

HASHDEX RESEARCH

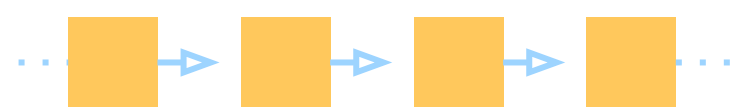
Bitcoin

The rise of exponential gold



Bitcoin permanently changed how value can be transferred.

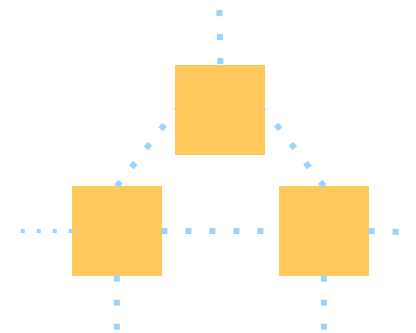
It is the first blockchain-based network, allowing value transfer without intermediaries. Launched in 2009, it makes use of decades of efforts to create a digital currency, and remains the most valuable digital asset network.¹ Bitcoin's foundation includes three pillars:



1

Transparent

Bitcoin's blockchain is a publicly available digital ledger — stored in tens of thousands of computers (nodes) — that maintains all confirmed transactions.



2

Decentralized

Bitcoin users around the world run nodes to transfer value over the internet, as well as validate and update information on the Bitcoin blockchain.



3

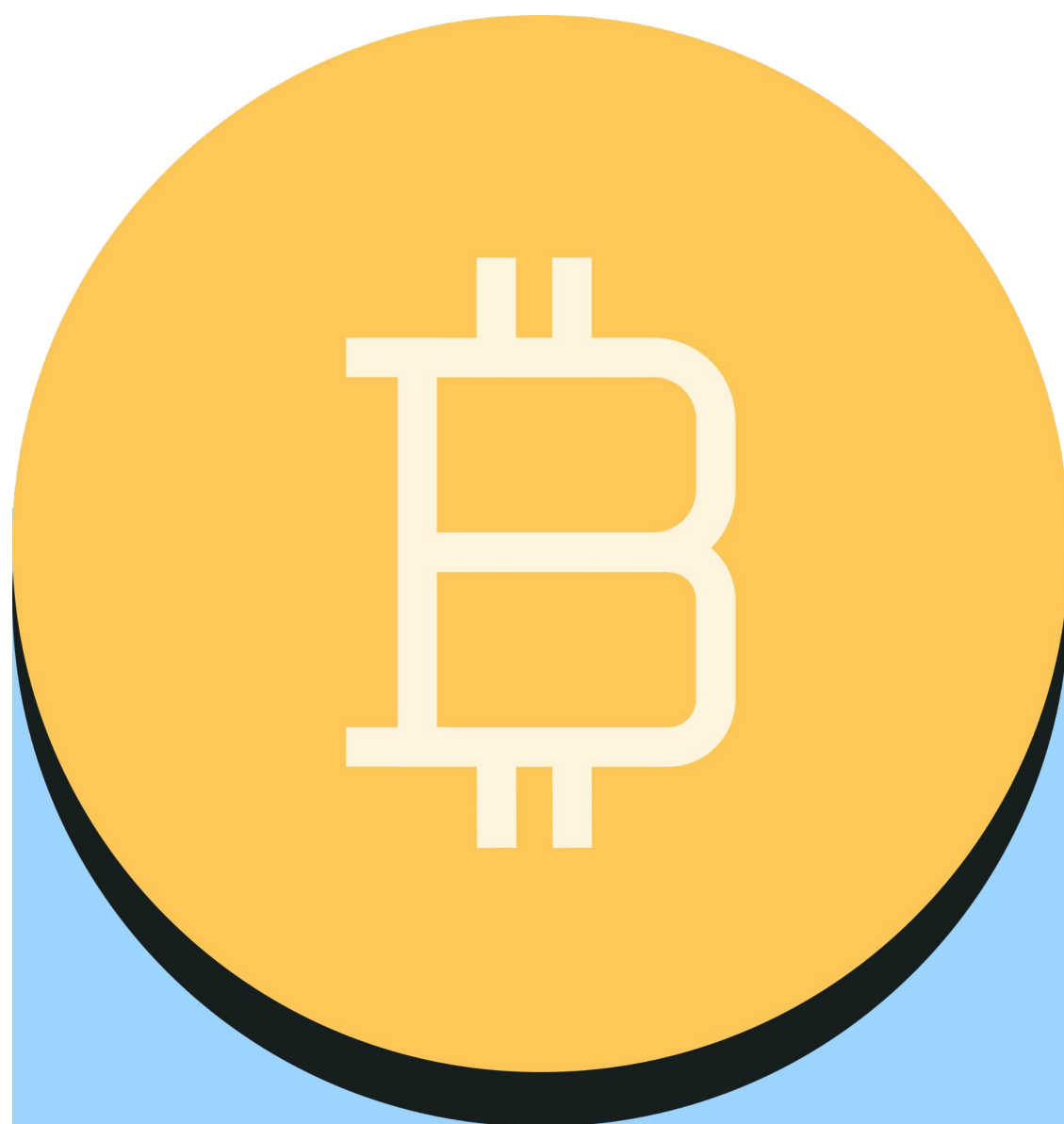
Immutable

Bitcoin's network requires a computational cost for users seeking to update its ledger, making it cost prohibitive to alter blockchain transactions.

¹ Source: CoinMarketCap (as of December 31, 2023).



The Bitcoin network's native asset is *bitcoin*¹ (BTC), providing:



A payment method and medium of exchange

- The Bitcoin network created a peer-to-peer value transfer system.
- Bitcoin user balances are denominated in bitcoin (BTC).
- Individual users exchange value using unspent balances to transfer BTC ownership from one user to another.



Incentives for security

- Bitcoin miners expend computational power to include transactions in new blocks of the blockchain.
- BTC is the reward paid to miners for their efforts.
- Successful miners receive newly issued BTC according to a predefined and immutable schedule.



Store of value attributes

- BTC's supply curve makes it a potential store of value.
- There is a cap for the total number of BTC and a disinflationary issuance curve that progressively reduces the number of newly issued BTC over time.
- BTC's supply is inelastic to demand, preserved by the protocol's difficulty adjustment.

¹ "Bitcoin" with uppercase "B" refers to the network, whereas "bitcoin" with lowercase "b" or "BTC" refers to the asset.

The supply of BTC is driven by three unique factors.

1. Scarcity

Supply is capped at 21 million BTC.

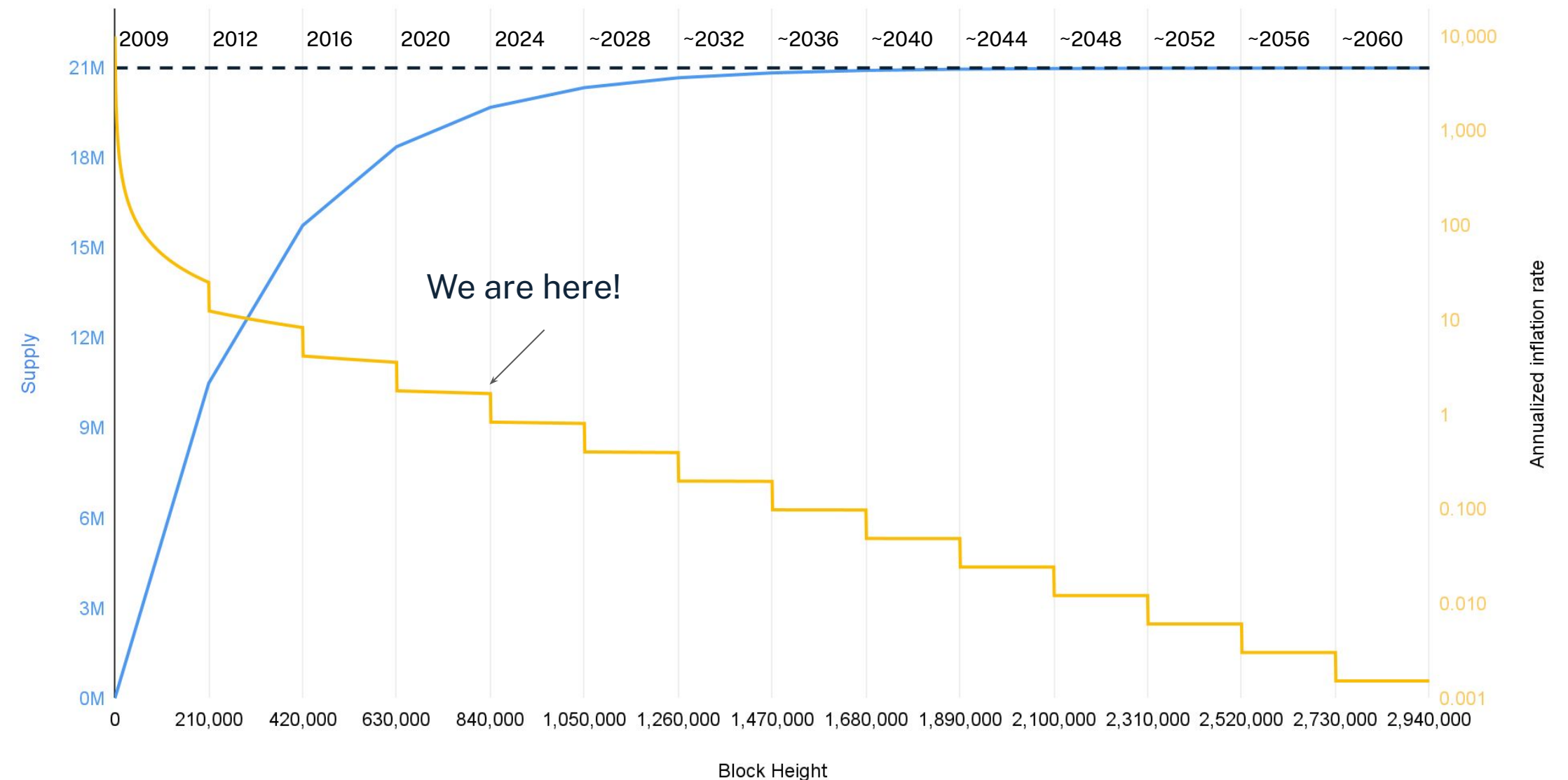
2. Disinflation

The rate of expansion of supply diminishes over time. This supply schedule includes “halvings,” which occur every four years and cut in half the number of newly issued BTC.

3. Rigid monetary policy

BTC’s issuance schedule is set in stone and has never changed since inception.

Bitcoin’s supply and annualized inflation rate¹



¹ Source: Hashdex Research according to the theoretical supply schedule of Bitcoin since inception, past halving years and projected future halving years assuming 10 minute average block times until 2064.

Demand for BTC is driven by two main use cases.



1

Digital store of value (SoV)

BTC has a monetary policy independent of any central authority, making its holders immune to monetary debasement. It is also more portable, more easily divisible, and easier to transact than gold, allowing users to store BTC without counterparty risk or huge costs.



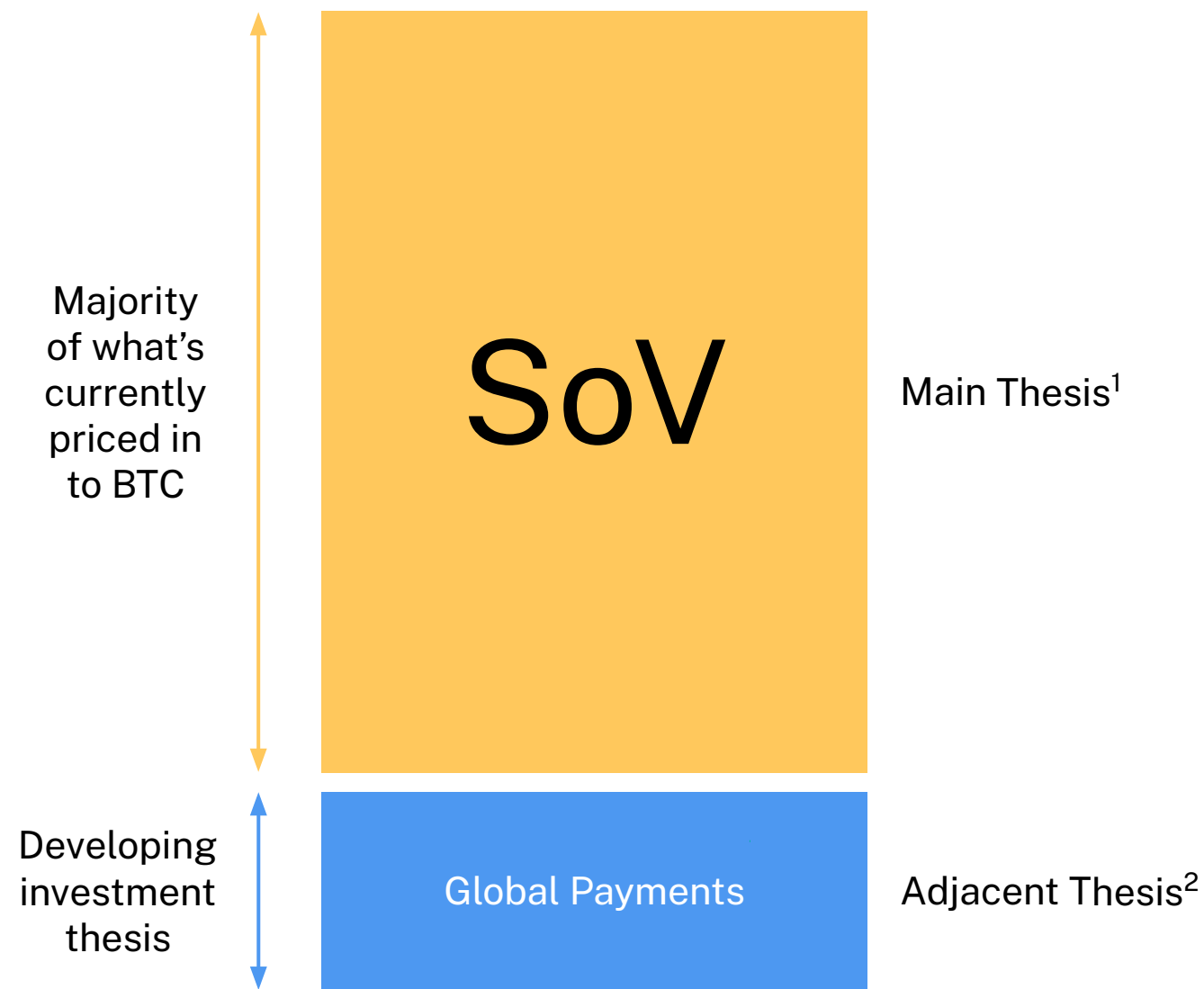
2

Global payments

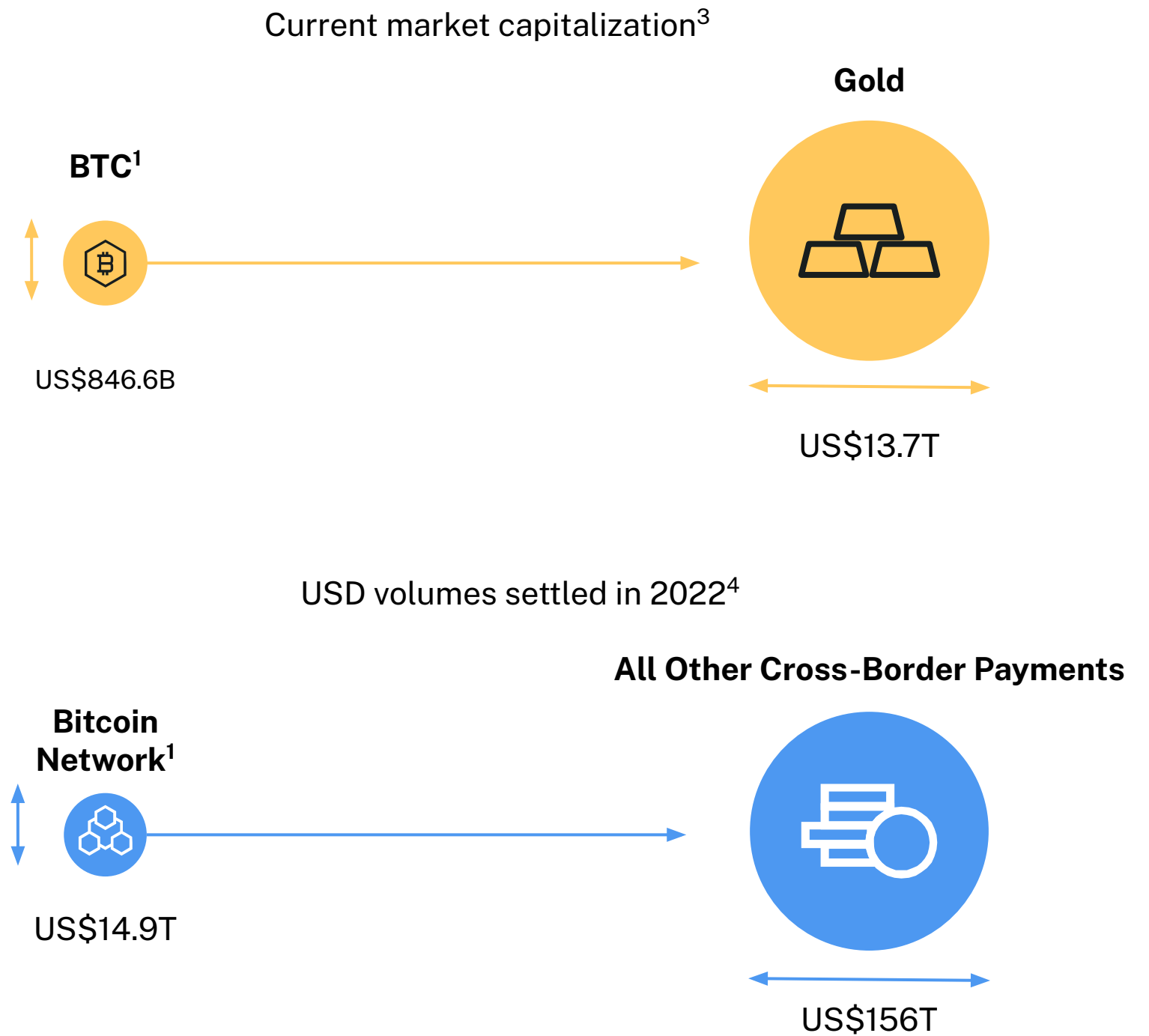
BTC can be transferred globally 24/7 without traditional gatekeepers. This reduces transaction costs, provides an alternative for millions of unbanked people worldwide, and streamlines remittances through a secure system accessible by anyone.



BTC adoption has tremendous growth potential.



Currently, we believe most of BTC's value comes from investors perceiving it as an **emerging digital store of value**.



1 Infocharts not necessarily to scale.

2 Optionalities not priced into the SoV thesis and under potential development.

3 Data from [Companies Market Cap](#) and [Coin Market Cap](#), accessed in January 16, 2024.




4 Data from [Ernst & Young](#) and [River Payments](#), accessed in January 16, 2024.





BTC improves on several attributes of fiat currencies and gold.

Bitcoin's properties make it fundamentally different from a fiat currency, which has an unlimited supply and generally increases over time. And BTC is more scarce, portable, and divisible than gold.

	Fungibility	Non-consumability	Portability	Durability	Divisibility	Security	Easy to transact	Scarcity	History	Censorship-resistant	Sovereignty	Programmable	Decentralized	Volatility
 BITCOIN	High	High	High	High	High	High	High	High	Low	High	Low	High	High	High
 GOLD	High	High	Low	High	Moderate	Moderate	Low	Moderate	High	Moderate	Low	Low	Low	Low
 FIAT	High	High	High	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	High	Low	Low	Moderate

Bitcoin has more efficient infrastructure for global payments.

BTC can be a gateway for investors to become users of the Bitcoin network, which has the essential features to gain market share in global payments. This adjacent thesis — Bitcoin as a global payments network — highlights its potential as a digital store of value.

	Native speed	Native cost	Accessibility
Bitcoin (via the Lightning Network technology)	Seconds	Low	Global 24/7, but limited adoption
Correspondent banking	Days	High	Global, besides sanctions
Fintech (e.g., Wise, Revolut)	Days	Medium	Unavailable in many countries
Money transfer operator (e.g., Remitly, Western Union)	Hours/Days	High	Global, business hours only
Card (Credit/Debit)	Seconds	Medium	Global 24/7



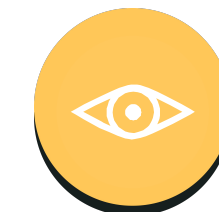
Faster



Cheaper



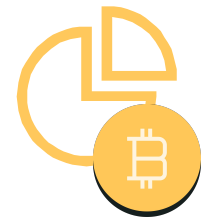
More Incorruptible



More Auditable

Both of BTC's investment theses are gaining momentum.

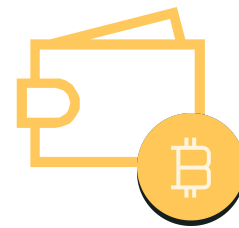
% of supply held for
the long term



70%

70% of the BTC supply has currently been held for over a year, illustrating investor interest in the asset as a long-term holding.

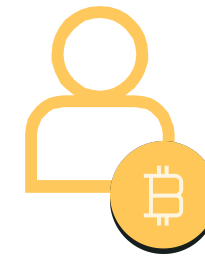
Number of wallets
holding bitcoin



52 million

More than 50 million digital wallets worldwide hold some BTC balance.

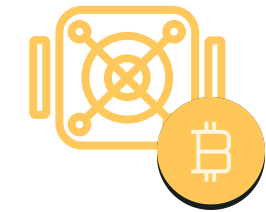
Daily active
users



783,000

The Bitcoin network surpassed 750,000 daily active users at the end of 2023.

Computational
power

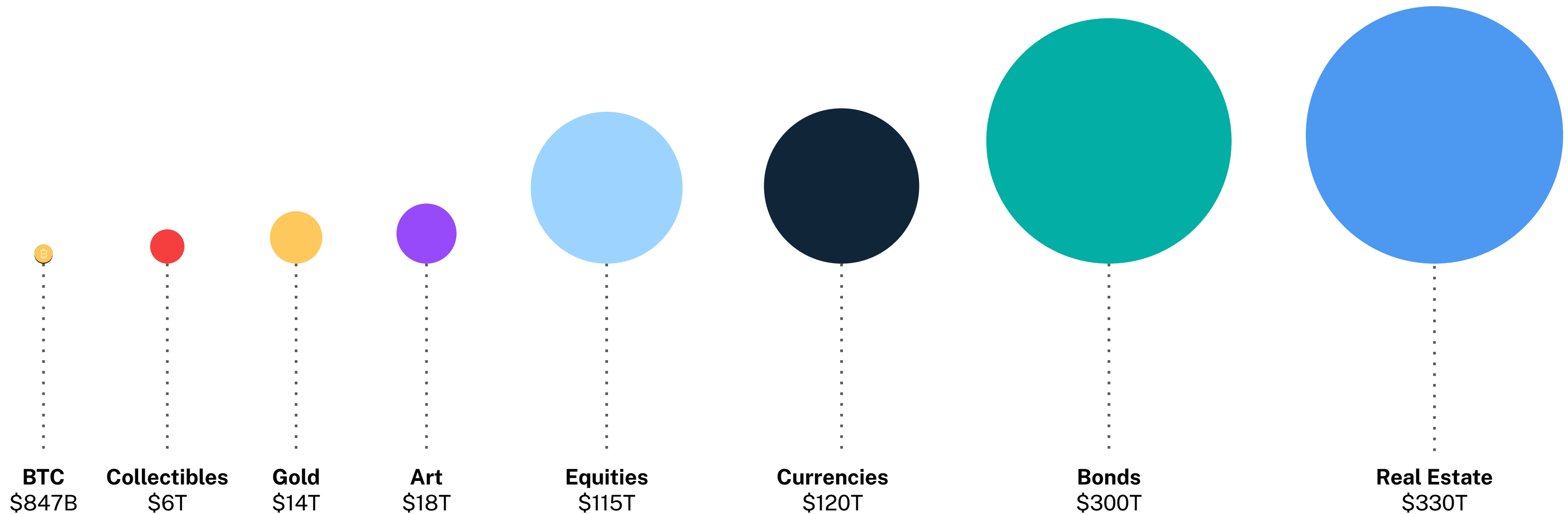


600 EH/s

Bitcoin's computational power is equivalent to 60 trillion high-end retail computer CPUs trying to mine the next Bitcoin block.



Despite extraordinary growth, BTC's relative market value is tiny.¹



¹ Source: Jesse Myers - Bitcoin's Full Potential Valuation and CoinMarketCap.com. Areas of circles proportional to the total asset value.



BTC has been the best performing asset in the past 10 years.

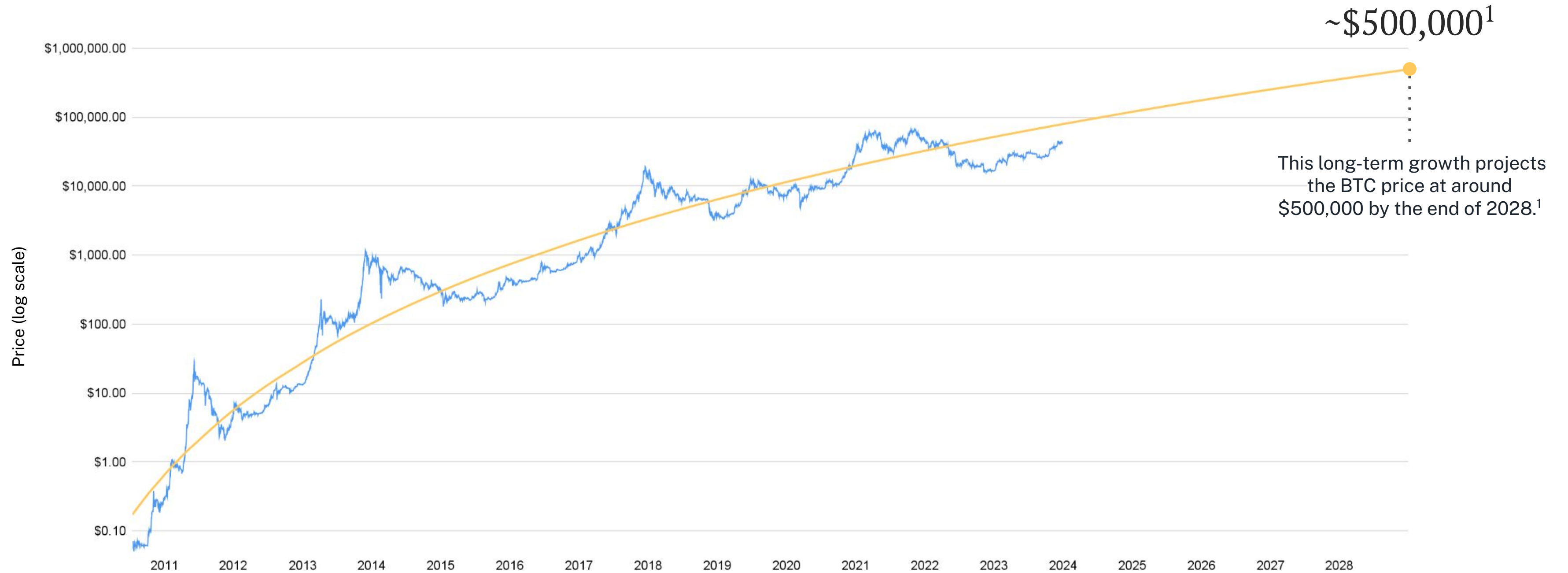
										2014-2023	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Period	Annualized
TLT 23.6%	Bitcoin 34.9%	Bitcoin 125.2%	Bitcoin 1,332.2%	Russell 2000 11.9%	Bitcoin 92.5%	Bitcoin 303.8%	Bitcoin 59.6%	DXY 8.2%	Bitcoin 155.7%	Bitcoin 5,619.3%	Bitcoin 49.9%
Nasdaq 100 17.9%	DXY 9.3%	Russell 2000 18.4%	EM 37.3%	DXY 4.0%	Nasdaq 100 38.0%	Nasdaq 100 47.6%	S&P 500 26.9%	Gold -0.4%	Nasdaq 100 53.8%	Nasdaq 100 368.5%	Nasdaq 100 16.7%
DXY 12.6%	Nasdaq 100 8.4%	EM 11.2%	Nasdaq 100 31.5%	Nasdaq 100 -1.0%	S&P 500 28.9%	Gold 25.1%	Nasdaq 100 26.6%	AGG -15.0%	S&P 500 24.2%	S&P 500 158.1%	S&P 500 9.9%
S&P 500 11.4%	S&P 500 -0.7%	S&P 500 9.5%	S&P 500 19.4%	Gold -1.6%	Russell 2000 23.5%	Russell 2000 18.4%	Russell 2000 13.5%	S&P 500 -19.4%	Russell 2000 16.1%	Russell 2000 121.1%	Russell 2000 8.3%
Russell 2000 3.5%	AGG -1.9%	Gold 8.4%	Gold 13.2%	AGG -2.6%	EM 18.4%	EM 18.3%	DXY 6.4%	EM -20.1%	Gold 13.2%	Gold 71.2%	Gold 5.5%
AGG 3.5%	TLT -4.2%	Nasdaq 100 5.9%	Russell 2000 13.2%	TLT -4.2%	Gold 18.3%	TLT 16.4%	EM -2.5%	Russell 2000 -22.2%	EM 9.8%	EM 30.0%	EM 2.7%
Gold -1.8%	Russell 2000 -4.9%	DXY 3.6%	TLT 6.5%	S&P 500 -6.2%	TLT 11.5%	S&P 500 16.3%	AGG -3.5%	TLT -32.8%	AGG 2.3%	DXY 26.4%	DXY 2.4%
EM -2.2%	Gold -10.4%	AGG 0.1%	AGG 1.2%	EM -14.6%	AGG 5.5%	AGG 5.2%	Gold -3.6%	Nasdaq 100 -33.0%	TLT -0.7%	TLT -2.9%	TLT -0.3%
Bitcoin -56.8%	EM -14.9%	TLT -1.2%	DXY -9.7%	Bitcoin -73.2%	DXY 0.5%	DXY -6.8%	TLT -6.1%	Bitcoin -64.2%	DXY -2.0%	AGG -6.7%	AGG -0.7%

Source: Performances of TLT, gold, DXY and the Nasdaq 100 retrieved from TradingView. Performance for the S&P 500 from [the index official fact sheet](#), BTC performance from the [Bitcoin Liquid Index](#) by Brave New Coin. Emerging Markets (EM) represented by the [MSCI Emerging Markets Index](#). AGG standards for the [iShares Core U.S. Aggregate Bond ETE](#). All data as of December 31, 2023. Past performance is not a guarantee of future results.





There is significant upside potential in the coming years.¹



¹ We describe the long term growth of the bitcoin price by a logarithmic regression line, which models exponential growth including diminishing returns. Trend line is derived from a logarithmic regression trend fitted to bitcoin's market capitalization and a modeling of the future bitcoin supply based on its issuance schedule (assuming an average block time of 10 minutes). Model uses Glassnode data from July 17, 2010 to December 31, 2022. Everything since the beginning of 2023 is a prediction. Actual bitcoin prices retrieved from Messari from July 21, 2010 to December 31, 2023. **Past performance is not a guarantee of future results.**



BTC will become increasingly important to diverse portfolios.

1

Constrained supply

The supply of BTC is driven by three unique factors — its scarcity, disinflation characteristics, and a rigid monetary policy.

2

Increasing demand

The strongest current use case for BTC is as a store of value, but its adjacent use as a global payments network will likely increase over time.

3

It's still early

BTC is the best performing asset over 10 years. However, it has a tiny relative market value and its maturation as an asset is creating an exponential growth trajectory.



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