



# The Weekly Hash, 12/22/21

## Target Hashrate Likely to End 2021 at 170EH/s; Hash Spreads Tighten; CME Open Interest Dips 3% WoW

**Bitcoin rose 1.6% week-on-week (WoW), settling at \$49,082 as of midnight UTC on 12/21.** Several BTC miners have outperformed BTC YTD, notably Mawson and Marathon, but most have underperformed over the past week

The ProShares BITO ETF trails BTC by 2.6% since fund inception; the fund launch correlates strongly with increased CME open interest, as AUM increased rapidly in the first week from launch.

The CME Futures curve has flattened at the front end, inside the liquidity window. Current open interest fell 3% WoW to 12,852 lots. The Commitment of Traders data from 12/14 shows that spreading positions increased, while commercial players reduced their longs. The non-commercial player net length on the CME is now short 257 lots, compared with short 117 lots the week prior and short 729 lots (the YTD minimum) just before Thanksgiving (11/23).

**Total BTC earnings per PH/s are ~5.26 mBTC, near identical to last week's on a minor reduction in transaction fees** (1mBTC or milliBTC = 1/1000 BTC). Transaction fees fell 7 bps WoW to 1.2% of miner rewards, or 0.07 BTC per block. The "Mempool" shows low congestion levels, with 5,130 pending transactions. We continue to assess congestion will likely stay low for awhile with the falloff of trading activity in Asia, where a higher percentage of on-exchange transactions result in on-chain transactions,

as well as increasing Layer 2 adoption, such as the Lightning Network.

**Bitcoin mining revenue gained to \$258 / PH/s per day and \$282/MWh.** Miner economics are on track to come in modestly better than our previous year-end estimate. The current block rate suggests that the actual year-end target Hashrate will likely be around 170 EH/s, short of our prior 198EH/s forecast.

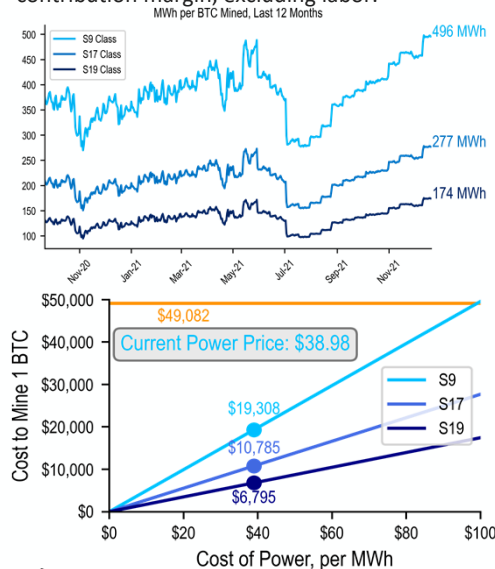
**The BitOoda North American Hash Spread™ fell 1.3% from \$245 to \$243.** We define the BitOoda Hash Spread™ as the difference between the cost of power per MWh and the Bitcoin mining revenue per MWh. This gives miners a quick sense of the surplus generated by their business to cover personnel, overhead, depreciation, and profit. The weighted average around the clock U.S. wholesale industrial power price (5 markets) of \$38.98 / MWh leads to an aggregate spread of \$243.

	S9 Class	S17 Class	S19 Class
Hash Spread	\$60	\$138	\$243
Week on Week	-9.2%	-3.4%	-1.3%

Older-gen S9-class devices saw their Hash Spread™ down ~9% to \$60/MWh. S17-class devices, the bulk of the installed base, saw a hash spread of about \$138/ MWh.

**It now takes 174 MWh to mine 1 BTC using S19-class rigs,** while S17-class machines would consume 277 MWh, and S9-class, 496

MWh. This translates into \$6,795 in power expense to mine 1 BTC with S19 class rigs, and \$19,308 using S9 rigs, a ~61% contribution margin, excluding labor.



### Takeaways

- Mining margins are attractive, but are mean reverting, down to the 60<sup>th</sup> percentile of 3-year history
- Hashrate is likely ~20EH/s or 10% short of our year-end estimate, helping maintain margins despite price declines.
- However, most miners continue to underperform Bitcoin
- CME Futures net length fell to short 257 lots, from short 117 lots last week

## Research

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BTC Price \$49,140  
 (12/22 at 10am EDT)

Obs. Hashrate 184 EH/s

### Bitcoin Miners 7 Day Performance

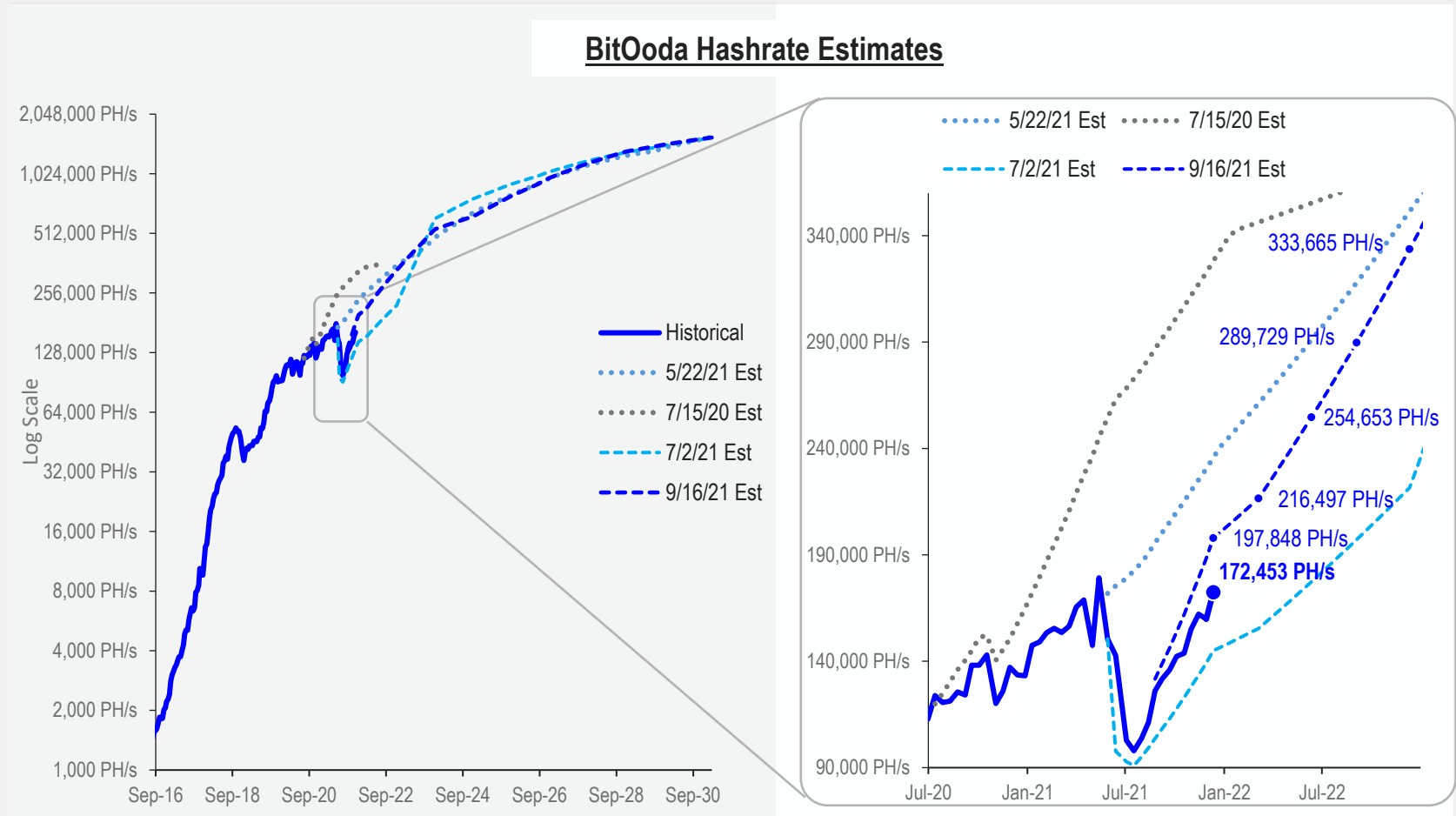
Iris Energy	29.5%
Digihost	9.4%
Hive	1.8%
Northern Data	-0.8%
Bitcoin	-0.8%
S&P	-1.2%
Bitfarms	-2.0%
Greenidge	-2.7%
Cathedra	-3.4%
Argo	-4.0%
Riot	-5.1%
Hut8	-5.3%
Cipher	-7.4%
Canaan	-7.7%
Mawson	-8.1%
Bit Digital	-8.2%
Marathon	-10.5%
Ebang	-18.7%
Stronghold	-31.9%
Terawulf	-38.8%



# BitOoda 2021 Hash Estimates

## ~170 EH/s by Year End Likely

- On September 16, we estimated a ~198EH/s year end (YE) 2021 target Hashrate
- Since then, target Hashrate continues to recover, although it is slightly lower than we had expected at this point and currently stands at 172.5 EH/s
- With just one reset left this year and block count about 28 below expectations at this point in the epoch, the next difficulty reset may end up being negative
- Thus, miner profitability may modestly exceed our expectations over the next few months



**Figure:** Historical and Estimated Target Hashrate 2017-2030  
 Historical as of 12/11/21; Estimates as of 9/16/21, 7/2/21, 5/22/21, and 7/15/20

Source: BitOoda estimates, CoinMetrics

# Bitcoin Miners: Performance Map

- Most public Bitcoin miners have underperformed the asset over the past month, seven days and MTD / QTD
- On a YTD basis, several have outperformed BTC, including Mawson (MIGI) and Marathon (MARA)



Year to Date	Quarter to Date	Month to Date	30 Day	7 Day	1 Day
					Northern Data, 5.1%
					Bitfarms, 4.2%
					Cathedra, 4.2%
					Digihost, 3.7%
					Ebang, 3.2%
					Hive, 2.5%
					Riot, 2.1%
					Argo, 1.5%
				Iris Energy, 29.5%	Marathon, 0.7%
				Digihost, 9.4%	Stronghold, 0.1%
				Hive, 1.8%	S&P, 0.1%
Mawson, 241.2%					
Marathon, 232.1%					
Hut8, 197.3%					
Bitfarms, 168.7%		S&P, 1.9%			
Cathedra, 132.0%		Iris Energy, (1.7%)			
Digihost, 90.5%	Bitfarms, 20.1%	Greenidge, (13.3%)	S&P, (0.6%)	Northern Data, (0.8%)	Hut8, (0.0%)
Bitcoin, 66.8%	Bitcoin, 12.3%	Bitcoin, (14.6%)	Bitcoin, (13.3%)	Bitcoin, (0.8%)	Bitcoin, (0.7%)
Hive, 52.4%	Marathon, 9.8%	Digihost, (18.5%)	Greenidge, (13.5%)	S&P, (1.2%)	Iris Energy, (0.7%)
Riot, 44.6%	S&P, 8.0%	Hive, (23.6%)	Northern Data, (14.6%)	Bitfarms, (2.0%)	Canaan, (1.6%)
S&P, 23.9%	Hive, 7.9%	Cathedra, (24.0%)	Digihost, (16.2%)	Greenidge, (2.7%)	Cipher, (1.8%)
Terawulf, 19.9%	Northern Data, 6.4%	Ebang, (24.2%)	Iris Energy, (21.2%)	Cathedra, (3.4%)	Bit Digital, (2.5%)
Northern Data, (3.6%)	Digihost, 4.2%	Northern Data, (26.4%)	Cathedra, (22.6%)	Argo, (4.0%)	Terawulf, (3.7%)
Canaan, (14.4%)	Cathedra, 2.2%	Mawson, (28.4%)	Hive, (26.0%)	Riot, (5.1%)	Greenidge, (3.8%)
Cipher, (52.0%)	Hut8, (2.7%)	Argo, (30.5%)	Riot, (26.6%)	Hut8, (5.3%)	Mawson, (5.2%)
Bit Digital, (69.4%)	Riot, (4.4%)	Bit Digital, (31.9%)	Argo, (27.1%)	Cipher, (7.4%)	
Ebang, (81.6%)	Bit Digital, (7.3%)	Marathon, (32.1%)	Marathon, (30.0%)	Canaan, (7.7%)	
,	Canaan, (16.9%)	Hut8, (32.1%)	Bit Digital, (30.1%)	Mawson, (8.1%)	
,	Argo, (21.6%)	Bitfarms, (33.3%)	Ebang, (31.2%)	Bit Digital, (8.2%)	
,	Mawson, (28.4%)	Riot, (34.3%)	Bitfarms, (31.4%)	Marathon, (10.5%)	
,	Greenidge, (34.2%)	Stronghold, (35.9%)	Mawson, (32.3%)	Ebang, (18.7%)	
	Ebang, (41.4%)	Cipher, (39.4%)	Hut8, (34.1%)	Stronghold, (31.9%)	
	Cipher, (53.8%)	Canaan, (42.2%)	Cipher, (42.3%)	Terawulf, (38.8%)	
	Terawulf, (57.9%)	Terawulf, (64.3%)	Canaan, (43.3%)		
	,		Stronghold, (48.1%)		
	,		Terawulf, (71.4%)		

Source: Bloomberg

# Futures Curve Front End Flat

## Open Interest Dipped 3% WoW

- The futures curve is essentially flat through March, with slight backwardation for the active contract.
- Liquidity is limited to the front two months, and dries up rapidly thereafter
- CME open interest fell 3% vs. both last week and two weeks ago to 12,852 lots
- Open interest for December is beginning to come down, while January and February are both ticking up
- With the impending roll heading into option expiry, December OI fell almost 1500 lots

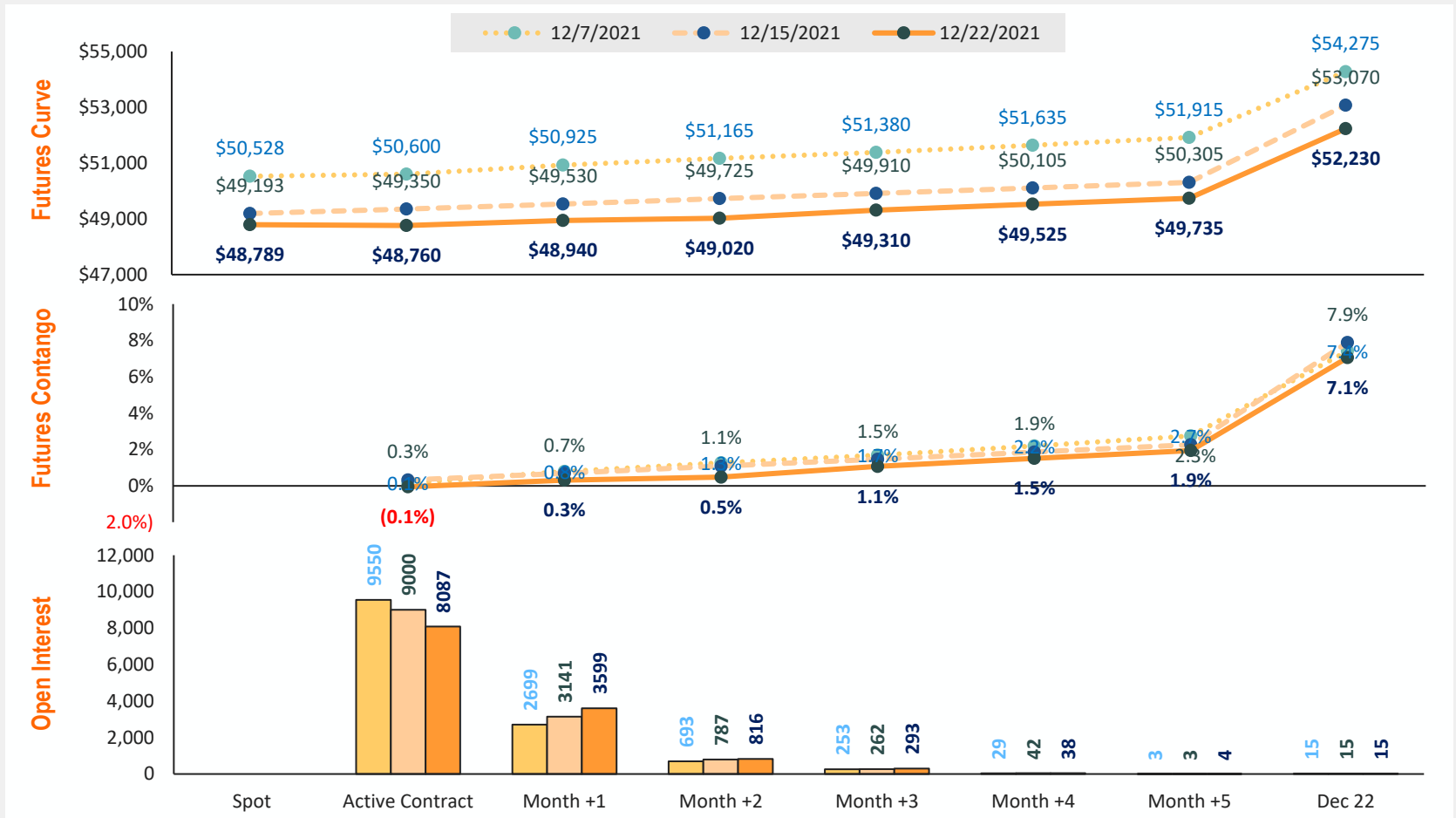


Figure: Bitcoin futures metrics

Source: CME, Bloomberg



# CME YTD Open Interest Trending Down in December

- CME Bitcoin Futures open interest increased significantly ahead of the launch of the Bitcoin Futures ETFs
- It fell back after the October expiry, and climbed through most of November
- OI has been trending modestly down in December

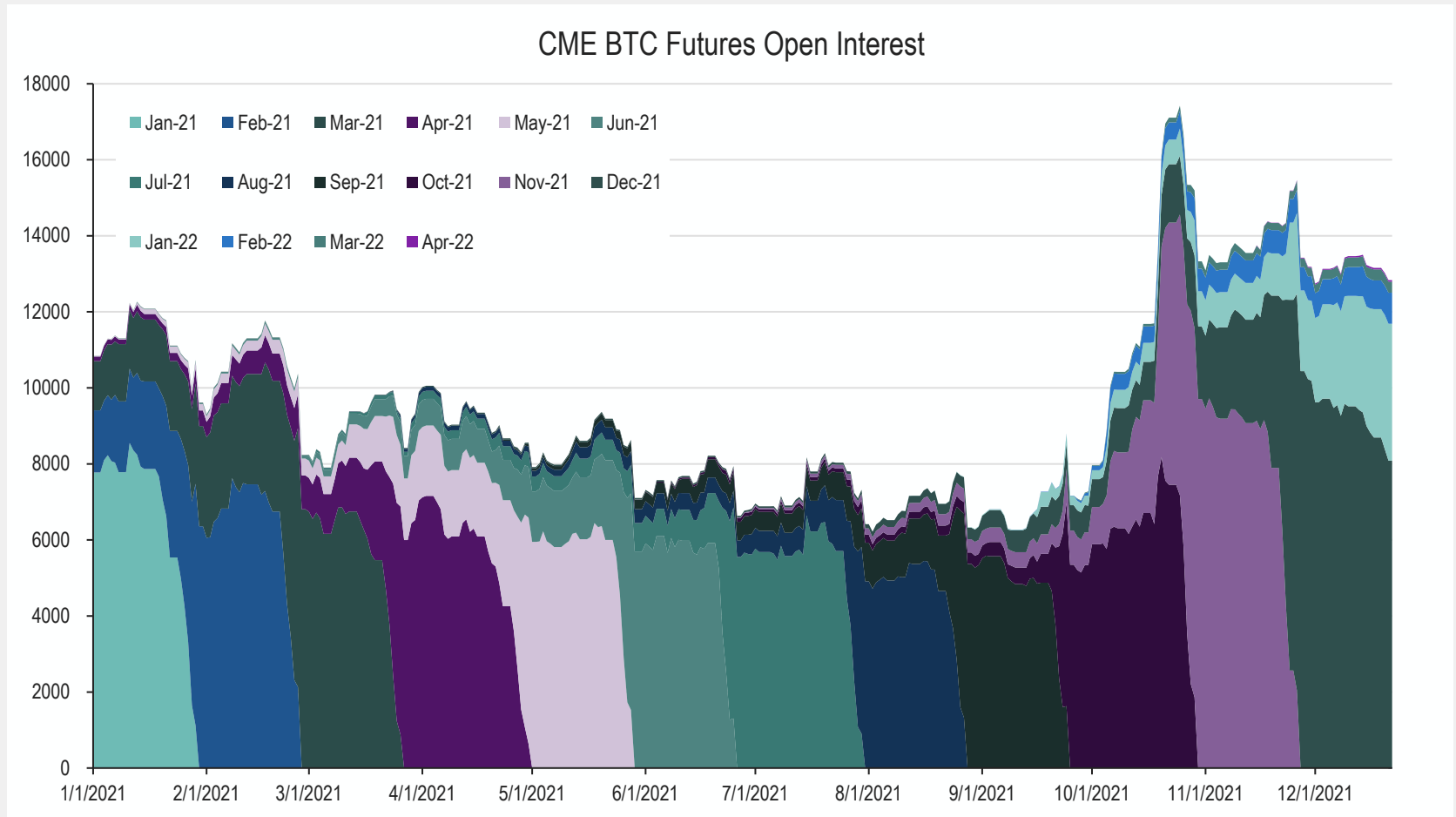


Figure: CME BTC Futures Open Interest history

Source: Bloomberg



# ProShares Futures ETF BITO Slightly Below BTC

- The ProShares ETF BITO currently has a market cap of \$1.2 billion
- The ETF has underperformed Bitcoin by 2.6%, declining by 26.5% since launch vs. a 23.9% decline in the price of BTC in the same timeframe

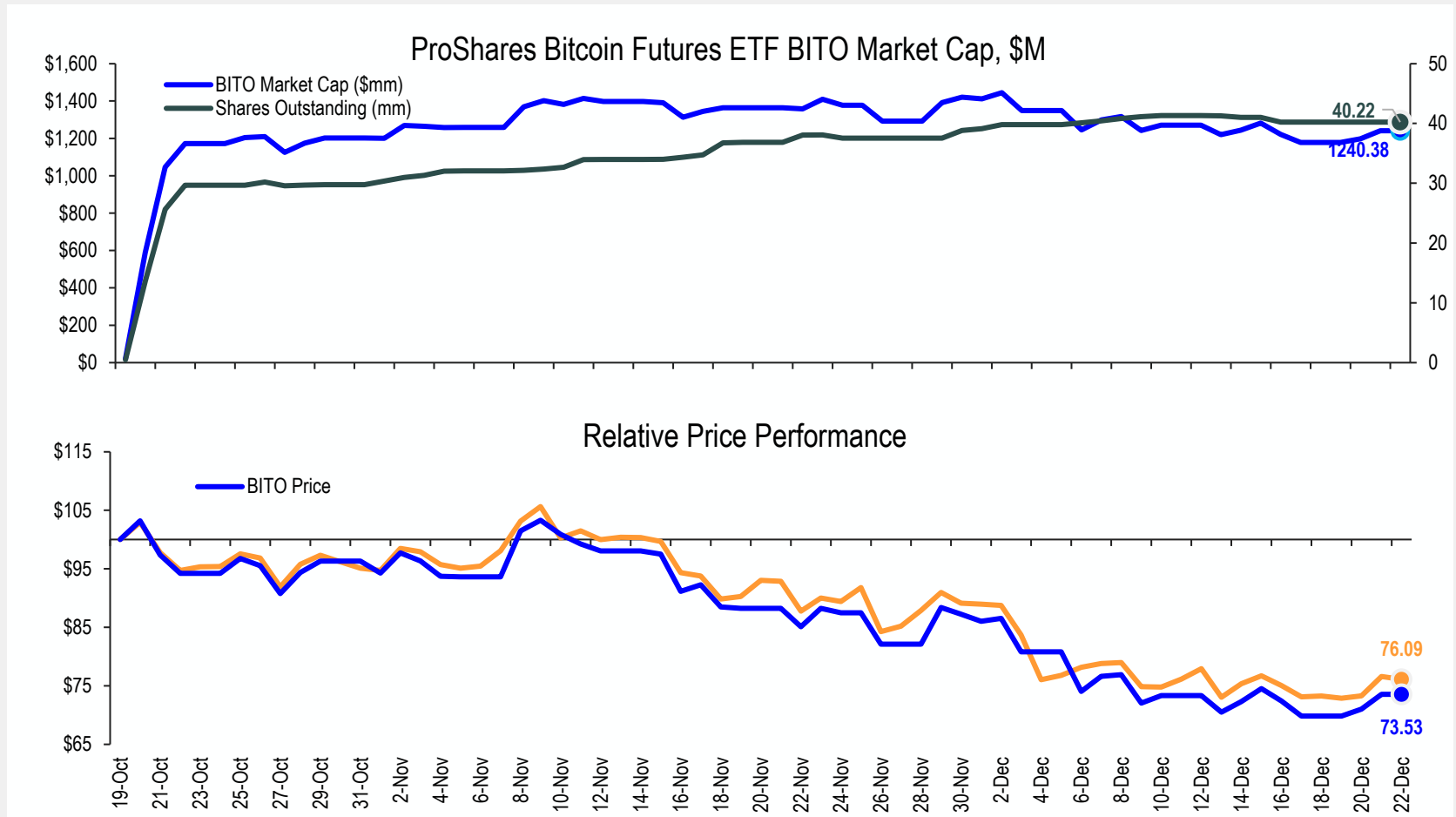


Figure: ProShares Bitcoin Strategy Futures ETF market cap and price performance compared to Bitcoin

Source: Bloomberg

# CME Commitment of Traders 12/14 Open Interest Climbed on Spreading Position Growth

- The CME Bitcoin Commitment of Traders report shows that open interest increased slightly to 12/14
- Data shows 13,518 lots on 12/14, compared with 13,242 on 12/7/21
- Spreading positions increased
- Leveraged players reduced their net short positions, while Other Reportable and Non-Reportable players increased net short positions

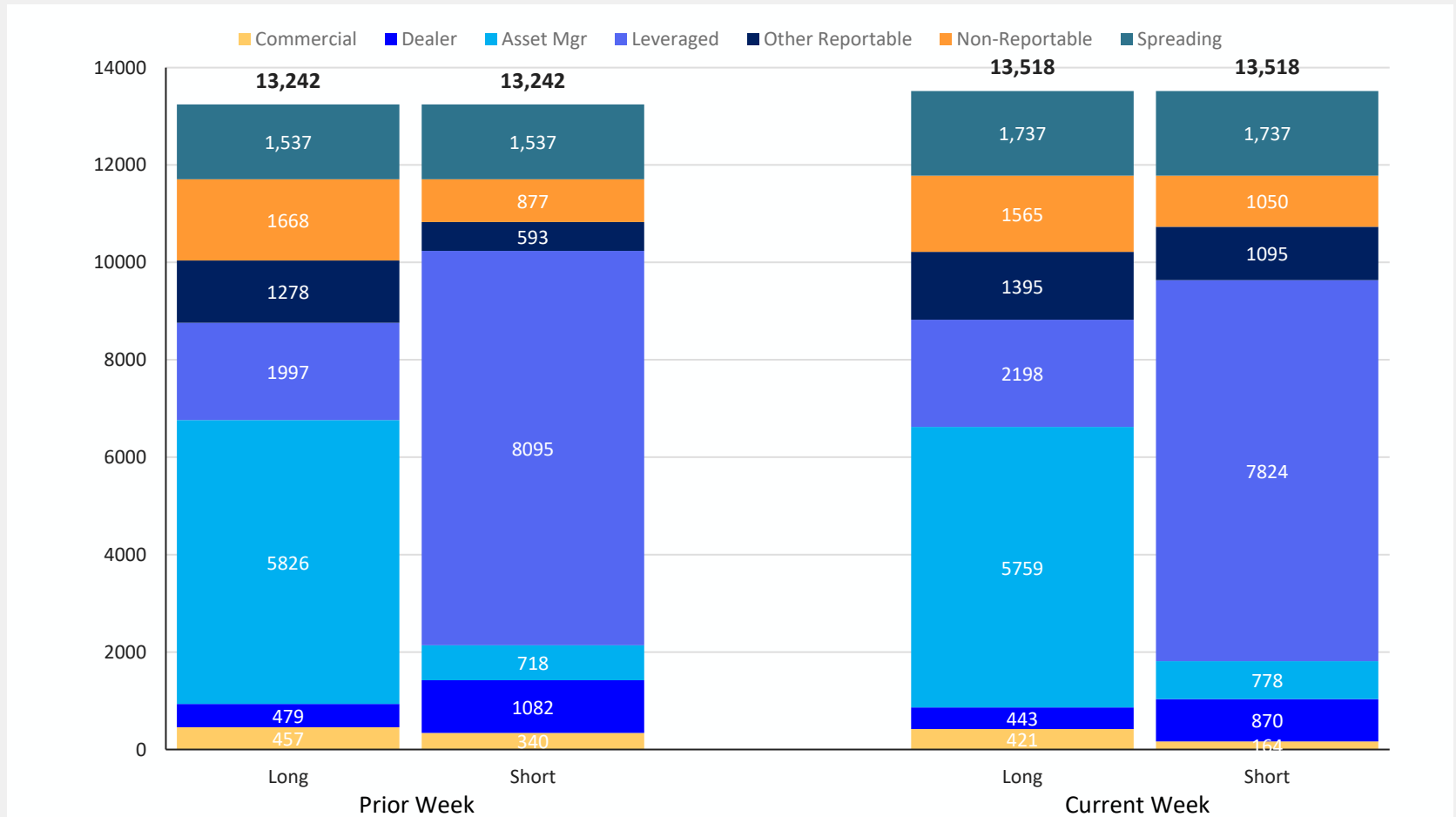


Figure: CME Bitcoin Commitment of Traders, 12/14/2021 and 12/7/21

Source: Bloomberg



# Non-Commercial Net Length Short 257 Lots

- Commercial Bitcoin players are not very active in the options space, participating mainly in the futures arena
- Commercial positioning has been largely long futures
- As a result, the net position for non-commercial market participants has been largely short
- The net length for non-commercial participants is now short 257, an increase in the short position from 117 lots a week prior



Figure: CME Bitcoin Future Non-Commercial Net Length, YTD

Source: Bloomberg



# BitOoda Hash™ Dashboard

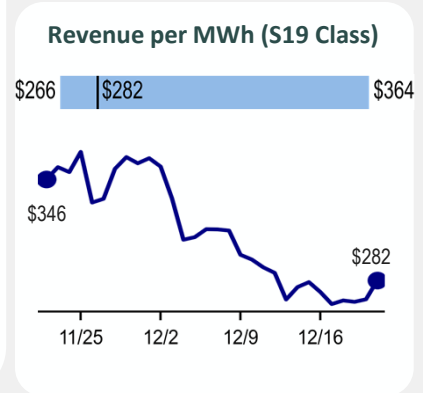
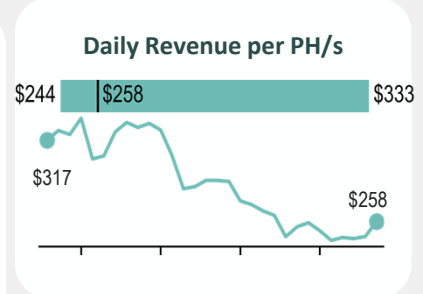
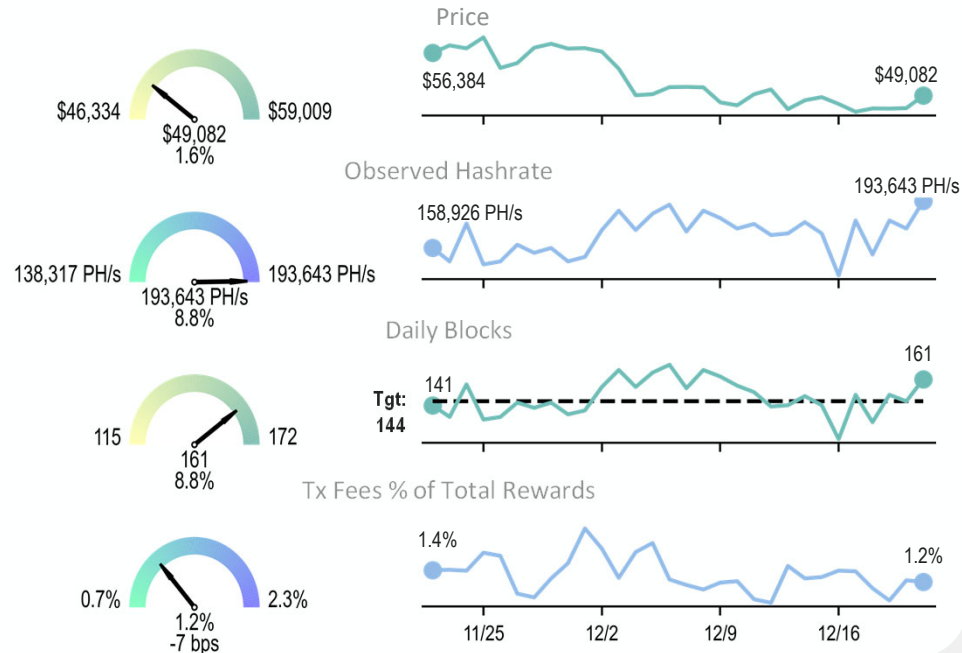
December 22, 2021

### Definitions

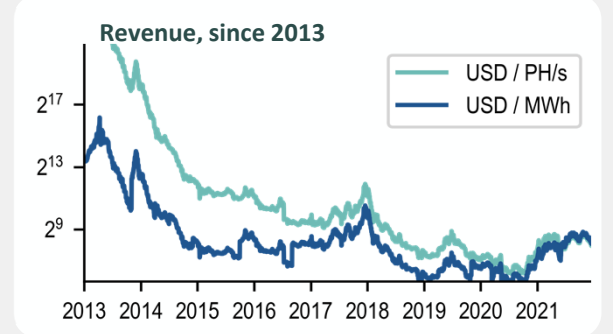
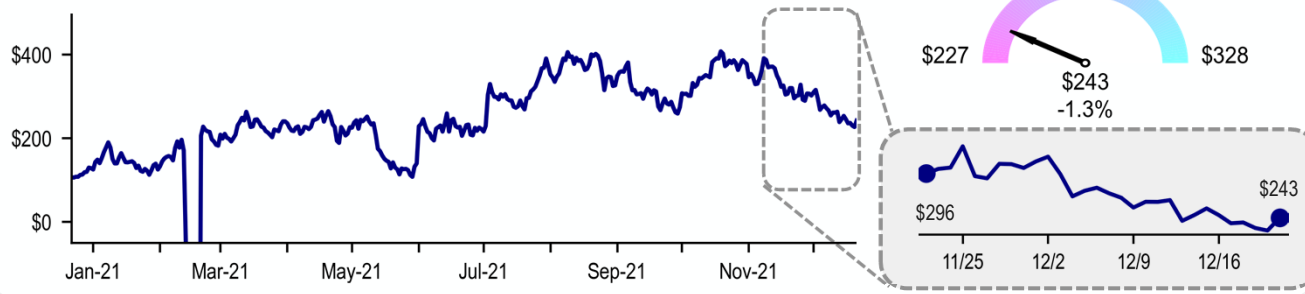
**Hash Spread:** the difference between the revenue per MWh from mining BTC and the weighted average cost of peak and off-peak power across 8 US zones. It is a quick measure of the profitability of US-based latest-generation mining rigs.

**MWh:** Megawatt hour  
**PH/s:** Petahash per second  
**Tx Fees:** Fees for BTC transactions

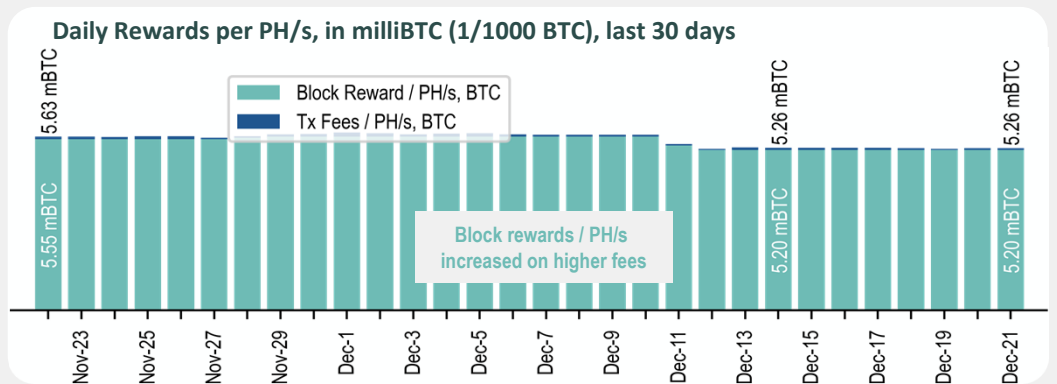
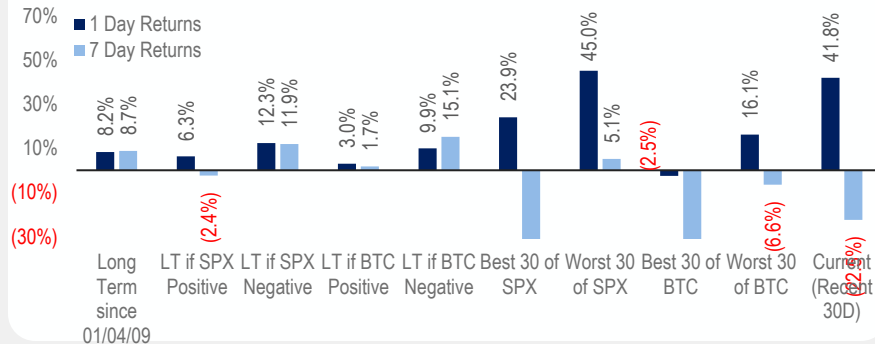
### 30 Day Range and 7-day % change



### BitOoda North American Hash Spread™



### Historical BTC Correlation to S&P500





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