



# Risk to Bitcoin Increases

## Executive Summary

We are providing a follow up to our Research Note of March 11, 2020.

- Bitcoin's correlation with equity markets has increased substantially over the past 8 days.
- Beta, a measure of risk, has increased substantially over the past 8 days.
- In our opinion there is considerable downward pressure on equity prices in the near term which could extend into the next several months. **The increased correlation and risk could cause bitcoin's price to fall substantially further over that time frame.**

## Correlation and Beta of Bitcoin Returns to S&P 500 Returns

First, we looked at whether S&P 500 return was a significant determinant of bitcoin return, using linear regression techniques and lagged variables. We used lognormal returns, defined as

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

Second, we lagged each return so that we examined

$$r_{B_t} = f(r_{B_{t-1}}, r_{S_t}, r_{S_{t-1}})$$

The period covered January 21, 2020 through March 17, 2020. Data sources are: bitcoin: coinmetrios.io; S&P 500: finance.yahoo.com.

We looked at two levels of granularity: daily returns and weekly returns. We also studied the 8 days prior to and including March 17, 2020.

We have two findings:

- The correlation between bitcoin returns and S&P 500 returns has increased over the past 8 days. For daily returns,  $R^2$  has risen from 58% to 86%.

- Beta for bitcoin versus S&P 500 returns has increased. For daily returns, beta has risen from 2.1 to 3.5. The beta for weekly returns stands at 2.76.

Statistically speaking, this means that

- A one-day 7% drop in S&P 500 prices could translate into a 20% drop in the price of bitcoin.
- A one-week 20% drop in S&P 500 prices could translate into a 40% decline in the price of bitcoin.

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