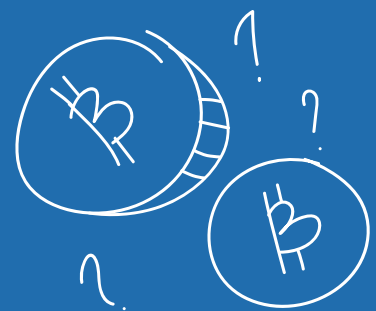


White paper – January 2022

The future of Bitcoin

Dr. Misha Malyshev,
CEO and CIO, Teza Technologies



Introduction

For many, an investment in cryptocurrencies has become synonymous with investment in Bitcoin. The idea of investment in Bitcoin (BTC), while initially unnerving for the general public, has now entered the basic rhetoric of financial pundits and investment gurus. Bitcoin has even started to appear on Markowitz's diagrams alongside stocks and bonds. The only question seems to be: what is the optimal allocation percentage?

Bitcoin seems like a logical entrypoint to crypto investing. Bitcoin is the original cryptocurrency with:

- About \$1T market cap
- Stellar (though volatile) historical performance
- Fully decentralized blockchain with the longest (13 years) track record of all cryptocurrencies
- A network that has never been compromised
- First mover advantage and the largest capitalization among other crypto tokens

However, an investment in Bitcoin is not the same as an investment in a broader digital asset class. While investment in a broader digital asset class - the emerging world of web3 - presents an attractive opportunity, we caution long-term investors against making an allocation to Bitcoin specifically.

The rest of this paper addresses forces of supply and demand for Bitcoin that would allow one to make projections on Bitcoin price evolution.

Stock-to-Flow Model

The most celebrated pricing model used to predict Bitcoin is the stock-to-flow model. According to the model, BTC prices are subject to infinite growth.

The first failure of the model occurred in November/December 2021:

- Predicted price for November - \$98k, December - \$135k.
- **Actual** price for both months - below \$50k.

Why did the internet's most popular pricing model fail even though it relied on the only true law of price formation - supply/demand imbalance? The S2F model makes two assumptions about bitcoin that are both necessary, but wrong.

Long-term supply: Is Bitcoin really an irreplaceable asset with limited supply?

Every single argument about Bitcoin price appreciating in perpetuity starts with a statement on the *hard limit* of supply of Bitcoin. With a theoretical maximum of 21 million coins, and 18.9 million mined already, that seems like a strong point.

The limited supply argument, however, doesn't make sense if Bitcoin is easily replaceable. Let's consider the following example to illustrate our point. If the U.S. Treasury decided to stop printing \$20 bills for good, their supply would immediately become limited. But for as long as people can use \$5, \$10, \$50, and \$100 bills, it is not such a big deal. The price for the remaining \$20 notes would not skyrocket beyond their nominal value.

While BTC itself has limited supply, its open-source code allows for easy replication by any other distributed ledger system with its own limited supply. Originally built as 'jokes,' both DOGE and Shiba Inu coins could possibly replace Bitcoin as they are within 10 coins from BTC on the capitalization ladder.

Historical evidence suggests that it is very easy to launch a cryptocurrency that resembles Bitcoin both in underlying technical and monetary structure. These coins will continue to find a comfortable place in this speculative and volatile market, attracting investors who have missed the opportunity to generate 'crazy' returns on early crypto investments.

With the limited supply argument threatened, Bitcoin fans and large holders argue that BTC is somehow special. Without any technical superiority (in fact, DOGE is technically stronger), there is only belief that bitcoin is "it." Investors who hold this belief like to compare Bitcoin to gold and by association "prove" that since gold has held its value among all other assets, the original digital gold - Bitcoin - will too. That comparison however, is faulty for the same reason: gold as a store of value cannot be replaced by silver or platinum since they do not have the same physical properties as gold. Bitcoin, however, is different from exact copies only by name, by slightly longer digital ledger and by existing distribution among holders.

Actually, the existing distribution presents a problem for belief in Bitcoin as "digital gold." Bitcoin ownership is highly concentrated. Ownership of gold, on the contrary, is distributed among nations, geographies, and income levels. Such high concentration makes belief in bitcoin highly unstable. If a majority of participants' votes is required to call a cryptocurrency "the one," then wouldn't they rather vote for something new, in which they have a chance to own a "fair share" of it? As opposed to continuing to support a coin that makes only 1% of 1% of its holders "super rich"? Any time the majority has a chance at a better deal, they are likely to opt for that. A more evenly distributed coin will have a much better chance to be the consensus choice for "digital gold."

And since we have already heard calls to move away from Bitcoin by none other than the biggest crypto influencer of all - Elon Musk it's just a matter of time until belief in Bitcoin dwindles.

Long-term Demand: defining Bitcoin value

The second assumption used the S2F model and shared among BTC holders that there will be a constant demand for Bitcoin. But the prerequisite for continuous demand is that there is innate, fundamental value in Bitcoin. Moreover, that value must be greater than the cost of supporting it (Bitcoin is an asset that requires continuous input of energy to maintain its existence).

Traditionally, the value of an asset has been defined by the range of its possible applications. Commodities like fuel have maintained a high market value for over a century because of their widespread use and overall impact on human life. A share of a company, for example, is not only an investment tool. It represents a piece of its assets or share of its intellectual property. Bitcoin is an open-source system with no IP rights, which means that only its utility to consumers can determine its value.

The initial promise was that Bitcoin would become the transaction currency of the world. However, Bitcoin failed to become a new convenient payment system for several reasons:

- The cost (in Terawatt-hours) is too high (currently the payors don't see it as confirmations are paid by newly minted coins, but once minting is over, the fees will skyrocket).
- The confirmations are too slow to be adopted for every day transactions.
- The price is too volatile for any non time of sale deals.

Other cryptocurrencies like Tether (USDT) and its equivalents are much better suited for digital transactions because, unlike Bitcoin, they are tied back to the U.S Dollar.

The only value of Bitcoin, again, seems to be the "value in faith," a shaky, current human belief that this particular asset is needed.

Bitcoin price in the long and short term

For Bitcoin to appreciate indefinitely, it must be both limited in supply and have continuous demand. If one of these conditions fails, Bitcoin's price should gravitate to zero over time. We believe that both of the necessary conditions fail. And that brings BTC's long-term equilibrium price to **zero**.

Bitcoin is a cult, a religion that at its current point looks invincible. But the history of the world teaches us that no "indestructible" structures live forever. The Dutch East India Company was the most valuable company globally for over 200 years and outlived entire countries only to eventually die out.

Bitcoin can be considered to remain a 'dominant' market presence so long as its market capitalization is at least 10% of the sum of all crypto coins. Based on current market trends, the process of Bitcoin's share decline can be estimated at ~5-7 years. It is not likely to be linear, however, and probably be done in 2-4 years, as such effects tend to have positive feedback loops (accelerate).

While Bitcoin price is likely to go up even during market share decline due to increasing institutional adoption, it will trail the development of the broader web3 market. Once new, truly functional cryptocurrencies begin to dominate the market, Bitcoin, with its expensive support system, will simply drop to zero as transaction confirmations will eventually cost more than the asset itself.

In the short term, BTC value will be governed by the following market forces:

- Institutional adoption of Web3.
- Share of Bitcoin in the cryptocurrency market.
- Climate impact and cost of BTC blockchain support.

Institutional Interest in Bitcoin

The two most important short-term factors that determine Bitcoin's market price are institutional interest in the cryptocurrency and the government regulations around it. While individual investors were the first to discover and use Bitcoin (e.g. the urban legend of a man buying two pizzas at a Florida-based Papa John's for 10,000BTC back in 2010), it is only recently that large financial institutions have started to show tangible interest in the asset.

- Institutional investors currently own about \$70B in Bitcoins (about 8% of all coins).
- ~\$47B invested by hedge funds, ETFs, and pension funds.
- ~\$12B held by 34 public companies, including Microstrategy and Tesla.
- ~\$8B in private companies, \$6.8B in EOS (Block One).
- ~\$3B held by governments of several countries (El Salvador, Bulgaria, and Ukraine).

Some of the largest investment banks in the world now offer crypto products to clients. Select Morgan Stanley clients are now provided access to Galaxy Digital, one of the biggest Bitcoin funds on the market¹.

Following Bitcoin's legal victories in several countries across North America and Europe, financial advisors now advise their risk-tolerant clients to invest 5-10% of their assets in cryptocurrency, primarily Bitcoin.

¹ <https://www.cnbc.com/2021/03/17/bitcoin-morgan-stanley-is-the-first-big-us-bank-to-offer-wealthy-clients-access-to-bitcoin-funds.html>

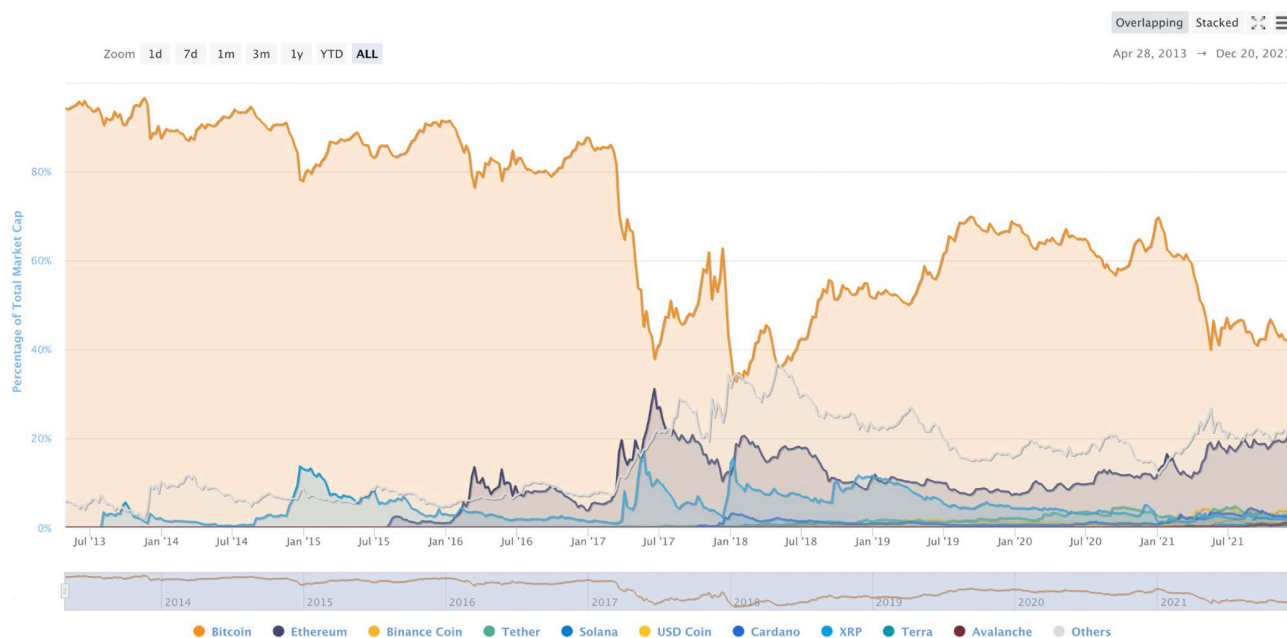
The only large market where Bitcoin has met unilateral hostility is China. The Chinese government has currently banned all mining and trading of Bitcoin in the country and will likely impose a complete ownership ban in the coming months. This is expected to have a strong effect on Bitcoin's price.

Declining market share of Bitcoin in web3 market

While institutional adoption has helped Bitcoin achieve widespread acceptance and a higher perceived value, the percentage of Bitcoin's market capitalization in relation to the rest of the market has steadily declined. Other, more functional crypto tokens entered the marketplace. "Original" cryptocurrencies' general lack of potential for everyday application puts them at a risk of losing ground against web3 products.

Bitcoin will continue to lose market share due creation of more advanced decentralized projects and the rise of competitive bitcoin clones. The process has in fact already begun, with Bitcoin already down to less than 40% of digital market share, a space it once single-handedly dominated.

The focus in crypto now is on how these decentralized products are going to impact our lives. The time for proof of concept coins is over.



Down to ~40% of total digital market cap

Sustainability and Climate Concerns Around Bitcoin

The one resource that Bitcoin blockchains utilize more than any other is energy. Mining activities are currently very profitable, with more miners and computers being added to the game. But Bitcoin's 'proof of work' mining algorithm becomes increasingly complex as the number of miners increases.

Bitcoin currently uses over 200 terawatt-hours of electricity annually, more than all but 22 countries with a population of millions². Confronted by that fact, any institutional board with a robust ESG policy would favor other coins for their digital asset allocation.

² <https://digiconomist.net/bitcoin-energy-consumption/>

Bitcoin was originally built as a pioneering blockchain concept that simply functioned as a trial, paying no heed to computing speed or efficiency. This leaves a huge gap and, in turn, a promising opportunity in the market for a newer, more efficient cryptocurrency that can reduce operational redundancies and energy use.

Conclusion

Web3 has great appeal for investors' portfolios. We do not know, however, which projects will survive the test of time. However, Bitcoin, the cryptocurrency that started it all, is unlikely to be among the survivors. With no protectable uniqueness, no functional value, and a very expensive life support system, it's likely to simply become a museum exhibit.

Instead, investors may consider a broad basket of crypto tokens (100+) to get exposure to explosive growth of web3. Alternatively, lower risk solutions such as long/short market neutral portfolios may be appropriate.

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