



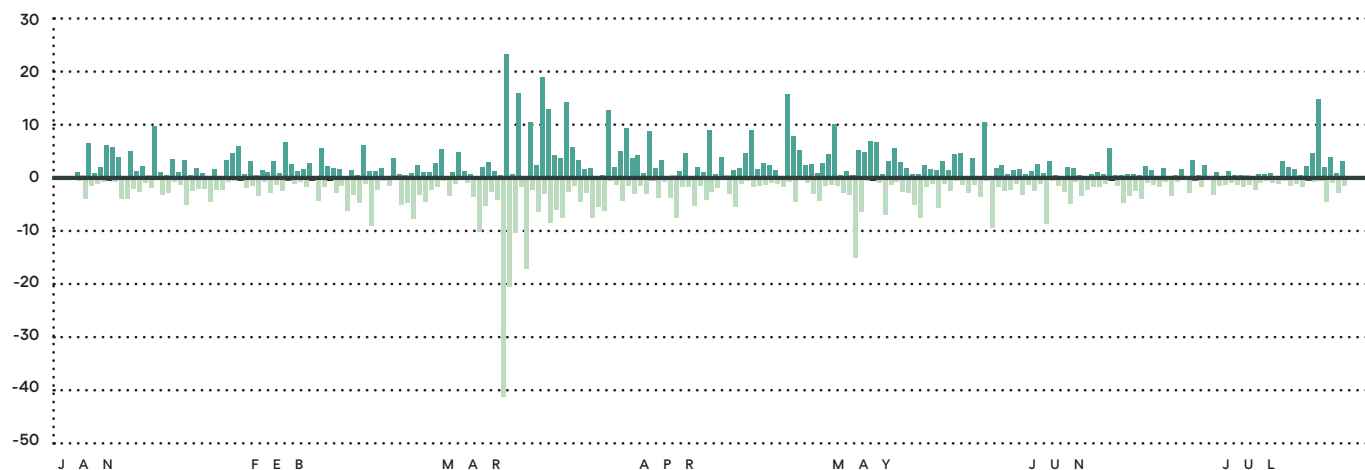
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Are Blockchain Limitations Stifling Arbitrage Opportunities? Part 2



Are Blockchain Limitations Stifling Arbitrage Opportunities?

1: 2020 Bitcoin Daily Percentage Change From Open to High and Open to Low (%)



Recap

In the first part of this series, Copper showed that slow blockchains are still heavily utilised for cross-exchange Bitcoin movement that continue to see massive inflows daily. A Bitcoin transaction from one exchange to another is taking nearly 10 minutes on the average - and that's just blockchain time, not accounting for exchange delay procedures. And the majority of transfers aren't happening from the smaller retail trader, but professional outfits with deep pockets (or what the industry continues to dub as 'whales'). This trend is growing. Part and parcel is the fact that with more exchanges, liquidity is further decentralised and diluted. And with the popularity of derivative products growing, the opportunities range even further for professional traders.

Having completed the on-chain research for this series, Copper, now seeks to provide an even deeper analysis of exchanges looking into price movements and volatility, trading volumes, and order books to best assess the effects of timing on arbitrage opportunities. This latest series looks at how much opportunity, if any, is missed during the 10 minutes it takes to move Bitcoin from one wallet to an exchange.

The surge in the number of cryptocurrency exchanges since mid-2017, just before Bitcoin began stealing global headlines, has led to an onslaught of ingenious product structures. Bitcoin futures, options and market-maker rebates have all become popular methods of attracting liquidity from competing exchanges.

Blockchain analytics firm Chainalysis has previously provided Copper with data, indicating that approximately 4 million Bitcoins sit on exchanges at any given time, with a vast majority circulating from one exchange to the next in a perpetual loop (See Copper Research - Why Bitcoin Fundamentals Are Hard?).

Boom or Bust?

The underpinnings of trading remain the same across spot and derivative markets - Bitcoin needs to be 'physically' traded on the exchange. And cryptocurrency allows users such freedom in a grand style unseen by any other asset class.

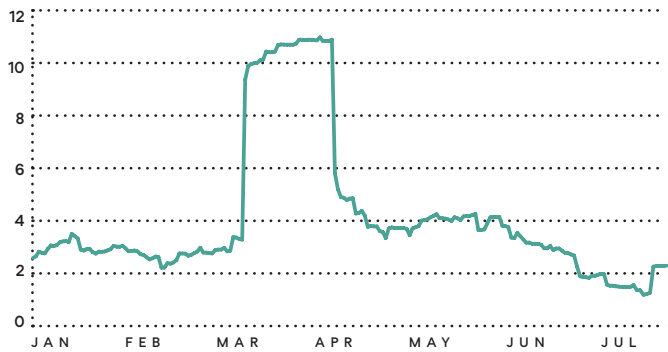
In short, the blockchain feature of speedy transfer and ownership of assets is one that bodes well for traders. But it can act as a double-edged sword for exchanges, which are a few clicks away from losing that liquidity to another exchange.

The blockchain transfer speed of 10 minutes for ultimate final ownership is a unique feature not found in traditional finance.

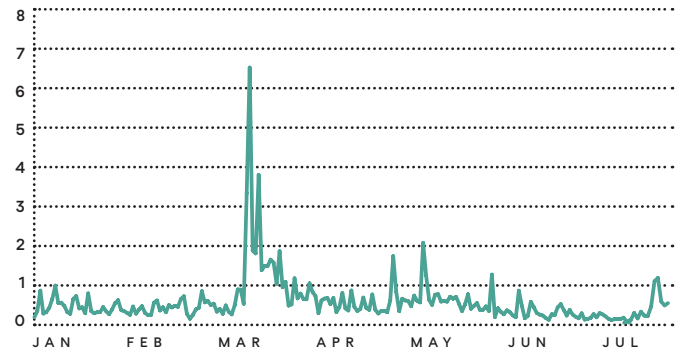
But in the realm of Bitcoin trading, the transfer speed might fall short of groundbreaking when assessed alongside the volatility swings that cryptocurrency is renowned for and traders seek to take advantage of.



2: 2020: Bitcoin 30-Day Rolling Volatility (%)



3: 2020: Bitcoin 8-Hour Rolling Volatility (Daily Average) (%)



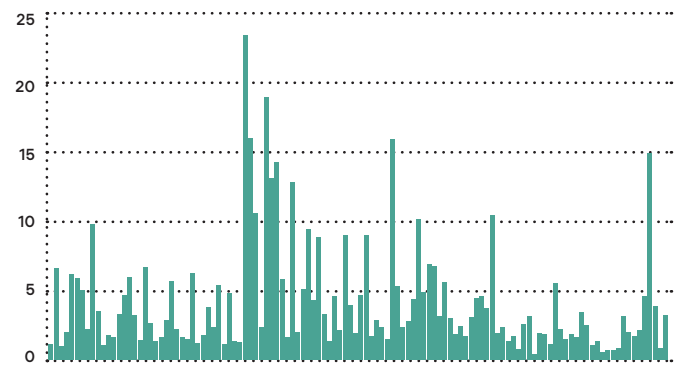
Bitcoin's 30-day rolling volatility had held between 2-4% outside of April and March this year when global markets took a significant turn in both directions fairly sharply (see chart 2). But volatility had hit new lows going well under 2% at the end of July 2020. But that assessment might not be all that meets the eye. Daily swings from Open to High and Open to Close (defined within 24 hours UTC) still show plenty of opportunities.

Up until the end of July, Bitcoin has closed the day higher than it started 55% of this year. The cryptocurrency saw a 4% average uptick on days where the market had bullish sentiment (see chart 4). Most notably, when Bitcoin had positive traction, the price swings can be reasonably significant and enough to persuade traders to begin shifting liquidity to find better bidders across multiple exchanges combined with rebate and leverage tools.

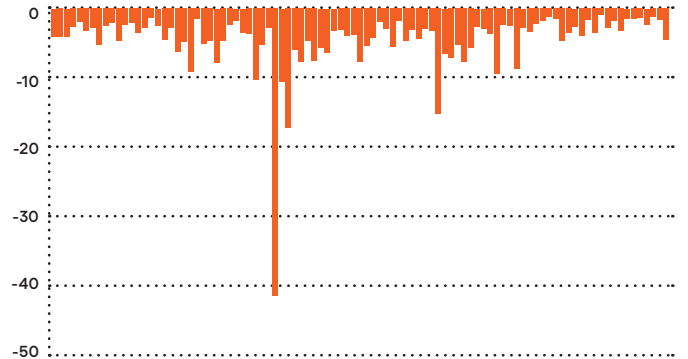
But shorting seems to be amiss in replicating the similar bullish pattern. Bearish sentiment fares evenly across the board, for the most part, on days that Bitcoin closed lower than its opening price (see chart 5). The majority of opportunities remained with percentage changes between 0 and 2% regardless of direction (see charts 6 & 7).

The question that comes to mind is, how long do price movements more significant than the 2% norm last for?

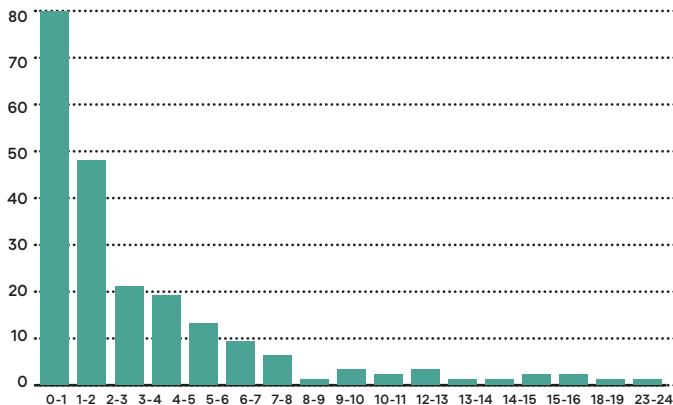
4: Bitcoin % Change to the High on Days that Closed Positive in 2020



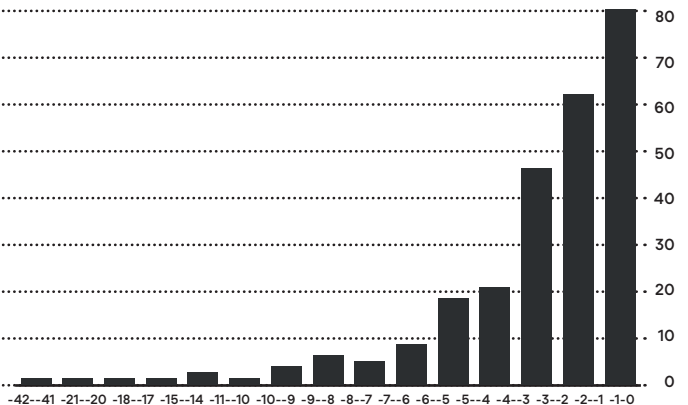
5: Bitcoin % Change to the Low on Days that Closed Negative in 2020



6: # of Days Bitcoin's Price Moved by Percentage Change From Open-High (%)



7: # of Days Bitcoin's Price Moved by Percentage Change From Open-Low (%)





Gone In 10 Minutes

Copper looked at the most vicious days when Bitcoin's price experienced swings even the best of traders would have been concerned about.

In 2020, the majority of volatility, what traders are indeed hungry for, happened during March.

Black Thursday, as it came to be called, saw Bitcoin's price drop from nearly \$8000 to a low as little above the \$4600 mark, with derivative traders suffering massive liquidations along with it. But what should be noted is that Bitcoin's price change does not come in gradually but rapidly and with force.

In fact, looking at price change movements every 10-minutes, a time frame purposefully chosen to account for the minimum time to transfer Bitcoin onto an exchange on a non-congested blockchain shows that the opportunity goes away within this confirmation period the majority of the time.

On Black Thursday, within 20 minutes, Bitcoin's price had plunged over 15% (see chart 8). And such rapid scenarios reemerge the next day when Bitcoin's price rocketed back up over 20% from \$4500 up to \$5750 within a 10-minute timeframe (see chart 10).

Importantly, the total volume captured by market makers and takers is quite small (see charts 9 and 11). The pattern that continuously seems to appear is where liquidity runs dry quickly, and opportunities become less available on **any** exchange.

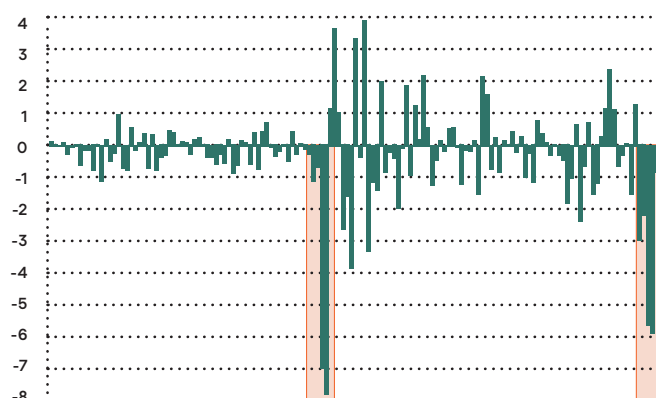
Market Makers Missing Takers

Even during the most volatile days, Bitcoin's significant movements happened within a short period. Anyone who had already parked their assets on the exchange was able to either earn or protect their assets from quick depreciation. And the pattern can be seen across the board on multiple days during high volatility (see charts overleaf).

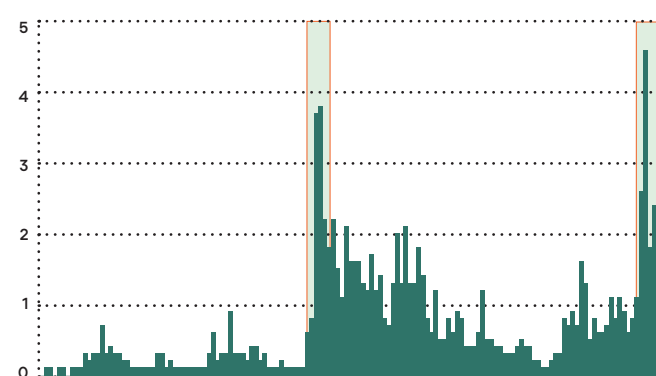
Outside of these massive spikes, Bitcoin continues to trade as usual within its normal bands as if there was no price shock. But what is becoming clear, as far as blockchain transfer speeds are concerned, is that the more significant opportunities in Bitcoin's price movements might be missed waiting for miner confirmations.

In the next series of this report, Copper will dig into the effects of blockchain times on bid-ask spreads and order-books to determine if these conditions make markets run inefficiently.

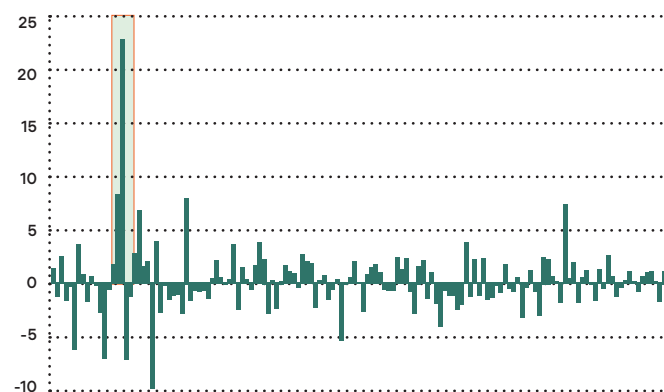
8: 2020-03-12: % Change Open-Close Every 10-Minutes



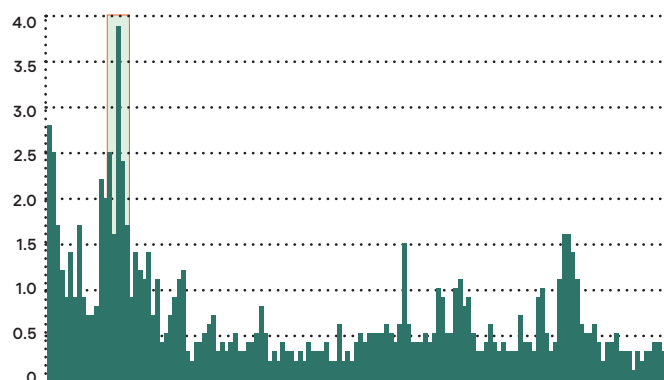
9: 2020-03-12: % Trading Volume Percentage of Day Total Every 10-Minutes



10: 2020-03-13: % Change Open-Close Every 10-Minutes



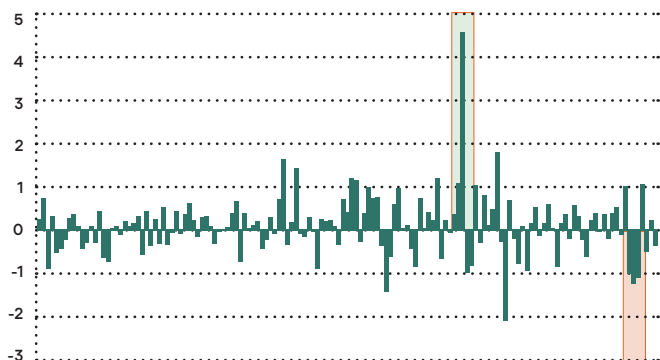
11: 2020-03-13: % Trading Volume Percentage of Day Total Every 10-Minutes



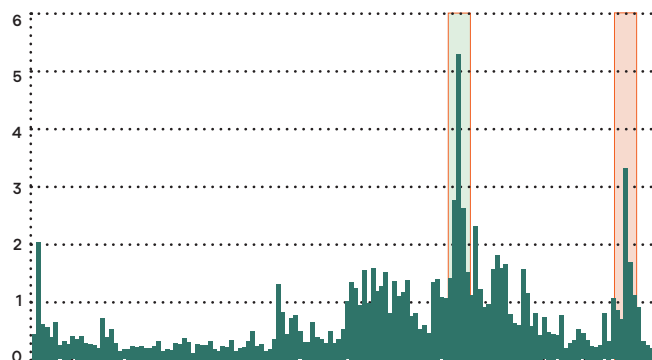


CONTINUED CHARTS
BITCOIN'S MOST VOLATILE DAYS DURING 2020

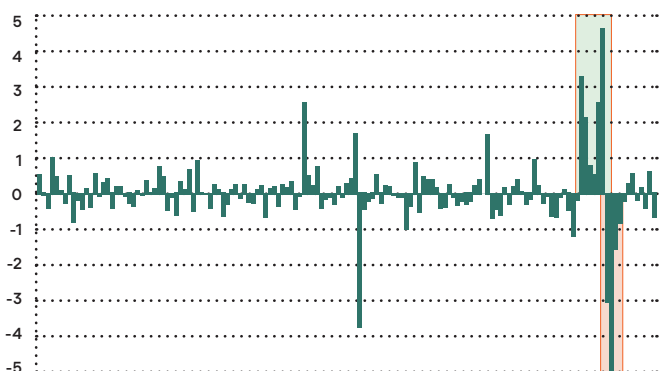
12: 2020-03-19: % Change Open-Close Every 10-Minutes



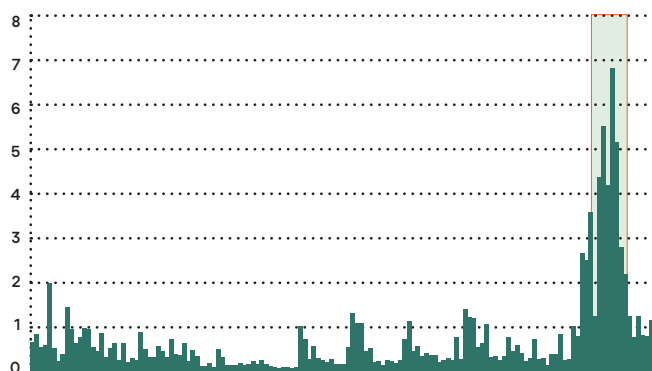
13: 2020-03-19: % Trading Volume Percentage of Day Total Every 10-Minutes



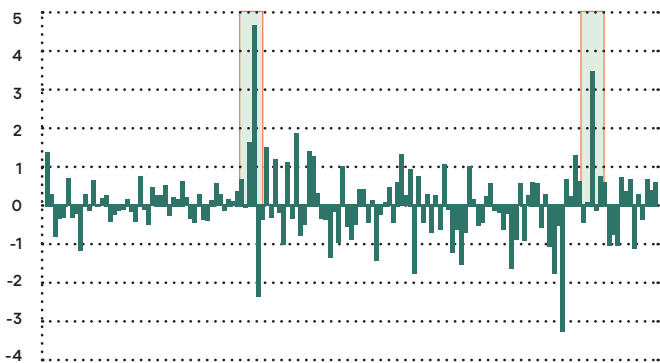
14: 2020-03-15: % Change Open-Close Every 10-Minutes



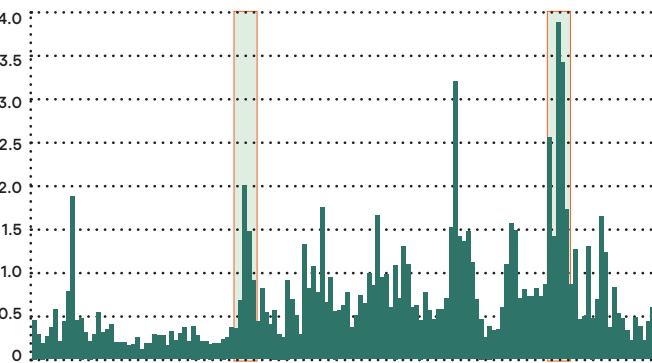
15: 2020-03-15: % Trading Volume Percentage of Day Total Every 10-Minutes



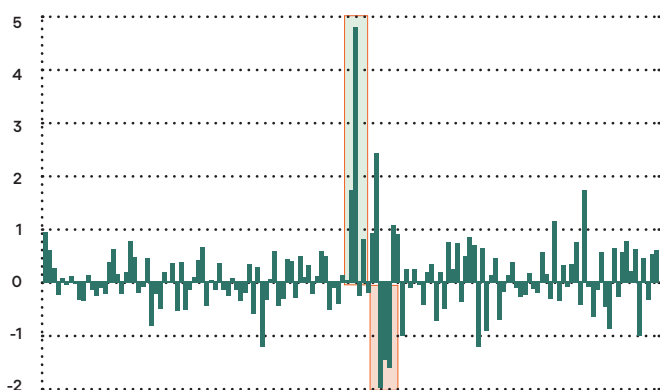
14: 2020-03-20: % Change Open-Close Every 10-Minutes



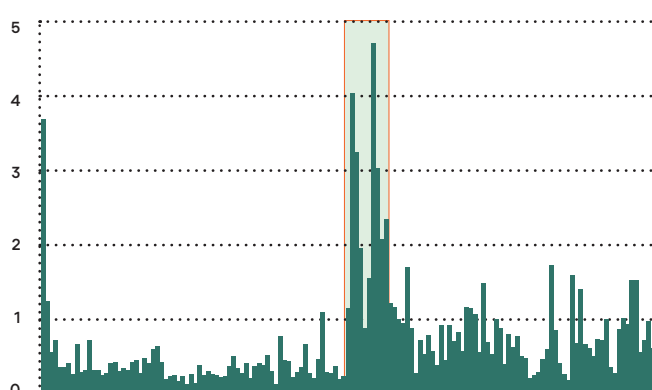
15: 2020-03-20: % Trading Volume Percentage of Day Total Every 10-Minutes



16: 2020-03-23: % Change Open-Close Every 10-Minutes



17: 2020-03-23: % Trading Volume Percentage of Day Total Every 10-Minutes



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