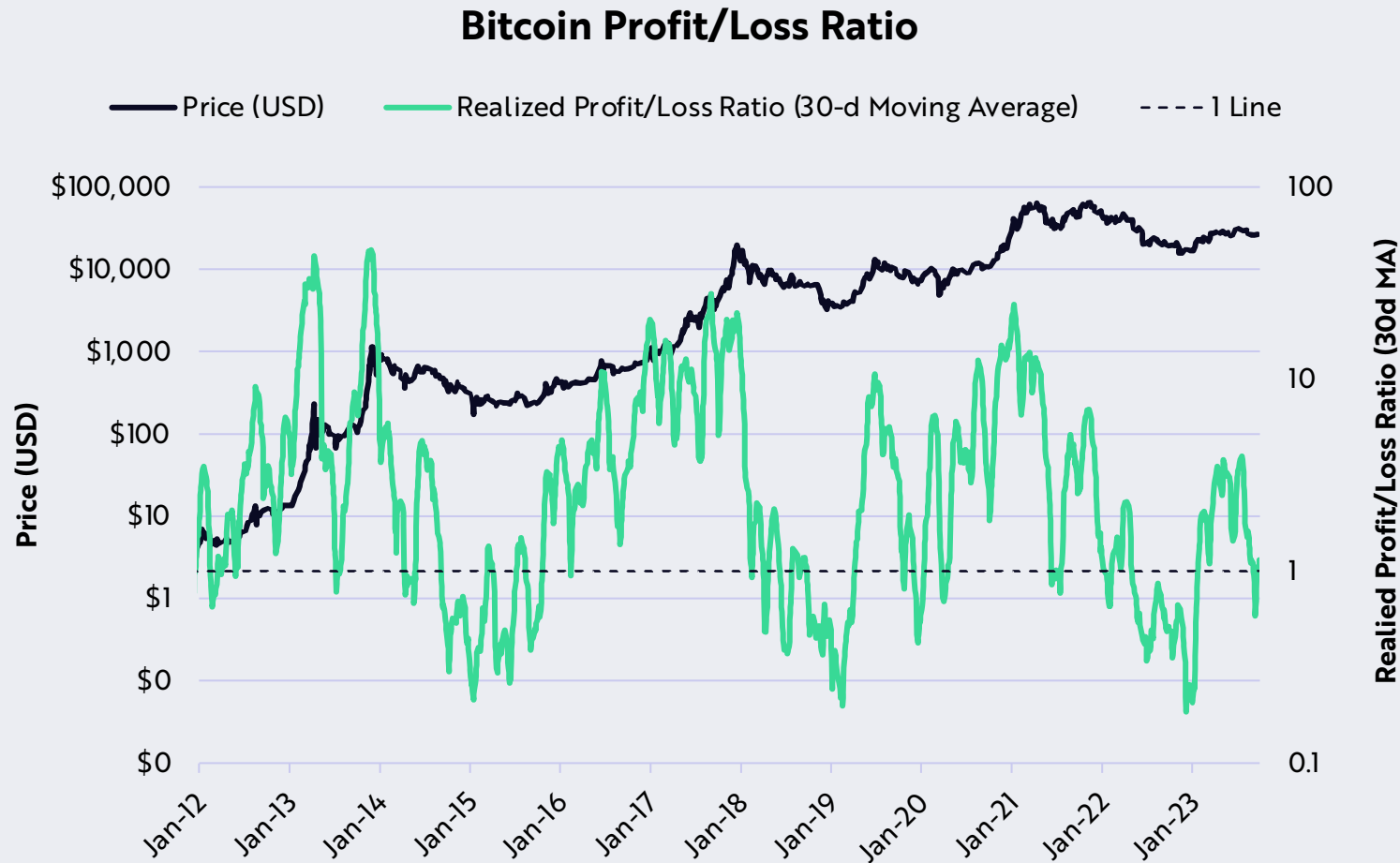
ARK'S VIEW: BULLISH

- In September, the supply of bitcoin held by long-term holders (LTH)—those holding the asset for 155 days or more—hit 76%, its all-time high since 2010.
- Bitcoin's long-term holder base increased 4.44 percentage points, or 6.2% on a year-over-year basis, in September.

Source: ARK Investment Management LLC, 2023. Chart data from [Glassnode](#). Information as of September 30, 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.



The Ratio Of Coins Moved At A Profit To Coins Moved At A Loss Was ~1:1 In September



ARK'S VIEW: BULLISH

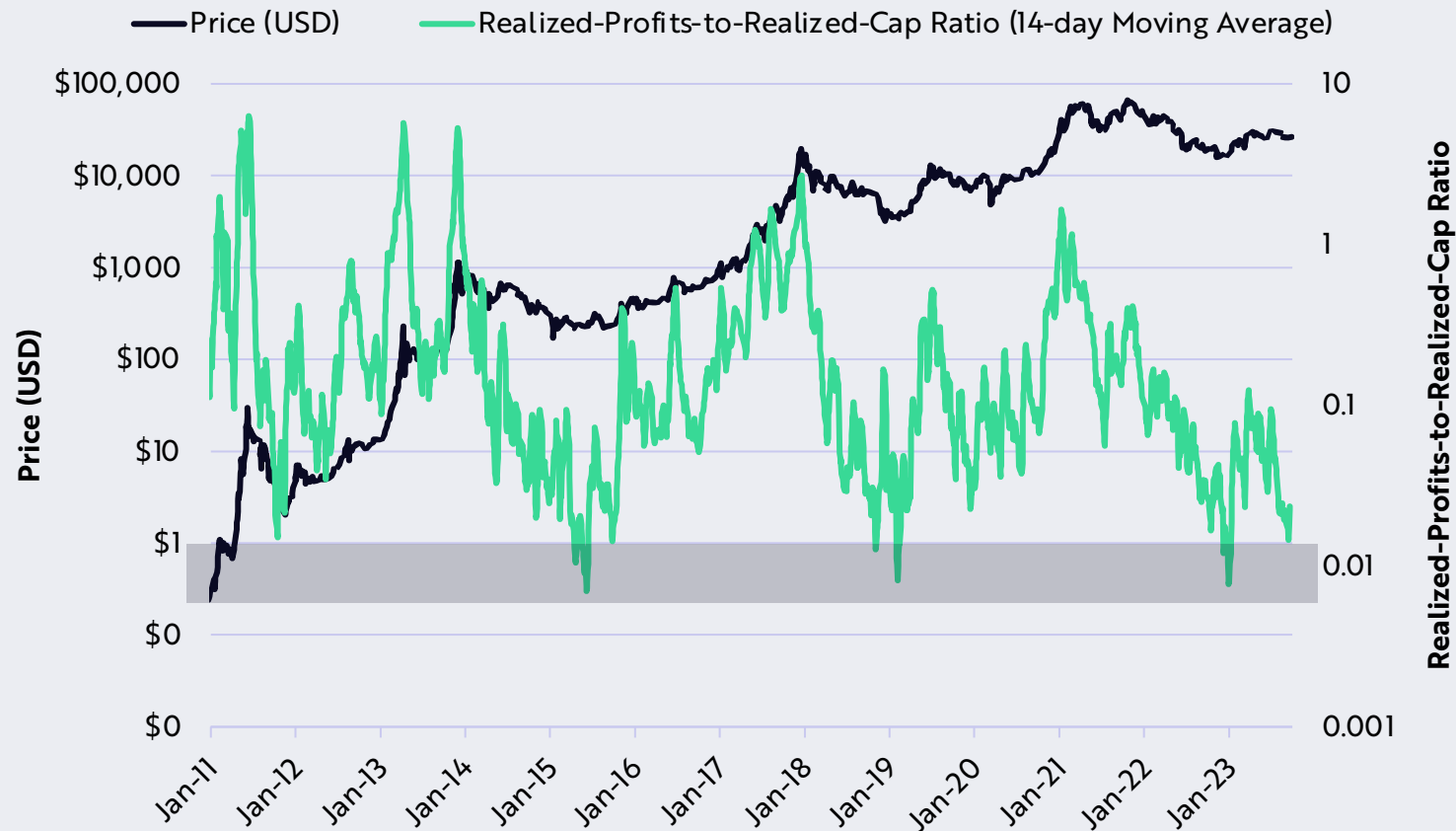
- In September, the ratio of realized profits to realized losses approximated 1.13 as measured by a 30-day moving average. In other words, coins transacted at profit nearly matched coins transacted at loss, suggesting little exuberance relative to the first half of the year.

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



Bitcoin Appears Oversold Cyclically Now That Realized Profits Are ~0.02% Of Its Cost Basis

Bitcoin Realized-Profits-to-Realized-Cap Ratio



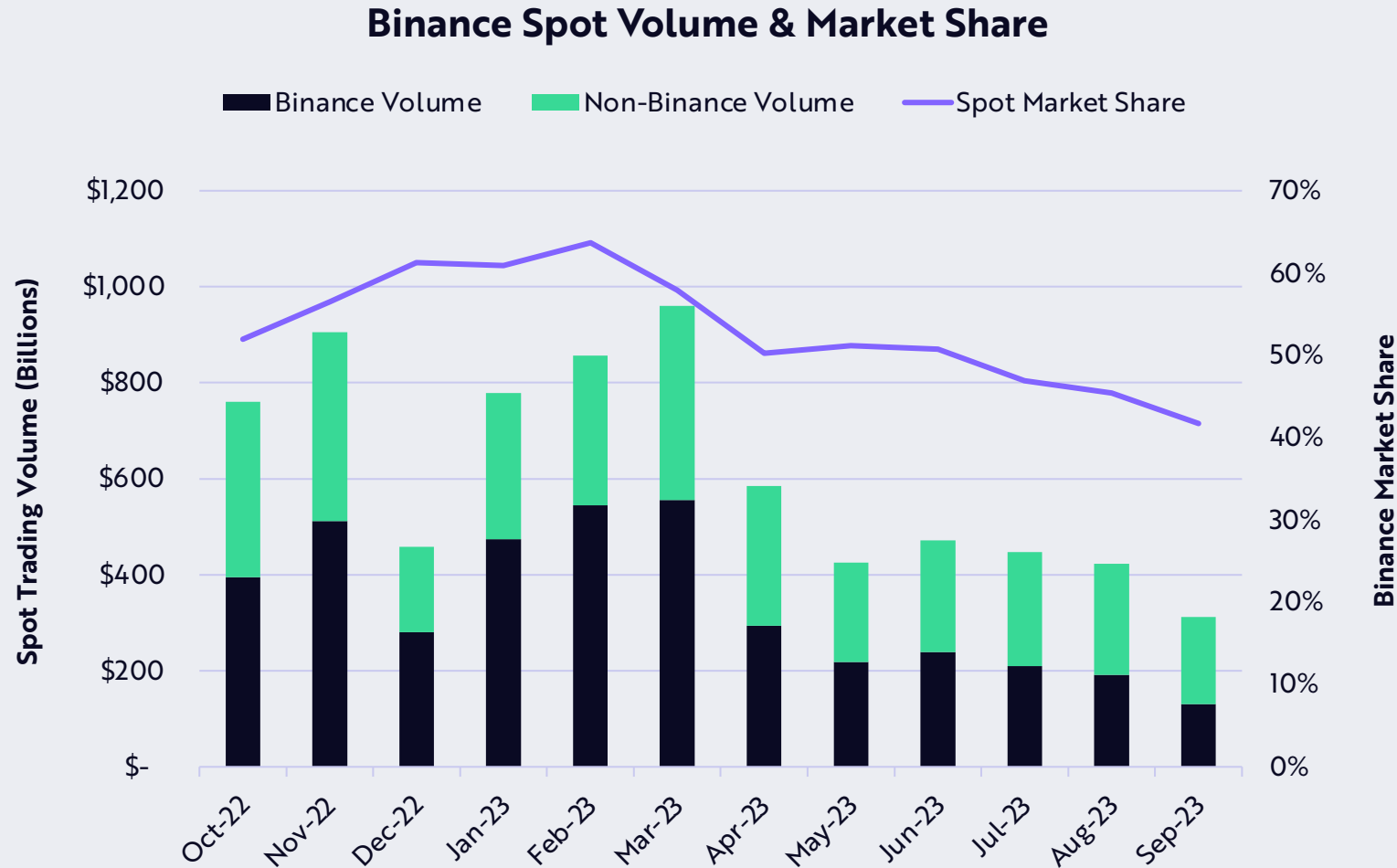
ARK'S VIEW: BULLISH

- The ratio of realized profits to realized cap measures bitcoin's profit-taking against its cost basis.
- Bitcoin's Realized-Profits-to-Realized-Cap closed September at 0.02%, slightly above 0.01%, its yearly low. This oversold condition has occurred only seven times in bitcoin's history.

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



As Regulatory Pressures Mount, Binance Is Losing Market Share



ARK'S VIEW: BULLISH

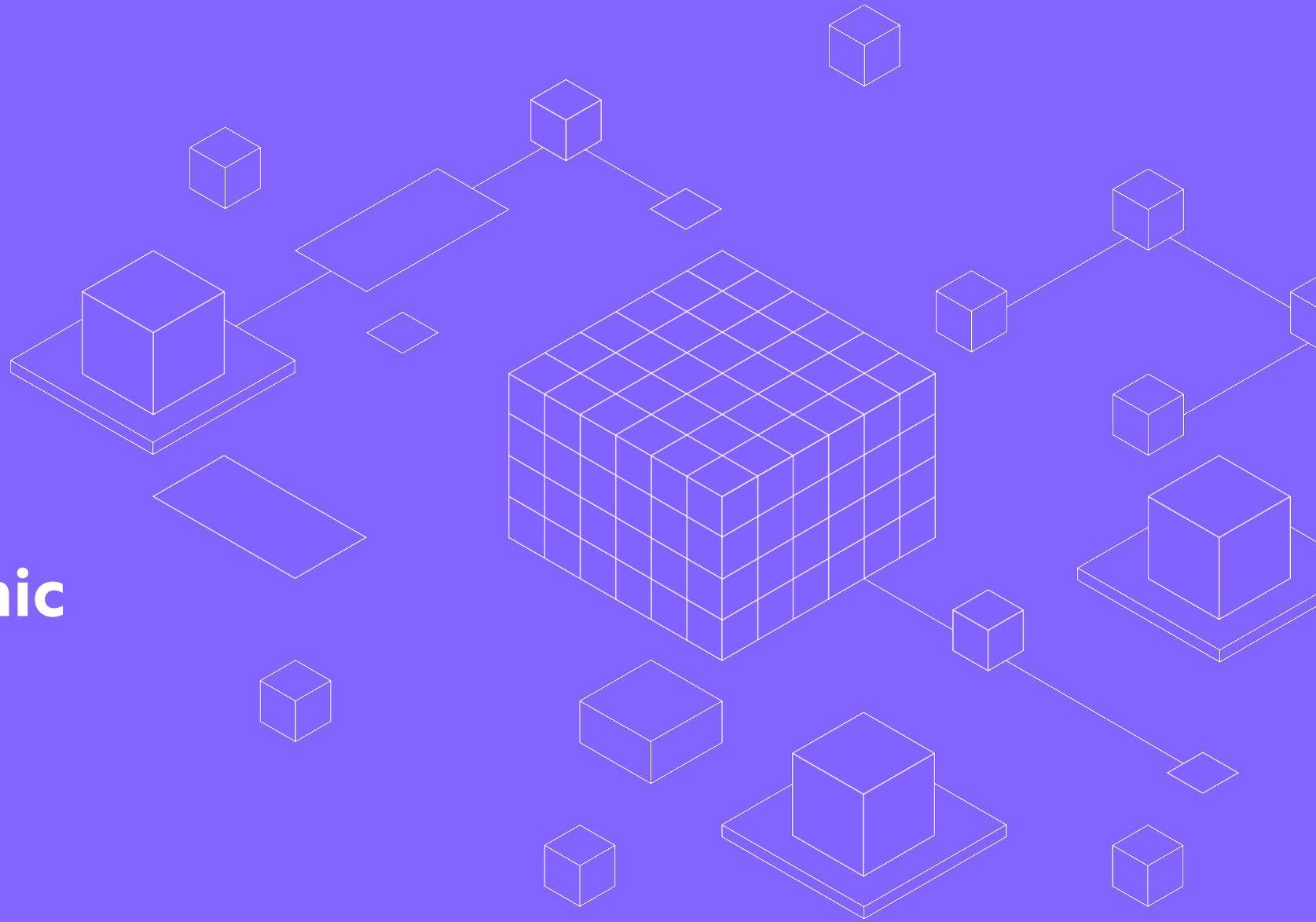
- After short-term gains in the aftermath of FTX's collapse, Binance's share of global cryptoasset spot trading volume dropped from 64% at its peak in February to 42% in September.
- The SEC [filed 13 charges](#) against Binance in June alone, and the company has [lost key executives](#), including its Head of Product, Chief Strategy Officer, and General Counsel. In addition, in recent months Binance either ceased operations or did not obtain licenses to operate in a number of countries, including the UK, Netherlands, and Germany.
- At this point, a gradual decline in market share could be the best case for Binance.

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



Section 03

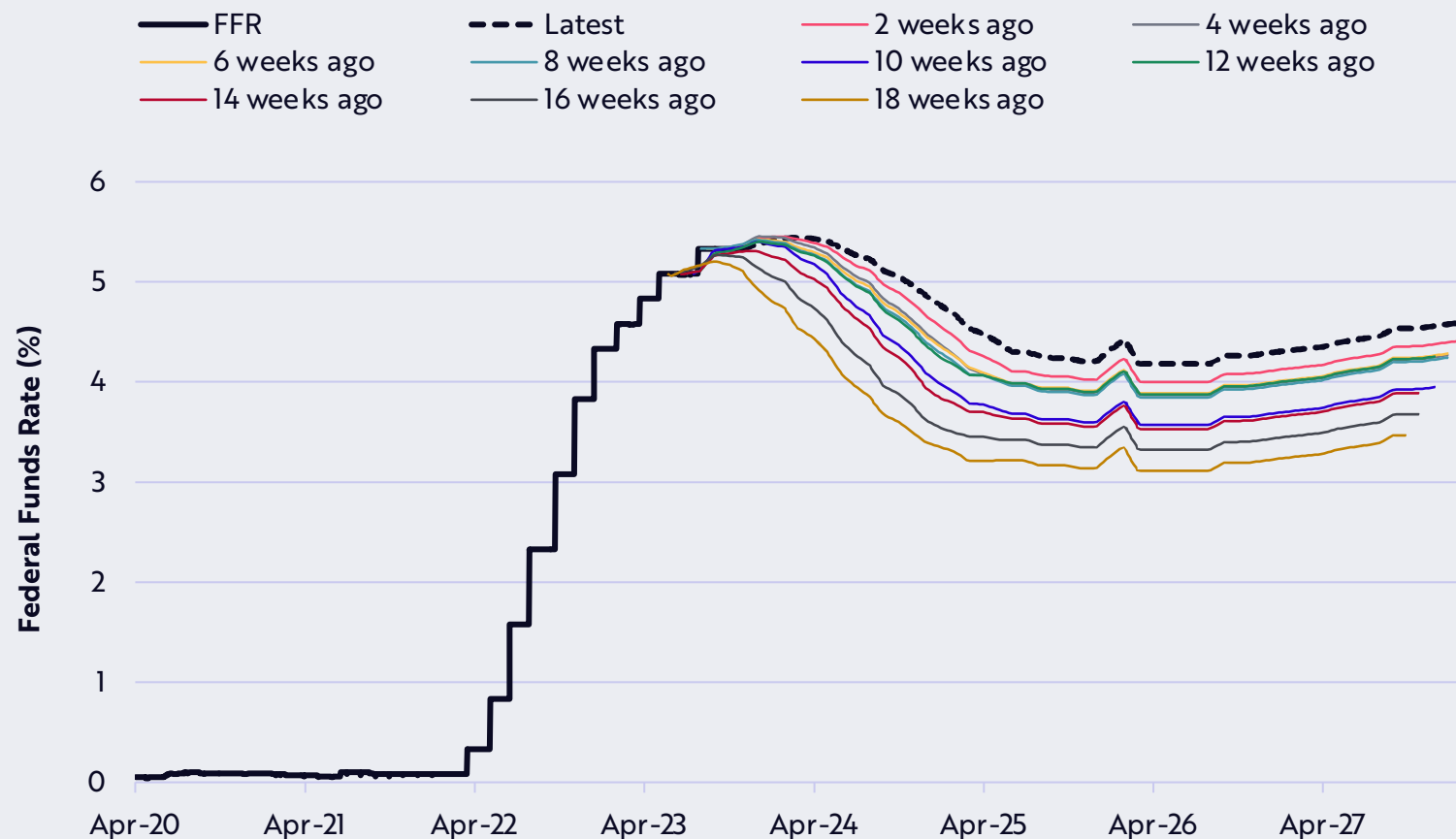
Higher Rates, Prices, And USD Pose Macroeconomic Challenges





Interest Rate Risks Continue To Rise

Federal Funds Rate Futures Pricing



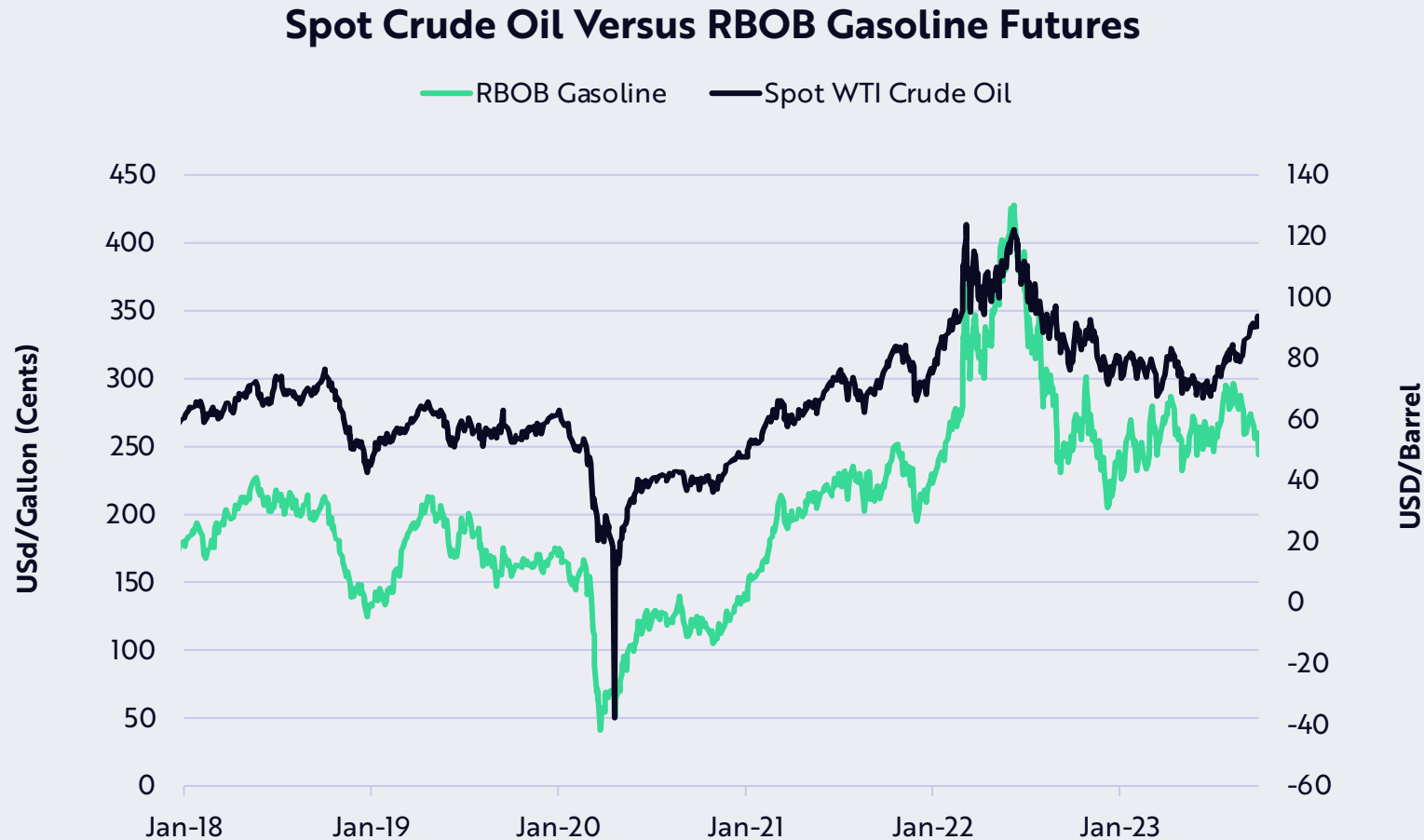
ARK'S VIEW: BEARISH

- Federal funds rate futures suggest that interest rates will be elevated for longer than the market previously expected.
- Rising interest rates could reduce market liquidity and increase the risk of defaults and counterparty risk.

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



Gasoline Futures Contradict Spot WTI Crude Oil Prices



ARK'S VIEW: BULLISH

- The gasoline futures price and the spot WTI crude oil price are diverging sharply, the former decreasing 7.4% and the latter increasing 28.5% over the past quarter.
- As futures inherently are forward looking, ARK expects WTI crude oil pricing to fall as well.
- Gas prices impact consumers' disposable income and can act as a form of monetary easing when prices are declining, or monetary tightening when prices rise. The US consumer looks poised to benefit from lower gas prices in the near term.

Source: ARK Investment Management LLC, 2023. Chart data from Macrobond. Information as of September 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. "RBOB gasoline" refers to Reformulated Blendstock for Oxygenate Blending (RBOB) gasoline, a fuel product made from refined crude oil. RBOB gasoline often goes by the names gasoline, petro gasoline, or petrol.



The Trade-Weighted Dollar Has increased 44% Since 2011

US Fed Trade Weighted Nominal Broad Dollar Index



ARK'S VIEW: NEUTRAL

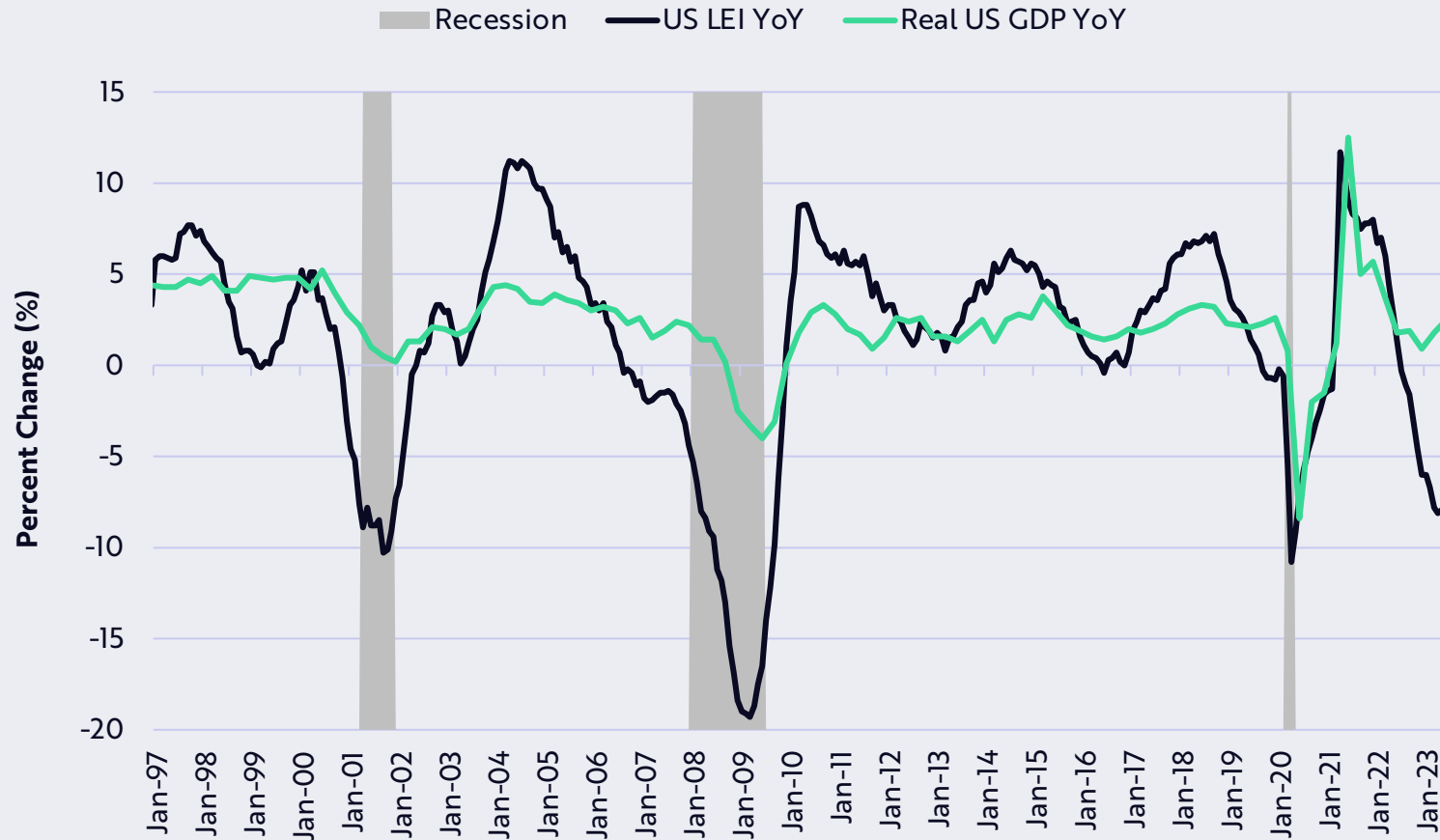
- The US Dollar (USD) acts as a safe haven currency during times of economic uncertainty—a barometer of risk.
- A stronger dollar tends to reduce the cost of imported goods and commodities, contributing to lower inflation rates in the US.
- The appreciation of the US dollar can strain global liquidity, particularly in emerging markets and economies with high dollar-denominated debt.
- Should a struggling Eurozone slide into recession, the USD could strengthen further.

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



The US Leading Economic Index (LEI) Continues To Signal Recession

Conference Board Leading Economic Index



ARK'S VIEW: BEARISH

- The LEI has contracted for 14 consecutive months since July 2022.
- The economic variables in the LEI lead changes in economic activity. They include the average workweek, jobless claims, Institute of Supply Management (ISM) new orders, and interest rate spreads.
- The index correlates with Gross Domestic Product (GDP) growth. The consensus forecast for real GDP growth is 2.1% year-over-year in 2023. The LEI suggests that the risks to growth are on the downside.

Source: ARK Investment Management LLC, 2023. Chart data from Conference Board and Macrobond. Information as of September 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.



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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ARK Investment Management LLC

This report is the result of a collaboration between ARK and Will Clemente of Reflexivity Research. Reflexivity is a research firm dedicated to the world of bitcoin and cryptocurrencies, and is unaffiliated with ARK.