RESEARCH ASSISTANT - CRYPTO

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Finance Section

1. Write a 500-word explanation of the Bitcoin stock-to-flow model and make an argument for why it is a bad model?

Bitcoin Stock to Flow model and its critique

The Bitcoin stock-to-flow (S2F) model introduced in March 2019 by a Bitcoin researcher and investor under the pseudonym of PlanB, shows a statistically significant relationship between Bitcoin's scarcity (as measured by its stock to flow ratio) and its market value. The Stock to Flow ratio is the amount of a resource held in reserves divided by the amount it is produced annually. According to Jamie Redman[1], it shows how many years, at the current production rate, are required to achieve the current stock.

S2F treats Bitcoin as being comparable to commodities such as gold, silver or platinum. These are known as 'store of value' commodities because they retain value over long time frames due to their relative scarcity. Let's take the example of gold. While the estimates may vary, the World Gold Council estimates that around 190,000 tons of gold have ever been mined. This amount (i.e., the total supply) is what we can refer to as the stock. Meanwhile, there are about 2,500-3,200 tons of gold mined each year. This amount is what we can refer to as the flow. We can calculate the Stock to Flow ratio using these two metrics. But what does it actually mean? It essentially shows how much supply enters the market each year for a given resource relative to the total supply. Hence, assets with high Stock to Flow ratio should, in theory, retain their value over the long-term [3].

Bitcoin is a similar resource. It's scarce, relatively costly to produce, and its maximum supply is capped at 21 million coins. Also, Bitcoin's supply issuance is defined on the protocol level, which makes the flow completely predictable. According to the model's projections, Bitcoin's price should see a significant increase over time due to it's continually reduced Stock to Flow ratio. There are several deficiencies in the model, both in its theoretical proposition and its empirical foundation.

From a theoretical standpoint, the model is based on the rather strong assertion that the USD market capitalization of a monetary good (e.g. gold and silver) is derived directly from their rate of new supply. No evidence or research is provided to support this idea, other than the singular data points selected to chart gold and silver market capitalization against bitcoin's trajectory. This becomes quite obvious when one extends the model into the near future. By 2045, the model estimates each bitcoin will be worth $235,000,000,000.

Another deficiency in the model is the naive application of a linear regression that results in a high probability of a researcher finding spurious results [2]. "Good" statistical results, such as a high R-square, do not constitute a meaningful finding. Sometimes, researchers underestimate how often such techniques lead to false results especially in situations like this where there is a large degree of freedom for random data to fit a specific outcome.

Subsequently, without further observational investigation, the stock-to-flow model should leave any expected financial specialist with a serious extent of incredulity.

References

[1] https://news.bitcoin.com/s2f-bitcoin-price-100000-usd/ - Jamie Redman, 2020.

[2] https://www.coindesk.com/why-the-stock-to-flow-bitcoin-valuation-model-is-wrong -Nico Cordeiro, 2020.

[3]https://cointelegraph.com/news/it-s-about-to-get-very-interesting-says-bitcoin-stock-to-flow-model-creator - Benjamin Pirus, 2019.