Answers

1. Finance

Stock flow model is a way to measure the abundance of a particular resource. The stock flow ratio is the amount of a resource held in reserves divided by the amount it is produced annually. Bitcoin is the first digital object that cannot be copied, duplicated, pirated or forged. Those are the primary attribute that give its unique value. Bitcoin is the first digitally scarce thing known to mankind, and within its inner workings is a mathematical mechanism that should make bitcoin continue to rise.

Stock to flow is defined as the relationship between production and current stock that is out there.

SF = stock / flow

The stock to flow is the number that is gotten when we divide the total stock by the yearly production(flow). It states how many years are required at the current production rate in order to produce what’s in the current stock. For example, gold has the production rate of around 2.000 metric tonnes and the current stock in the whole world is estimated to be 185.000 metric tonnes. If it’s calculated using the previous formula:

185.000 / 2.000 = approximately 93

At the current production rate we need 93 years to dig out all the gold that’s currently in the circulation. The higher the number the greater the scarcity. Now this can be related to bitcoin. There are around 18 million bitcoins in circulation as at September 2019 and 1.800 BTC are generated every day (657.000 per year). So when this values in inserted into the stock to flow formula:

18.000.000 / 657.000 = 27

Bitcoin stock to flow model essentially treats Bitcoin comparably to scarce commodities like gold or silver.

While stock to flow is an interesting model for measuring scarcity, it doesn’t account for all parts of the picture. Models are only as strong as their assumptions. For one thing stock to flow relies on the assumption that scarcity as measured by the model, should drive value. According to critics of stock to flow the model fails if bitcoin does not have any other useful qualities other than supply scarcity. The valuation of an asset requires taking into account its volatility. If the volatility is predictable to some extent, the valuation model may be more reliable. However bitcoin is notorious for its large price moves.

While volatility might be deceasing on the macro level, bitcoin has been priced in a free market from its inception. This means that the price is mostly self regulated on the open market users, traders and speculators. Combine relatively low liquidity and bitcoin is likely to be more exposed to sudden spikes of volatility than other assets. So the model may not be able to account for this either.

Black swan events may also undermine the stock to flow model, a black swan event by definition has an element of surprise.

The stock to flow model measures the relationship between the currently available stock of resources and its production rate. It’s typically applied to precious metals and other commodities but it’s also applicable to bitcoin. The stock to flow model is as strong as its assumptions and it may not be able to account for all aspects of Bitcoin valuation.

* C = StN(d1) – Ke-rt N(d2)

Where :

d 1  = ln st/k + (rt o2/2)t

And

d 2 = d 1 – os (sqrt(t))

Where :

C = call option price

S = current stock $40

K = strike price $ 45

R = risk free interest rate 3%/ year = 3/100 = .03

T = time of maturity 4 months = 120 days

N = a normal distribution

O = standard deviation of log returns 40%/ year = 40/100 = 0.4

d 1 = ln(40/45) + (.03+0.5(0.4)2 ) (120\*365) / 0.4 \* sqrt (120/365)

d 1 = -0.1177 + (0.03 + 0.08)(0.328) / (0.4)(0.57)

d 1 = -0.1177 + (0.11)(0.328) / 0.228

d 1 = -0.1177 + (0.036) / 0.228

d 1 = -0.0817/0.228

d 1 = -0.358 approximately 0.4

d 2 = -0.358 – 0.4 sqrt(120/364)

d 2 = -0.358 – 0.229

d 2 = -0.587 approximately – 0.6

Using st norm table <https://drive.google.com/file/d/0B0P2EkcqnemKYjAzNjY3MjUtZDk5Yy00NzUxLWEwYjgtYWNkNDk0Mzk2MjIz/view>

N(-0.40) = 0.3446 for d1

N(-0.60) = 0.2743 for d2

C = (40)(0.3446)-((45)/e0.3\*(120/365))(0.2743)

C= 13.84-(45/1.103658)(0.2743)

C= 13.84 – (40.77)(0.2743)

C = 13.84 – 11.183

C = $ 2.657

2 Computer science

Recursion takes longer time if it is used to find a large Fibonacci number like 70 but iteration is a faster approach.

* Using c++

using namespace std;

// function to check power of two

bool isPowerOfTwo(int n)

{

return (n && !(n & (n - 1)));

}

// Given number is Proth number or not

bool isProthNumber(int n)

{

int k = 1;

while (k < (n / k)) {

// check if k divides n

if (n % k == 0) {

// Check if n/k is power of

if (isPowerOfTwo(n / k))

return true;

}

// update k to next odd number

k = k + 2;

}

return false;

}

int main()

{

int n = 25;

// Check If n Is Proth Number

if (isProthNumber(n - 1))

cout << "TRUE";

else

cout << "FALSE";

return 0;

}

* Maths

Y = sqrt ((x+6)^2+25)+ sqrt((x-6)^2+121)

Y = sqrt((x+6)^2+25)+((x-6)2/2+121)

Y = ((x+6)+25)+(x+115)

Y = (x+6+25)+(x+115)

Y = (x+ 31)+(x+115)

Y = x+31+x+115

Y = 2x + 146