

THREE BITCOIN VALUATION METHODS – A LITERATURE REVIEW

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“Bitcoin is dead” as pronounced 411 times by mainstream media.ⁱⁱ Why the disdain and disbelief? Perhaps it originates from bitcoin’s famously hidden message on its genesis block, “chancellor on brink of second bailout for banks”, when bitcoin was born as a decentralized peer-to-peer electronic cash systemⁱⁱⁱ in Jan 2009 during the global financial crisis.^{iv} Gradually, “what doesn’t kill you, only makes you stronger”. While central banks were busy printing fiat currencies out of thin air, bitcoin started its super bullish cycle since Oct 2020 with price quintuple in less than five months. In retrospect, “it is inevitable”, as claimed by Elon Musk whose Tesla treasury buying up to 10% bitcoin with corporate cash^v, coinciding with mass institutional adoptions including PayPal^{vi}, Square^{vii}, Guggenheim^{viii}, MassMutual^{ix}, NY Bank of Mellon^x, Fidelity^{xi}, JP Morgan Chase^{xii}, DBS

Bank^{xiii}, BlackRock^{xiv} etc. This article leads investors through the three bitcoin valuation methods utilized by “smart money”.

“The bitcoin story is very easy; it is supply and demand. Bitcoin is digital gold, and it is better at being gold than gold.”^{xv} Bitcoin is a scarce digital asset that cannot be devalued like fiat currency, with a fixed supply of 21 million; ownership is preserved on a public, transparent, and decentralized ledger, as maintained by global network, advanced cryptography and market incentives.

The store of value theory states that a digital asset’s value is a function of its ability to act as a store of monetary value for its investors and users. As an example of calculating the fair value of the price of bitcoin with store of value

Rank	Name	Symbol	Market Cap	Price	24h	7d	Price (30 days)
1	Gold	GOLD	\$11.637 T	\$1,832	0.90%	3.57%	
2	Apple	AAPL	\$2.173 T	\$130.21	0.53%	-0.95%	
3	Microsoft	MSFT	\$1.901 T	\$252.46	1.09%	0.11%	
4	Saudi Aramco	2222.SR	\$1.901 T	\$9.51	0.00%	0.71%	
5	Amazon	AMZN	\$1.66 T	\$3,291	-0.45%	-5.07%	
6	Alphabet (Google)	GOOG	\$1.592 T	\$2,398	0.73%	-0.47%	
7	Silver	SILVER	\$1.507 T	\$27.57	0.32%	6.06%	
8	Bitcoin	BTC	\$1.071 T	\$57,257	-3.04%	0.65%	
9	Facebook	FB	\$904.73 B	\$319.08	-0.29%	-1.85%	
10	Tencent	TCEHY	\$752.08 B	\$78.18	-0.23%	-1.86%	
11	Berkshire Hathaway	BRK-A	\$664.98 B	\$437,131	0.46%	5.97%	
12	Tesla	TSLA	\$647.43 B	\$672.08	1.29%	-5.27%	

(Figure 1: image courtesy of 8marketcap.com)

in mind, we could look at the price of gold and make the assumption that bitcoin could one day replace gold as the go-to store of value for investors.^{xvi}

At a current gold price of around \$1,832 per troy ounce, the total value of the world's gold bullion is around \$11.6 trillion. Suppose bitcoin replaces gold as a popular store of value globally and its total network value rise to \$11.6 trillion, knowing that the total supply of coins is capped at 21 million, the price of one BTC would end up being \$552,380.

$\$11.6 \text{ trillion} / 21 \text{ million BTC} = \$552,380$ per one bitcoin (Figure 1)

Bitcoin's Price Dynamic: Stock to Flow Model

"As a thought experiment, imagine there was a base metal as scarce as gold, and one special, magical property: can be transported over a communications channel" - Satoshi Nakamoto^{xvii}. Bitcoin is the first digital object with a fixed supply that cannot be copied, duplicated or forged, contributing to its unique mathematical value. The Bitcoin network has been generating uninterrupted blocks since day 1 - genesis block was generated on the 3rd, Jan, 2009 and the reward for mining it was 50 bitcoins. On every 210,000 generated blocks

there is an event called "halving" which cuts, in half, the reward value distributed to miners from that moment on. Since blocks are generated every 10 minutes, "halving events" take place every 35,000 hours: almost exactly every 4 years. Halving events continue to take place until the reward for miners reaches 0, as after the 33rd halving in year 2140. It will be the 21 millionths bitcoin to come into existence, after which point it will be impossible to create anymore, and after that bitcoin will become truly deflationary^{xviii}. An anonymous hedge-fund manager in the name of "Plan B"^{xix} applied Stock-to-Flow model to bitcoin price on a log scale, with an astonishing accuracy: (Figure 2)

The 'Stock-to-flow' is a number that shows how many years, at the current production rate, are required to achieve the current stock.

S2F ratio = Stock / Flow

While Stock = current reserve

Flow = current production

Bitcoin with a fixed supply on an immutable irreversible blockchain is associated with scarcity, the word linked with precious metal and monetary supply. Note for bitcoin as it halves every four years, the flow would decrease to 50% of its last value every four



(Figure 2: image courtesy of lookintobitcoin.com)

years, causing its S2F to double every four years, making it more scarce in nature. The above figure is done with linear regression plotted on a log scale chart illuminating the mathematical relationship between past (dotted) and predicted (line) bitcoin price as a function of its S2F ratio, which increases every four year in the halving events due to the halving decrease in the production. For more in-depth analysis, readers are encouraged to pursue this article “modelling bitcoin with scarcity”^{xx} written by Plan B.

Bitcoin as World Reserve Currency

“Upon when investors use bitcoin denomination, not US dollar denomination on the accounting balance sheet, Bitcoin become a reserve currency in the monetary system.” – Nik Bhatia, “Layers money: from gold and dollars to bitcoin and central bank digital currencies”^{xxi}. Quoting from this fascinating book, “Bitcoin is antifragile, because it thrives off global monetary disorder within the dollar pyramid and is resilient to the threats, slander, and legislation from dismissive bureaucratic entities. The plain truth about bitcoin is that nobody controls it. It has become the first-ever government-free, universally accessible digital currency ... The following figure elucidates a future in which BTC is the world reserve and only first-layer money:” (Figure 3)

In this version of future vision, all future money will eventually be digital tokens held in digital wallets. People will simultaneously hold an

assortment of currencies: bitcoin for neutrality with no counter-party risk, central-bank-digital currency for daily consumption and paying taxes, and stablecoins for earning interest. If bitcoin as a reserve currency embodies a future world outstanding treasury bond which is estimated as 119 trillion^{xxii}, per bitcoin price will eventually come to:

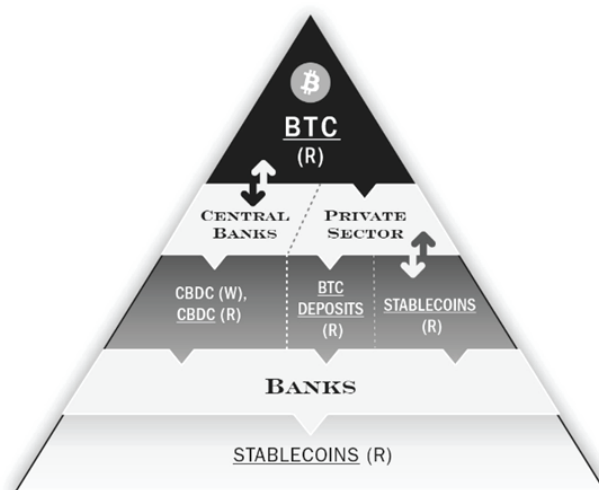
$\$119 \text{ trillion} / 21 \text{ million BTC} = \$5,666,666$ per one bitcoin

Conclusion

In conclusion, the above three mathematical modeling predicts bitcoin price statically and dynamically as follows:

1. If Bitcoin could eventually replace gold, 1 BTC would reach 550,000 USD.
2. If Bitcoin could eventually become world reserve currency, 1 BTC would be worth more than 5 million USD.
3. Dynamically speaking, stock to flow model has accurately simulated bitcoin to reach 10,000 USD in 2017 and to exceed 50,000 USD around 2021, both occurring within one year of halving event. It predicted bitcoin to reach or exceed 1 million USD around 2026.

This is only a mathematical modeling-based prediction, and by no means should be regarded as financial advice. ■



(Figure 3: image courtesy of layered money book)

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