**BITCOIN STOCK TO FLOW (S2F) MODEL - A Highly Flawed Model**

*Imagine an asset pricing model based on the assumption that there is no uncertainty about any asset’s returns. …No serious person would suggest that the predictions of the model should be subjected to rigorous empirical testing before rejecting it. The model can be rejected simply on the basis that a critical assumption is contradicted by what we already know to be true.*

Chameleons are particularly difficult to spot and dispute because they appear to be meaningful. It’s only under further scrutiny that you realize they are built upon assumptions that do not map to what we know about the real world.

# Introducing Stock-to-Flow

PlanB’s paper “[Modeling Bitcoin Value with Scarcity](https://medium.com/@100trillionUSD/modeling-bitcoins-value-with-scarcity-91fa0fc03e25)” states that certain precious metals have maintained a monetary role throughout history because of their unforgeable costliness and low rate of supply. For example, 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. PlanB then argues that this same logic applies to Bitcoin, which becomes more valuable as new supply is reduced every four years, ultimately culminating in a supply of 21 million Bitcoin.

Low rate of supply, which PlanB defines as “scarcity”, can be quantified using a metric called Stock-to-Flow (SF) which is the ratio between current supply and new supply:

This premise is then translated into the hypothesis, “…that scarcity, as measured by SF, directly drives value.” PlanB then plots Bitcoin’s SF against USD market capitalization as well as two arbitrarily chosen SF data points for Gold and Silver.

PlanB then runs a linear regression using the natural logarithm of Bitcoin’s SF metric as the independent variable and the USD market capitalization as the dependent variable. The linear regression derives the following equation:

In(USD Market Capitalization) =3.3 \* In(SF) + 14.6

PlanB suggests that an investor can forecast the future USD market capitalization of Bitcoin using the above formula. This has helped give credence to those $100,000 Bitcoin projections.

# Problems abound

There are several deficiencies within the paper, both in its theoretical proposition and its empirical foundation.

From a theoretical foundation, 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’s market capitalization against Bitcoin’s trajectory.

The second is the naïve application of a linear regression that results in a high probability of a researcher finding spurious results. “Good” statistical results, such as a high R-square, do not constitute a meaningful finding. It is common for researchers to underestimate how often such techniques lead to spurious results. Particularly in this situation where there is a large degree of freedom in which a lot of random data can be fit to a specific outcome.