1.Finance:

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

The Stock to Flow concept estimates the relative availability of a valuable commodity. It measures the amount of a particular resource produced annually relative to the total available amount available across the world. Thus, it is calculated as the ratio of ***Stock*** (size of existing stockpiles or reserves) to ***Flow*** (the yearly production). Usually, this model is applied to natural resources like gold and silver and it provides an idea of how scarce a particular resource is. It depicts how much of a particular resource is introduced into the market yearly relative to the total supply. Therefore, the higher the stock to flow ratio, the less new supply enters a market relative to the total supply.

Considering that Bitcoin shares similar characteristics of scarcity and relatively high production costs with these highly valuable natural resources, the stock to flow model has been applied by some schools of thought to estimate its long term value. With the current circulating supply of about 18.5 million bitcoins and a new supply of 0.33 million bitcoin per year, since the last halving in May 2020, the Bitcoin SF ratio stands at about 56. The stock value model has been used to project future changes in the market value of Bitcoin. Plan B, a major SF model proponent, believes that the same logic, that gold is valuable both because new supply (mined gold) is insignificant to the current supply and because it is impossible to replicate the vast stores of gold around the globe, applies to Bitcoin, which becomes more valuable as new supply is reduced every four years.

The Stock to Flow model is hugely predicated on an assumption that there is a statistical relationship between the SF ratio (scarcity) and value. Plan B hypothesizes that scarcity directly drives value and backs up this hypothesis with the gold and silver examples. However, there has been no concrete evidence or research to support this notion. The assumption is also solely based on the fact that the scarcity Gold has continuously ensured its high value. This is however false as other factors such as volatility play a major role in determining market value. It is also important to note that SF has had no direct relationship with gold’s value over the last 115 years as Gold’s market capitalization held valuations between $60B to $9T, all at the same SF value of 60.

Plan B, using the SF model, predicted that the Bitcoin will rise to a market value of $1T after the May 2020 halving yet we have witnessed a decline in the value of Bitcoin in recent months. It is valid that Bitcoin can be considered as a scarce digital resource and it could very well retain its value in the long term. However, the assumptions of the Stock to Flow model are not strong enough to accurately predict the future market valuations of Bitcoin. Other factors such as volatility and external conditions like Black Swan events should be considered.

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# **References**

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Binance Academy. (n.d.). *Bitcoin and the Stock to Flow Model*. Retrieved from Binance Academy: https://academy.binance.com/economics/bitcoin-and-the-stock-to-flow-model

Cordeiro, N. (2020, June 30). *A CHAMELEON MODEL - WHY BITCOIN’S STOCK-TO-FLOW MODEL IS FATALLY FLAWED*. Retrieved from Strixleviathan.com : <https://strixleviathan.com/blog/2020/6/29/a-chameleon-model-why-bitcoins-stock-to-flow-model-is-fatally-flawed>

(Please show your workings). Yara Inc is listed on the NYSE with a stock price of $40 - the company is not known to pay dividends. We need to price a call option with a strike of $45 maturing in 4 months. The continuously-compounded risk-free rate is 3%/year, the mean return on the stock is 7%/year, and the standard deviation of the stock return is 40%/year. What is the Black-Scholes call price?

Solution

2. Computer Science

-Why is it a bad idea to use recursion method to find the fibonacci of a number?

3. Maths

(Please show your workings). Over all real numbers, find the minimum value of a positive real number, y such that

Solution

The minimum value is evaluated at =0

From

Squaring both sides

∴

For minimum value, if , then y(a) is the minimum value of the function. if , then y(a) is the maximum value

From