De-Coding Crypto

Weekly Analysis

Apocalypse now? Hash rate and the price floor

October 30, 2019

In this week's issue, we focus on the hash rate question, and tracking it to potential emergency downside scenarios as we move into 2020. We also take a look at Chinese moves on blockchains, and the implications for established cryptocurrencies.

Written by Joseph Edwards, Head of Research at Enigma Securities.

Our Market View

May you live in interesting times. An explosive week indeed; a temporary drop off that saw BTC briefly back in the $7400 range was entirely erased on Friday, as we briefly touched $10,500 in the early hours of Saturday. BTC is around $9100 at time of writing; we learn bullish but see several reasons for uncertainty, with the next week to 10 days likely to provide edification for the year-end.

Outside of BTC, a huge number of smaller coins rallied relative to both fiat and BTC, especially those with significant governance or use-case links to China, most prominently TRX. Both ETH and especially XRP struggled; we continue to lean long on ETH, but feel concerns should be growing about the upside potential in XRP.

Please direct all queries about this week's research to jedwards@enigma-securities.io.

Major

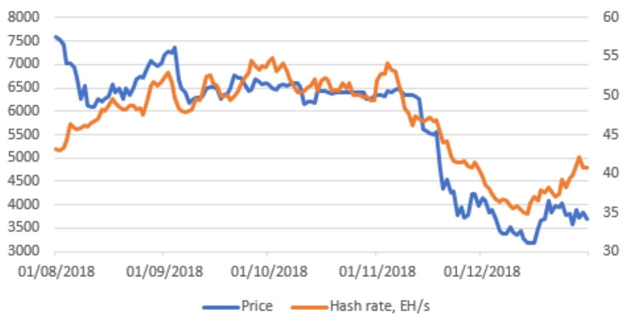
Ticker	Price	7D	1M	6M	12M	Cap
BTC	9106.81	20.67%	9.71%	57.79%	43.27%	164.1B
ETH	183.45	14.48%	2.29%	13.24%	-8.22%	19.87B
XRP	0.293348	6.96%	14.09%	-1.98%	-35.58%	12.68B
BCH	290.484	37.08%	27.07%	0.84%	-36.99%	3.96B
LTC	58.3508	18.61%	4.33%	-24.33%	13.95%	3.69B
EOS	3.27275	18.09%	11.45%	-33.18%	-38.58%	3.35B

Selected

Ticker	Price	7D	1M	6M	12M	Cap
BSV	132.051	36.55%	51.38%	153.80%	48.81%	2.38B
TRX	0.0202969	41.79%	41.57%	-12.13%	-12.21%	1.34B
NEO	10.499	50.86%	40.27%	13.39%	-36.02%	0.74B

Apocalypse now? Hash rate and the price floor

Amidst the euphoria of the weekend's crypto gains, we think it important to stop and take stock of the biggest source of worry on the horizon - that being, the threat of another mining crash. One of the big stories of last year's 'crypto winter' was that hash rate, a measurement of the aggregated processing power of the Bitcoin mining network, registered a steep decline throughout November and December at the same time as price also plunged:



Data via Blockchain.com and Cryptodatadownload.com.

While there have been occasional short-term drops (at least in part because hash rate is an estimate rather than an exact measure), there was absolutely no parallel for this in BTC's (admittedly short) history - hash rate kept steadily building even after previous price shocks in 2017 and 2018, and bear in mind that increasing efficiency of mining rigs by definition should generally increase (albeit it should be noted that 2016 release Antminer S9 still makes up close to a supermajority of active units, and presumably at least a plurality of processing power, according to a Coinshares report in May 2019).

As hash rate dropped, price did too. There is something of a chicken-and-egg element to this. On the one hand, hash rate is seen as a signal of miner confidence and hence a fall in hash rate is seen as a show of no-confidence in future price; on the other hand, a falling price itself reduces or destroys profit margins for miners, and we are long past the days of mining representing consistent pure profit.

[Estimates in September from Fundstrat's Alex Kern](#) put cost of mining at $7300-$8500 per BTC - this assumes by far the most popular card in the form of the Antminer S9 and $0.06/kwH electricity costs (very low, but reportedly still higher than generally available to miners in hydroelectric-heavy areas of China where production is concentrated, especially during the wet season).

We feel that the lower end of that estimate is a passable guide for something resembling a current floor for profitability; we have heard estimates that are lower still, but these generally exclude hardware and infrastructure costs ([Skew Markets, as of October 24th, estimated marginal production cost](#) - i.e. electricity only - for 1 BTC at $5260 on $0.045/kwH costing for instance) and therefore are less useful in practical terms. Substantial deliveries of new (and hence more efficient) products by market leaders Bitmain and Canaan in November should cause some reduction in average cost, but corresponding increases in electricity prices in the short term should on the whole keep outward estimations within sane boundaries.

We wrote in September of the danger of a death spiral downwards if the lower end ($7000-$7500 at the time) was seriously challenged However, the core concern still remains here with regards to profitability being potentially undermined.

This is what we wrote last week:

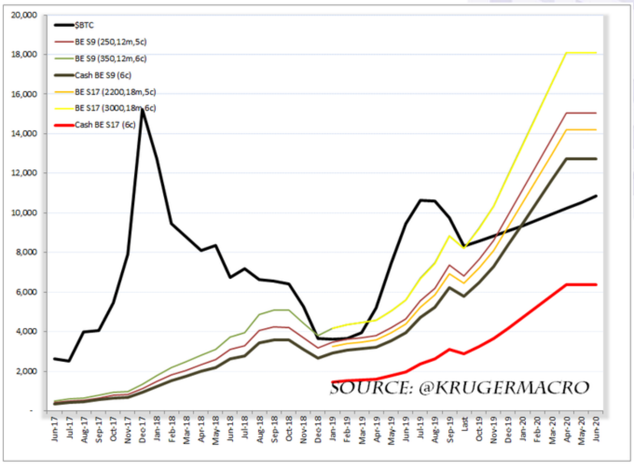
> We tend to think that there will be a breakout – most likely upwards – either late in this week or during the next; a lack of a breakout may be market-altering for the worse as we pass into a less than certain November and December.

The upwards breakout came through, and as it stands, we lean bullish for the time being. However, a key detail needs to be noted: this is not a threat that is off the horizon even if we maintain, for instance, a $9500-$10,000 range for an extended period. To briefly recap, the amount of BTC produced over a given period is effectively fixed, while hash rate can grow (and shrink) as it wants; therefore, every increase in hash rate means less profit per unit for miners. Let us take that $7300 estimate for BTC production (which, we should stress, is still probably slightly on the high side for miners taking advantage of cheap hydroelectric or other excess power, but is a serviceable enough estimate). We can simply divide by (normalised) hash rate on September 9th and re-multiply by current hash rate to get a rough estimate on what cost is today:

Date	HR EH/s	Cost
09-Sep	84.1	7300
28-Oct	97.8	8490

Hash rate data via Blockchain.com. 7-day MA.

Alex Krüger, an economist and long-time trader who has been one of the more nuanced voices in cryptocurrency analysis over the last few years (and has leaned bearish in recent weeks, though is long-term bullish and also currently short-term bullish), recently referred to this problem as the 'Bitcoin Miners' Apocalypse', offering this chart showing all major cards falling into unprofitability in the coming months:



Credit: Alex Krüger

Note that this chart was posted on October 25th, hence the much lower price for BTC than we are currently trading at. In any case, the key point here is that, assuming hash rate climbs as it has in general over the last few years, and the BTC price trend follows a moderate upward forecast, that most or all miners fall into unprofitability in very short order. Extrapolating out from $7300 again, we get this:

Date	HR(M)	Cost	HR(L)	Cost2	HR(U)	Cost3
09-Sep	*84.1*	*7300*				
10-Nov	100.2	**8698**	90.9	**7890**	108.7	**9435**
24-Nov	102.8	**8923**	89.0	**7725**	114.8	**9965**
08-Dec	105.4	**9149**	88.0	**7639**	120.1	**10425**
22-Dec	108.1	**9383**	87.5	**7595**	124.9	**10841**
05-Jan	110.7	**9609**	87.2	**7569**	129.4	**11232**
19-Jan	113.3	**9835**	87.2	**7569**	133.7	**11605**
02-Feb	115.9	**10060**	87.3	**7578**	137.9	**11970**
16-Feb	118.5	**10286**	87.5	**7595**	142.0	**12326**

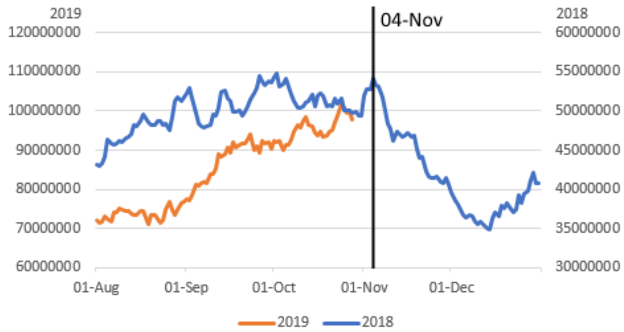
Hash rate data via Blockchain.com, exahashes per second. Hash rate extrapolated from trough (14/12/2018) to present via exponential smoothing forecast, left-to-right: median, lower bound, upper bound. 7-day MA.

This median projection for hash rate sees the rate, and therefore cost 'floor', climbing over $10,000 by February (a 40% increase on September); the upper bound has it over $12,000 (a 65% increase). Bear in mind that this represents a very basic numerical forecast (with no specific adjustments for potential real-world conditions), and that in general these figures should absolutely not be taken as any sort of gospel, but they provide an useful framework for understanding this floor threat going forward.

We do disagree as it stands with the 'miners' apocalypse' thesis being more likely than not medium-term; price gains are absolutely capable of keeping pace at existing efficiency levels at least through Q4 2019 and Q1 2020, particularly given that there will be a non-negligible increase in efficiency across the network as older hardware is swapped for more efficient alternatives (both Bitmain and Canaan will be shipping substantial inventories in November; this will probably not represent a seismic shift overnight, but it should contribute to significant increases in average efficiency as we approach the halvening).

Yet, there should be real concern about any approach towards that floor nonetheless - we were flirting with it even prior to Wednesday's dip, and while we don't need 2013 or 2017-level explosions to keep up, we do nonetheless need sustained upwards growth over the next two quarters, and – at current prices – few downward shocks.

Circling back to the hash rate itself, this is where we stand today, compared to 2018 and its local peak before the collapse:



Data via Blockchain.com.

Do we believe that we are on a cliff-edge? Again: our inclination is still no. 2018's crash was preceded by over two months of consistently flat trading - profits were eroded on both ends as hash rate and electricity costs both steadily increased (the wet season in Sichuan runs to October, and while dry season prices are still reportedly in the $0.04/kwH range, it still represents a significant cut into margins); we consider a similar sudden loss of confidence to be unlikely, especially with big players presumably being the first to come into receipt of 8nm cards.

That being said, we believe that both the 7-day moving average on hash rate and the price relative to the implied floor by hash rate need to be watched carefully - a major challenge to either would present significant downside risk.

China and blockchain: avoiding irrational exuberance

Let us start by making our position on this entirely clear: we absolutely are not denying that Xi Jinping's announcement on blockchain technology matters, and we are not denying that it at least to some extent helped to catalyse the run upwards over the weekend. As mentioned last week, we expected a breakout at the end of the week independent of any specific headline, particularly after Wednesday's dip, but even the biggest short-term optimist could not have called price climbing over 10,000 so soon in even a transitory form.

It clearly mattered, and we make this clear, in order to make the following clear: this was an exceptional move, on slightly less exceptional (albeit very important) news, and understanding that is going to be absolutely and vitally important to navigating the markets over the coming weeks and months.

First off, Friday's announcement does not signal a sea change in policy. While cryptocurrency in China operates in something of a grey market - as seen by Binance's public announcement of WeChat and Alipay OTC on-ramps, and the ensuing public denial by Alipay (and re-emphasis that crypto trading as a class was neither permitted nor tolerated) - it does still operate, and there has been little to suggest serious governmental pressure against it.

We would say 'save for the occasional crackdown on a random mining farm', but even this would be going too far; the most negative headline events have been like in April. Reuters' terrifying headline: "China wants to ban bitcoin mining". The reality: an extremely preliminary draft, broadly dealing with industrial restructuring, from the state planning commission had put cryptocurrency mining in the most negative of three categories.

On digital money and blockchain, while there has been a critical and populist line in local media, the reality on the ground has leaned far more positive than not. The project to create a 'digital yuan' (its CBDC, or central bank digital currency) has been underway for years and rumours of its development towards an imminent launch appear weekly in Western media at this point. On blockchain technology, China has enjoyed that familiar steady trickle of stories about one firm or another using a blockchain solution over the last year; they are very much integrated into the blockchain headline ecosystem if nothing else.

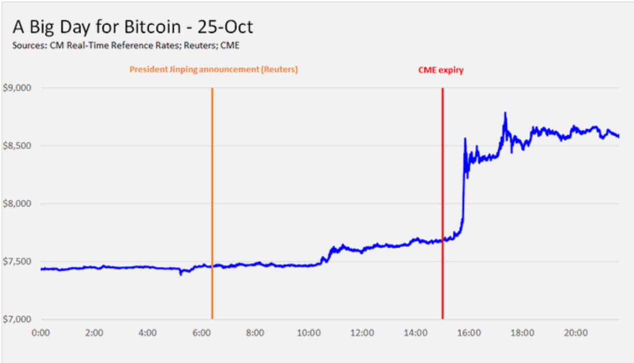
Does the Xi Jinping announcement change anything? [Blockchain and Web3 crypto investment firm Maple Leaf Capital via social media:]

> First one has to realize that in China, the policies follow the premiere's tone and permeates down. Xi sets the tone, subsidies and policies follow, and ultimately gets carried out in detail in local regions...The second thing is crypto / blockchain will no longer be called a fraud in public press – once Xi has spoken, it will be political suicide for any scholars or government officials otherwise. This is a tremendous 180-turn in public image.

We see this as a slight exaggeration of how hostile the situation was to date, but the fundamental point is valid - this solidifies a positive climate for blockchain technology in China, and insofar as one can even say this over this sort of period when talking about crypto, it generally should be seen as a bullish contribution for BTC over the next couple of years, even though it must be stressed that this announcement does absolutely nothing to, for instance, ensure the long-term effective legality of BTC or any other cryptocurrency in the state.

The danger is getting carried away by headlines as they come, because outside of Friday, they have catalysed little. Take the aforementioned report in April, seemingly designed to cause panic: on the day it came out (9th April), BTC opened at $5256, having just climbed from a long period in the $4000 range. End of day, $5208. Next day, $5317. BTC traded roughly in its new range in fact all the way through to 4th May. Looking the other way, headlines about the digital yuan and China's imminent entry to cryptocurrency dominated in mid and late August; in 'response', the market barely moved from August 15th until Bakkt week on September 23rd.

The severity of Saturday's spike was very, very clearly the result of short-term speculation and a brief bubble; while we absolutely see a possible route up towards a stable $11,000 in November now, a local high of 30+% growth intraday is obviously aberrant. The crucial point to understand is this:



Credit: CoinMetrics.

There will be a natural, slightly contrarian, temptation to look at charts such as that one (which, to be 100% clear, was intended to indicate a lack of a simple causal relationship), and in general to look at the increasing number of market movements during primarily Asian trading hours, and to look at it as an easy opportunity to front-run. We would caution against this; while we remain short-term bullish anyway, we do not see this class of news in general as a particularly powerful or reliable catalyst for market movement, and believe it will be an important trap to avoid over the coming months.

China and blockchain: the legal perspective

By Alina Kiselevich

Even though cryptocurrency trading is still legally banned in China and the country is only planning to launch their own digital currency, on October 26, the new national law (meaning it is binding within the country) has been adopted by China's Congress, or, easier said, 'the cryptography law', which is initially the first law of the country to regulate data encryption. The law is about to take effect starting from the 1st of January, 2020.

Cryptography, being an essential part of blockchain technology, might not only become the key to increase the country's competitive ability on the global market, but also a means to promotion of crypto development and guarantee to sound cybersecurity within China.

By digging deep enough, it is possible to see the process of 'hatching' CBDC in China being quite logical and structured, considering the country's passion for security in every field. The current law might even be called the first stage of doing so. From the 1st of January, 2020, it will be legally punishable to leak any data that can be damaging to the security of government authorities or to violate established safety principles. Moreover, competent authorities will control cryptographic standards as well as pay attention to the training of qualified specialists in the field.

All of this makes it harder for the security of the country to be violated in later stages of launching of digital currency. The legislation is clear and well-structured, but represents the introduction of a significant body of regulation, and it makes total sense as to why it is not happening all at once.

This brings us to the event that took place last week, when Facebook's CEO Mark Zuckerberg appeared before the House Financial Services Committee to discuss the cryptocurrency project, Libra. He was quoted saying that because Libra "will be mostly backed by U.S. dollar", Chinese superiority in the digital currency space could put the "U.S. dollar at risk".

The validity of what Zuckerberg stated is supported by many financial analysts. For instance, RBC Capital Markets analysts have stated that dismissal of Libra might let China's central bank digital currency dominate in emerging economies and "may be strategically positioned to become the de facto global digital currency in emerging economies".

That does not mean, though, that invoking China as a threat from Zuckerberg's side was not an intention to "promote" Facebook's stablecoin offering. Both are true. It was also true that the lawmakers in the House Financial Services Committee weren't really impressed with his testimonies. It is not a very good move to involve statements challenging the U.S. currency, even though it is pretty clear what he was coming from.

On October 24, Chinese President Xi Jinping addressed the importance of research and investment into blockchain, naturally followed by jump of bitcoin's price. This could be a subsequent stage to what was stated earlier, a follow-up to the smartly scheduled process of bringing CBDC to life. It all really seems like a much wider plan, likely something of a cold-war nature between China and the United States.

The negative legal nature of China's relationship towards crypto is changing drastically, looking at all the possibilities it can bring for a country on the global and domestic scales and losses, if not embraced.

What we're reading

Bitmain secretly files for US IPO with SEC; Deutsche Bank is the sponsor (The Block Crypto): Bitmain has been in something of a tumultuous state over the last couple of days, with Jihan Wu seizing control of the company from Micree Zhan in somewhat murky circumstances. The situation remains very unstable, but prominent observers (primarily Coindesk advisor Dovey Wan) have noted that Bitmain has been losing market share to competitors recently and that there have been questions over the efficacy of Micree Zhan's leadership for a while.

Bitmain competitor Canaan publicly files for $400M IPO on Nasdaq (The Block Crypto): This came out a day before the Bitmain IPO announcement, and at the time of writing, the F-1 had actually been released. As noted, the main surprise was that the company was not profitable across the year up to June 2019, though this came in the context of crypto winter, a lack of any significantly improved products until April, and a schedule that put the focus on production and release of the 8nm cards in September-November 2019. We eagerly anticipate the details of the Bitmain filing, but we tend to see IPOs reaching this stage on relatively modest valuations as more good than not regarding the long-term health of the crypto mining industry.

China: WeChat Searches for 'Blockchain' and A-Share Stocks Skyrocket (CoinTelegraph): Chinese metrics always need to be taken with a huge grain of salt, but this is the crux of the bull case regarding China and BTC, ETH, et al.: the grey market is going to remain grey, but the potential market is big enough that anything hat points people in the right direction can make a major difference to adoption.

US Financial Regulators Join UK FCA's 'Global Sandbox' (Coindesk): There has been a lot of concern about the FCA and crypto regulation in the UK over the past few weeks. We are honestly not sure why. The FCA has taken a fairly progressive approach to crypto over the last few years, and despite the constant murmurs about a draconian turn, we very much take the tack here of believing it when we see it.

Bullish Bakkt: Company Launches New Products as Futures Trading Surges (CoinTelegraph): Futures options are the next brick in the Bakkt pyramid. Will it change everything overnight? No, but this is far more interesting than the futures product was, and definitely sets the stage for more to come. We are far more excited about this than the other major Bakkt headline of the week of them partnering with Starbucks to sell coffee with BTC, which is approximately a world 429125th.

Telegram Token Investors Reject Refund Offer (Coindesk): ""We are happy to share with you that we have successfully obtained the consent of a significant majority of investors in both the Pre-Sale and Stage A to extend the deadline for the Network Launch to 30 April 2020. We would like to thank everyone for your support. This extension allows us to proceed with the necessary regulatory work described in our last e-mail."" And on it goes…

Until next week – thank you for reading.

ENIGMA SECURITIES

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Owned by Makor

New York
Park Avenue, 6th Floor 430

London
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,World Trade Center, 6 Bayside Road