Q1A- BitCoin Stock to Flow model and its crtique

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Purple clothing material was once on par with gold as a precious item. The nobility of ancient Greece wore this purple with such great pomp. Fast forward to today, and a purple shirt would get you absolutely nothing at a pawn shop- this loss of value can be attributed to the primordial human nature of associating value with scarcity. Gold, Silver, and other precious metals have maintained this relative scarcity over centuries. Bitcoin can also be thought of as a digital precious-metal, which can only be transmitted through electronic communication channels.

The basic premise of the stock-to- flow model lies in the scarcity of the object. A more useful definition of scarcity as opposed to *"Just being hard to find"* is given by Szabo[1] as *"Unforgeable costliness"*. Bitcoin possesses this value of unforgeable costliness because it costs a significant amount of electricity to produce, and above all, this process cannot be faked. It then follows that since Bitcoin's production is tedious, the dangers of oversupply are almost non-existent -thus ensuring a long term relative scarcity.

Saifedean Ammous[2] then introduces scarcity in terms of stock-to- flow (SF) ratio. The opening premise is logical - doubling the output of and dwarfing the supply of existing stockpile will do well to crash the price of any item. On the other hand , if doubling the output makes no significant dent on the existing supply, then the said commodity is said to have a high stock-to-flow ration. As an example, the number of Bitcoins produced in 2017 less than 4% of the existing coins in circulation. This means that even if double the coins were produced, the effect on the existing stockpile would still be insignificant.

Thus the SF (stock-to- flow) ratio is given as $\frac{stock(total\ commodities\ in\ existence)}{ratio(yearly\ production)}$. Since the supply of Bitcoin is fixed, the SF is bound to decay exponentially, thus decreasing the supply growth rate. The stock-to-flow model establishes the relationship between the SF and the price of Bitcoin. Fitting a linear regression to the data confirms the relative validity of the model [3].

The first obvious problem with the model is the causality fallacy i.e correlation does not imply causation. This also raises the existence of an underlying fat tailed distribution. As a thought experiment: Plot the average well being of a Turkey being reared for Christmas. The graph first slopes upward very nice and easy until the day the farmer swoops in a fit of hunger- figure 1 shows this phenomenon.

The problem can be seen if the regression graph is extended into the future and the price of bitcoin exceeds all projected monetary supply of the world by costing $235,000,000,000. All of these problems lie in the fact

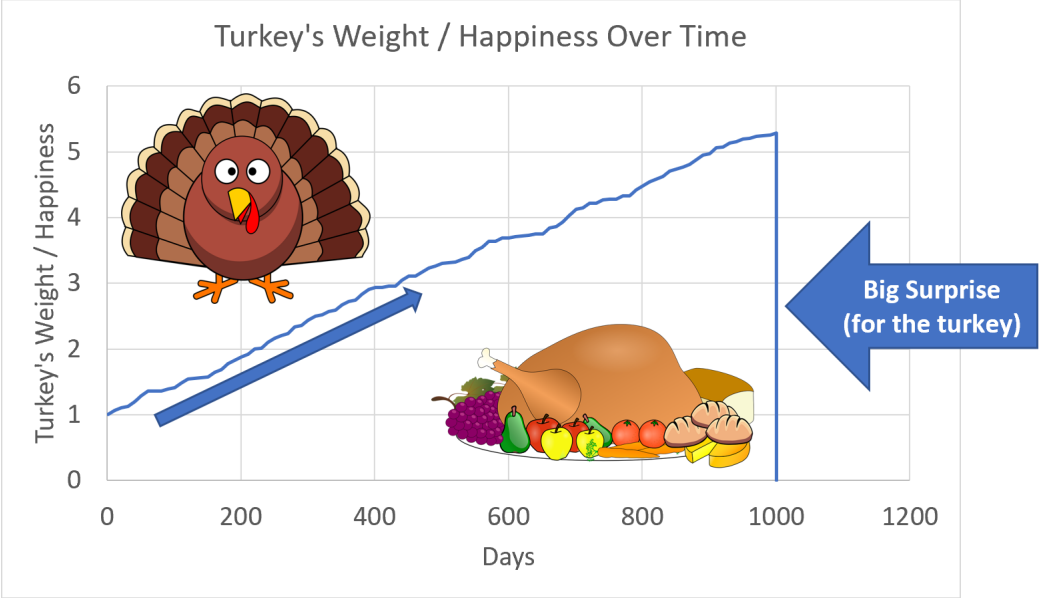

Figure 1: Failure of regression to establish causality in the life of a lovely turkey

that a naive application of linear regression is bound to produce "too good to be true" results.

Thus, in the absence of further rigorous empirical analysis, the stock-to-flow model should leave any potential investor with a high degree of scepticism.

References

[1] https://unenumerated.blogspot.com/2005/10/antiques-time-gold-and-bit-gold.html — Nick Szabo, 2008

[2] The Bitcoin Standard: The Decentralized Alternative to Central Banking — Saifedean Ammous, 2018

[3] https://medium.com/@100trillionUSD/modeling-bitcoins-value-with-scarcity-91fa0fc03e25 — Plan B, 2017