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RESEARCH BRIEFING: ON-CHAIN DATA

Recently, global markets have been under pressure due to a collection of unfavourable macroeconomic conditions developing since the tail-end of 2021. These conditions include higher than expected inflation and a consequent expectation of rate hikes, monetary tightening by the Federal Reserve and the Ukraine-Russia conflict.

Although each individual global market trades off their own fundamentals, a stark correlation across all assets has occurred since Q421. Large positive correlations tend to exacerbate during turbulent times, which is why this correlation has increased significantly during the downtrend from market highs in November. As the correlation continues, with crypto markets tied to the "risk-off" narrative, the on-chain BTC data is presenting a contrasting story to price action. It is vital to understand the on-chain story to maintain a high level of conviction in BTC as an asset class. By understanding the structural health of the BTC blockchain, forecasts can be made about the future long-term macro moves in BTC's price.

Exchange Balances

One key fundamental metric which underpins the structure of the market is BTC Balances on Exchanges. Exchange Balances represent how much of the asset is held at trading venues as opposed to being in cold storage. When analysing exchange balances, Bitcoin is typically the most impactful to examine given its unique characteristics such as its fixed supply, as well as being the core asset underpinning the wider cryptocurrency market. High levels or an increase in exchange balances are indicative of higher speculation in the form of profit-taking and shorter time frame trading/ investing. Contrastingly, low levels or falling exchange balances indicates that participants have an increased time horizon of investment where they prefer the illiquidity as a trade-off for the security of their cold storage. This illiquidity means there is less BTC readily available to sell on exchanges and constricts supply. As liquid supply on exchanges falls, coupled with demand staying constant or rising, the BTC price should see an appreciation in the long term.

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Bitcoin: Balance on Exchanges [BTC] - All Exchanges



Figure 1: Bitcoin: Balance on Exchanges Aggregated, 2-year view – Glassnode

Figure 1 above shows the relationship between Exchange Balances and Price. Whilst balances have trended down overall since the Covid Crash in March 2020, it is worth highlighting the material uptrend in Exchange Balances between April 2021 and May 2021, which resulted in the large correction down to \$30k as short-term speculators got shaken out of the market. However, when looking at the recent pullback from Bitcoin's \$69k all-time high, there has been a continuous decline in exchange balances to make new lows. Could this perhaps signal an inherent structural difference compared to the previous drawdown, whereby a disparity widens between strong holders and weak holders? Given the combination between macroeconomic pressures and the net failure for BTC to arrive at exchanges, could this also signal significant seller exhaustion? We can consider these questions using further on-chain data with the goal of discerning the make-up of current BTC investors.

Dormancy Flow:

Dormancy Flow has become a larger talking point within the on-chain space due to its ability to act as a leading indicator, something which is often lacking in the data. Dormancy Flow represents the ratio between Market Capitalisation (\$) and Annualised Dormancy Value (\$). Annualised Dormancy Value can be described as the \$ sum of age-weighted spending. Put simply, when Dormancy Flow approaches extremely low levels indicated by the green box in Figure 2, it signals a reluctance by older coins to be spent/traded. Throughout Bitcoin's history, Dormancy Flow has only ever reached this level 4 times. Each occurrence

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culminated in a historic market bottom and a significant buying opportunity. When considering the current global macroeconomic uncertainty, Dormancy Flow signals that smart money in the form of old coins are extremely reluctant to distribute their holdings in this zone as doing so would be considered 'capitulation' according to this metric. When Dormancy Flow reaches this bottom zone, it typically reverses within a 4–6-week time span but can on occasion remain subdued for longer periods as seen during 2015. Currently, the metric has just trended out of the zone after 6 weeks but ideally, the PSG Cryptonomics Team need to see a full confirmation before classifying this as a reversal. This does not suggest price will make an immediate reversal, but rather it typifies the structure which underpins the fundamentals. This should eventually have an impact on price, but how long it takes remains to be seen.

Bitcoin: Entity-Adjusted Dormancy Flow (7d Moving Average)



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Figure 2: Bitcoin's Entity-Adjusted Dormancy Flow (7d Moving Average) – Glassnode

Supply Held by Long-Term vs. Short-Term Holders:

As the muted Dormancy Flow approaches an extreme zone known for high levels of conviction by "old" coins, it is relevant to examine whether this matches with the widening disparity between Long-Term (LTHs) and Short-Term Holders (STHs). LTHs, in this context, are defined by an entity that has held their coins for over 155 days. We find LTHs usually accumulate BTC in areas of weakness, whilst distributing in areas of strength. *Figure 3* shows the behaviour of LTH Supply against STH Supply across different price levels.

Firstly, tracking the macro behaviour of LTHs against STHs, there is clear directional accumulation by LTHs as the metric trends up. Contrastingly, STHs are essentially flat over

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the entire period, oscillating around a median cycle-by-cycle. Inferences can be made about this behaviour, but one cause of this could be a growth in the level of conviction by newer participants as they 'graduate' into LTH status. This signals healthy growth in conviction which ultimately supports an upwards trajectory on a macro scale. Furthermore, the LTH group can clearly be defined as "smart money" given their historical ability to distribute into strength and accumulate during periods of weakness. On the other hand, STHs tend to peak during macro tops and capitulate on the way down.

LTHs entering peak accumulation levels signals BTC's price is in an area of weakness. However, these levels are where smart money is entering the market at accelerating rates. Therefore, although we cannot expect any short-term price action because of this metric, we can understand the fundamental make-up of current BTC holders and their growing conviction in the face of macro uncertainty. Further to this, STHs are reaching historic lows signalling an overall reduction in the level of speculative participants currently holding BTC.

BTC: Long-Term Holder Supply, BTC: Short-Term Holder Supply, BTC: Price



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Figure 3: Bitcoin: Total Supply Held by Long-Term Holders vs. Total Supply Held by Short-Term Holders - Glassnode

Hash Rate:

When examining the health of the BTC network, the most important metric to analyse is the current Hash Rate. The Hash Rate refers to the overall computational power being used to mine blocks by processing transactions. It is vital to the health and security of the BTC network as higher levels of hashing power decrease the likelihood of attacks on the network, which requires most of the hash rate (>50%) to be controlled by malicious actors. As the hash rate grows, the expectation is that the network becomes more decentralised.

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Hashing power is impacted directly by mining difficulty. Mining difficulty increases as new miners join the BTC network, making mining more competitive. Hashing power will also change when technology is improved, as this also impacts miner competitiveness.

As shown in *Figure 4*, Hash Rate has been in a consistent uptrend, in line with expectations that as BTC matures as a network and asset class, there is likely to be a growing community of miners joining the network. However, in July 2021 China effectively banned BTC mining and this led to an almost 50% reduction in the Hash Rate. Many questioned how long it would take for this mining activity to be displaced to other parts of the world. In this case, it only took 6 months before hashing power was making new highs.

Although there has been a significant amount of speculation, the relationship between the hash rate and price is not as clear-cut as most expect. There are disagreements in the literature surrounding how best to analyse this relationship based upon rigorous investigation. Some models suggest that hash rate is directly impacted by BTC's price, but this relationship only works in one direction. Other publications suggest the positive relationship may be overstated due to autocorrelation and endogeneity. In any case, given that we know BTC's price does have a statistically significant impact on hashing power according to some literature, it should instil confidence in investors that even though BTC is currently in a downtrend, the network has never been more secure. As was seen in the rapid recovery of hashing power following the Chinese crackdown, the network is expected to remain resilient by design due to its decentralised nature and the will of participants to support the network through mining regardless of short-term price speculation.

Bitcoin: Mean Hash Rate (7d Moving Average)



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Figure 4: BTC Mean Hash Rate (7d MA) - Glassnode

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To conclude, the on-chain data paints a picture of strong fundamentals underpinning the structure of BTC as an asset. Most short-term holders have already capitulated, and we are currently sitting within an accumulation phase. This is supported by decreasing Exchange Balances, LTH supply growth and the Dormancy Flow reaching extremely low levels. The stark correlation across global markets is clearly a driving force for all price action. Until the macroeconomic uncertainty abates, the correlation will continue to drive speculative markets. As the correlation levels off, fundamentals will begin to drive price action to a larger extent. As the on-chain data suggests, Bitcoin is a fundamentally bullish asset across a lengthy time horizon, but participants must let the data and fundamental divergences ultimately play out. Using these metrics cannot provide a quick view into short-term price action, but it does approach the market from a "health" perspective which ultimately is one of the key drivers of price over the long-term.

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