BITCOIN'S STOCK-FLOW-MODEL

Bitcoin has existed for over a decade now, invented in January 2009 by **Satoshi Nakomoto.** They've been a lot of predictions, anticipations, and speculations as to how it would revolutionize the fintech Industry. One of the aspects where there is still an ongoing challenge in the Bitcoin and other cryptocurrency world is in predicting its value, price, and market capitalization. To address this challenge different people have come up with different models that can be used to predict Bitcoin's future price and value. One such model is the **"STOCK-TO-FLOW"** model also known as the S2F model. This model was introduced by an early Dutch bitcoin adopter and has anonymously shared his opinions using the pseudonym **plan B.** The S2F model as proposed by "plan B" modeled Bitcoins's values based on scarcity and suggests that the stock-to-flow ratio - (ratio of total amount ever produced to the total amount produced annually), is what drives the price of Bitcoin. While this model arrives at a positive conclusion that points to a continuous increase in the price of Bitcoin in the coming years, since its S2F ratio increases while the total amount produced annually decreases every four years as a result of halvings, thereby resulting in its scarcity and making it more valuable. However, this model is questionable as certain differences exist between gold and bitcoin, and also fails to pass some other econometrics check.

From a conceptual and theoretical standpoint, some arguments can be presented as to why this model fails.

- "Physical gold cannot be reproduced, not for lack of trying, though hundreds of years of alchemy. Digital gold, however, can be reproduced using 'digital-alchemy' (forks or improvement of the protocol)," - *Israel-based tech group Alef Bit Technologies.*

  Therefore, a model that values physical elements by their **scarcity**, cannot be used to value 'digital-elements' or crypto-assets.
- Stock-flow does not have a direct relationship with gold's value over the last 115 years. Gold's market capitalization held valuations between ~$60B to ~$9T, all at the same SF value of 60. A range of $8T is not very indicative of explanatory

power and lends itself to the obvious conclusion that other factors drive gold's USD valuation.

From an econometric point of view, different researchers have pointed to the reasons why the S2F model fails an econometric test. Here is one:

> "PlanB chose to test H0 (The value of Bitcoin is a function of the stock-to-flow of Bitcoin) by fitting an Ordinary Least Squares (OLS) regression on the natural log of the market capitalization of Bitcoin and the natural log of the stock-to-flow. There was no accompanying diagnostics nor any identified reasoning for the log transformation in both variables, other than the idea that a log-log model can be expressed as a power law. The model did not take into account the possibility of a spurious relationship due to non-stationarity" - *Nick Emblow*

The S2F model has its credence based majorly on three supporting evidence:

- High R^2 between the log of S2F <> and log of market cap (~ 0.95)
- A coin integration test (// write something here)
- Consistency of the relationship for other scarce assets like gold

There are, however, counter-arguments that point to the inaccuracy of these supporting evidence both from a theoretical and econometric standpoint, therefore making the stock-to-flow model "bad" and not a very reliable model to be used in predicting the price/future value of Bitcoin.