



Bitcoin and the Public Markets

\$52mm in Weekly Fund Outflows; BTC Outperforming as Risk Off Trade Wanes

The correlation of Bitcoin to the Nasdaq is ~57%, climbing over the past week. As we noted last week, the Russian invasion of Ukraine led to a large sell off that reversed faster than we expected. We continue to see sustained follow through on the reversal three days later. Subsequently, while Wheat continues to outperform on macro fundamentals (both Ukraine and Russia are large wheat exporters), many of the other macro indicators have mean reverted (slide 3). While the VIX remains elevated, it has fallen back from levels seen on Thursday.

Markets expect volatility to continue to decline – realized volatility increased from 64% last week to 71% today, while 30-day at the money implied volatility only ticked up to 56.8% from 56.3% last week (slide 4). Realized volatility is currently 14.4% points above implied volatility; realized vol is only occasionally (and briefly) higher than implied. While we expect these occasional inversions to occur in the depths of a selloff, the disconnect between a somewhat illiquid, regulated US institutional asset (CME Futures) and a global, liquid, largely retail-driven asset (Bitcoin) suggests these inversions are reactive in nature rather than, as yet, predictive of price turning points.

The 18 publicly listed mining stocks trade at an average adjusted Enterprise Value per YE 2022 PH/s of planned capacity of

\$140k, up \$10k since last week. Adjusted EV = Market Cap + Debt – Cash – Market Value of Crypto Holdings. Technically, pending capital expenditures needed to pay for future deliveries of announced rig purchases and ancillary equipment should be added back, but the lack of data led us to exclude this adjustment for consistency.

Notably, miners like Hive that have relatively modest expansion plans, or Riot that have low power and operating costs, trade at a premium to the group. We also examined financials based on Bloomberg analyst consensus, finding that the companies that do have estimates trade at 3.5x 2022E EBITDA and 7.6x 2022E Contribution (Gross Profit + Depreciation). Considering our 327EH/s year end network Hashrate estimate, we suspect that consensus EBITDA estimates may need downward revisions unless Bitcoin price accelerates to new highs. The multiples now look reasonably accommodative of a downward EBITDA recalibration.

Our institutional fund flow section covers 19 funds with \$26B of AUM (up \$3B Week on Week). GBTC, an ETP, is 75%+ of the group, and has seen no inflows recently. The others are mostly crypto-exposed equity ETFs with a broader innovation focus – ProShares BITO Bitcoin futures fund excepted.

Over the past week, funds have seen a

\$52mm in net redemptions (slide 21). BITO saw a \$41mm redemption on 2/24 alone, in line with the broader risk off markets following the Russian invasion. Year-to-date, overall outflows across the selected funds we track were \$261mm (slide 23).

Key Takeaways

- Bitcoin's correlation to the Nasdaq increased to 57%; the relationship is strongest when the Nasdaq is down a lot
- Overall, we are seeing sustained a reversal of the risk off trade last week following the invasion of Ukraine
- Implied volatility (100% moneyness for the active contract) is now 14.4% below realized 30-day volatility, although we do not view it as predictive of price turning points
- On our preferred adjusted EV per PH/s metric, the miners trade at an average of \$140k, up \$10k from last week
- Our YE network Hashrate estimate of 327 EH/s implies that either BTC price needs to accelerate, or that consensus EBITDA estimates need to be recalibrated down – but a modest 3.5x Adj EV / EBITDA multiple should be accommodative
- Over the past week, funds have seen \$52mm in outflows, taking YTD outflows to \$261mm year-to-date, led largely by ARKW (outflows of \$3.1B over 12 months / \$360mm YTD)

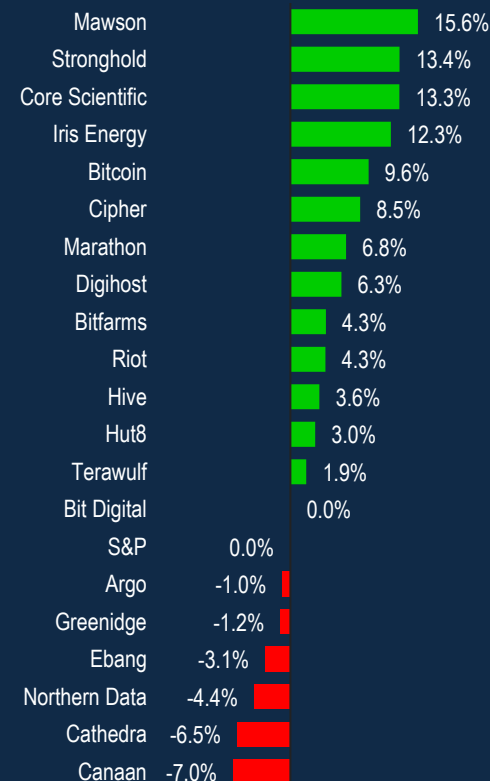
Research

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BTC Price (2/28 at 2pm ET) \$41,201

Obs Hashrate 225 EH/s

7 Day Performance





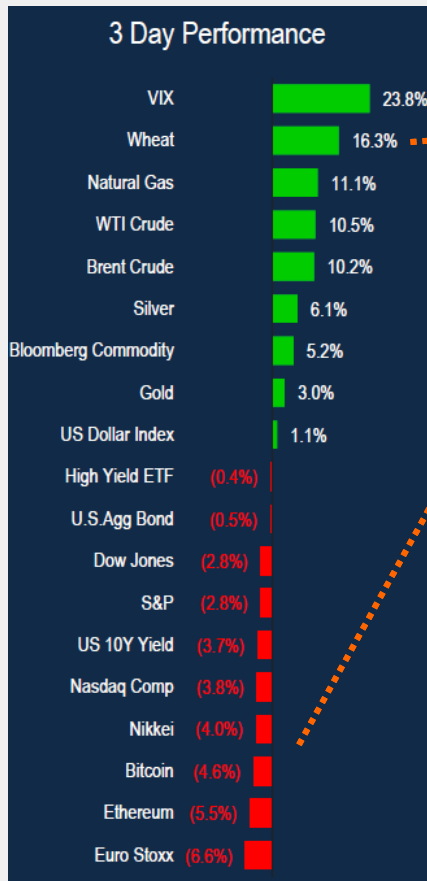
Bitcoin and Broader Markets

Macro Markets

Bitcoin is Recovering With a Falling VIX

- The VIX is falling back after the initial Ukraine shock: it is now up 9.7% vs. a week ago, compared to a 24% 3-day jump as of 2/23
- At the same time, Wheat appears to have sustained the rise, falling back to up 10.9% vs. up 16.3% initially.
- Most other indicators have reversed course: Bitcoin and Ethereum are up meaningfully, and most equity markets have recovered at least partially, while gold and commodities gave back their gains

3D Performance as of 2/23



7D Performance as of 2/28

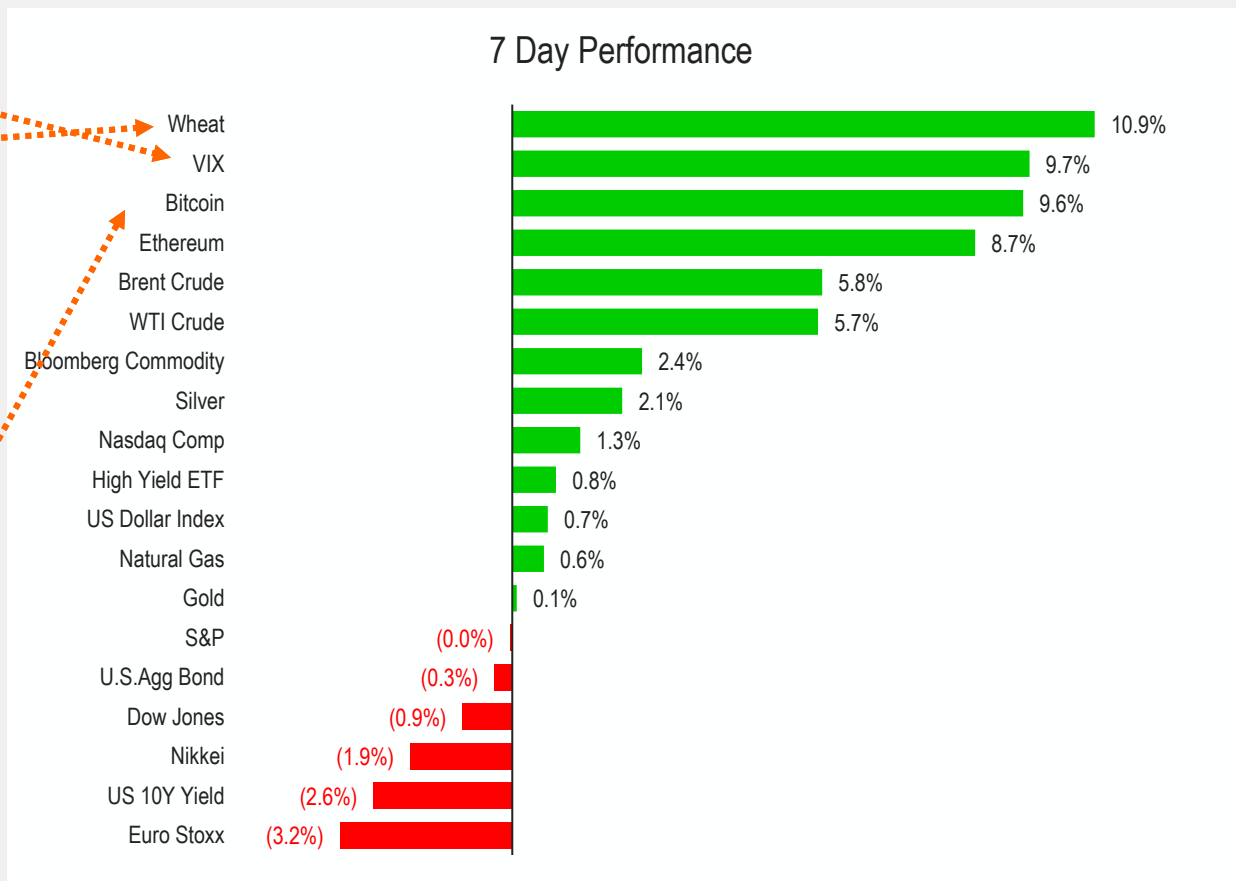


Figure: Macro Indicators: Returns over 7 days, and 3 day returns as of 2/23

Source: BitOoda, Bloomberg

Realized Bitcoin Volatility 14% Above Implied

- Realized Bitcoin volatility (30-day annualized) consistently comes in under 100% moneyness implied vol for the generic 1st CME contract
- However, this recently flipped to realized exceeding implied volatility
- Overall, both volatilities came down WoW
- Currently, 100% moneyness implied volatility is 56.75% (vs. 56.3% week ago), compared with 71.1% (63.85% week ago) for realized volatility
- Realized volatility is 14.4% points above implied volatility, vs. 7.5% above last week

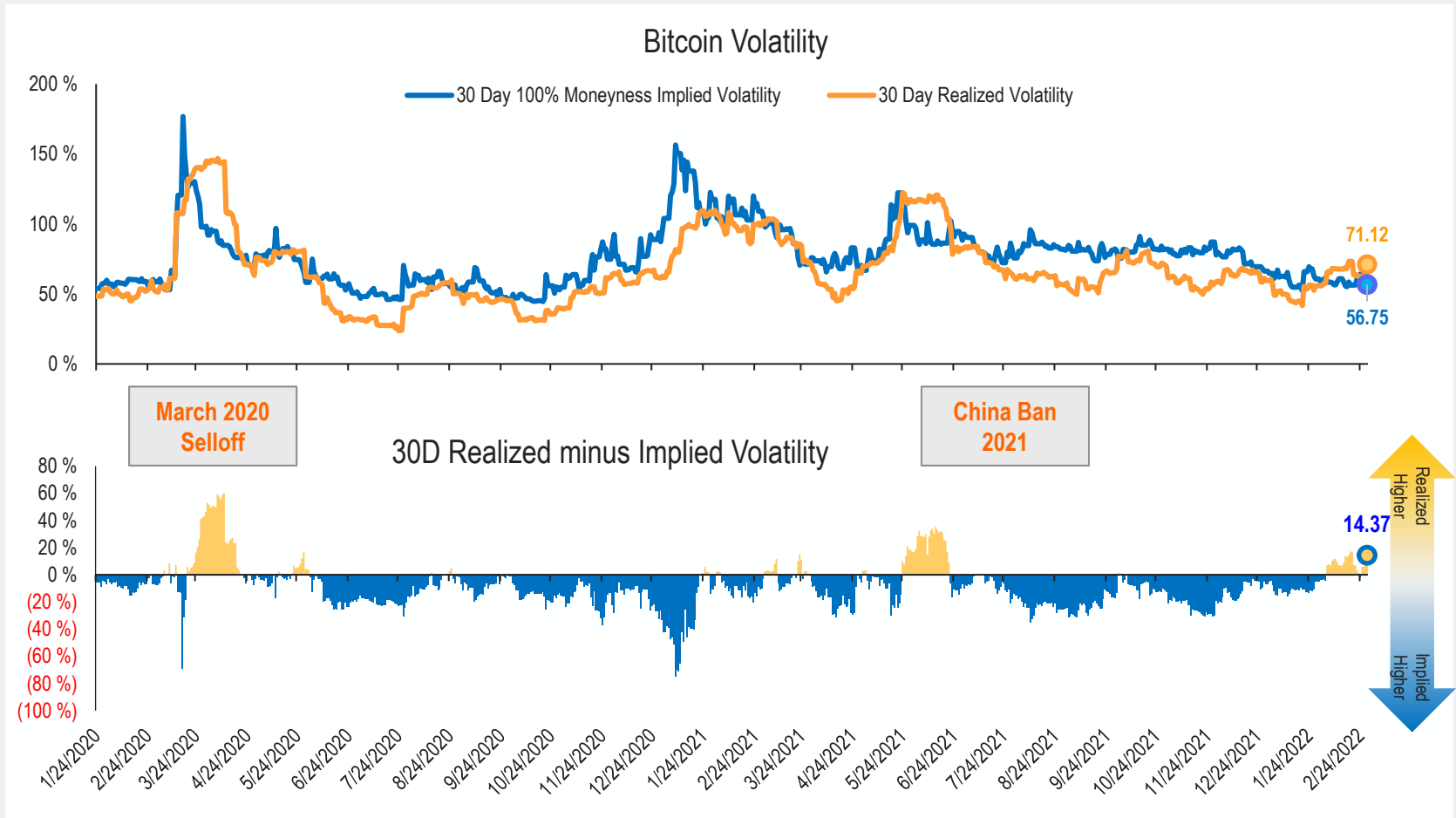


Figure: Trailing 2-year Bitcoin annualized volatility based on 30-day trailing daily returns of XBTUSD Curncy and 100% Moneyness Implied Volatility for BTC1 Curncy

Source: Bloomberg, BitOoda

When the Nasdaq Sneezes Bitcoin Catches a Cold

- As shown below, when the Nasdaq performance is in the bottom quartile of its range (since BTC's peak), Bitcoin's return is usually also in the bottom quartile
- This relationship holds in the second quartile of Nasdaq performance as well
- However, the relationship is much weaker when the Nasdaq is doing well
- Later in this report, we also show performance by decile since 1/1/2020

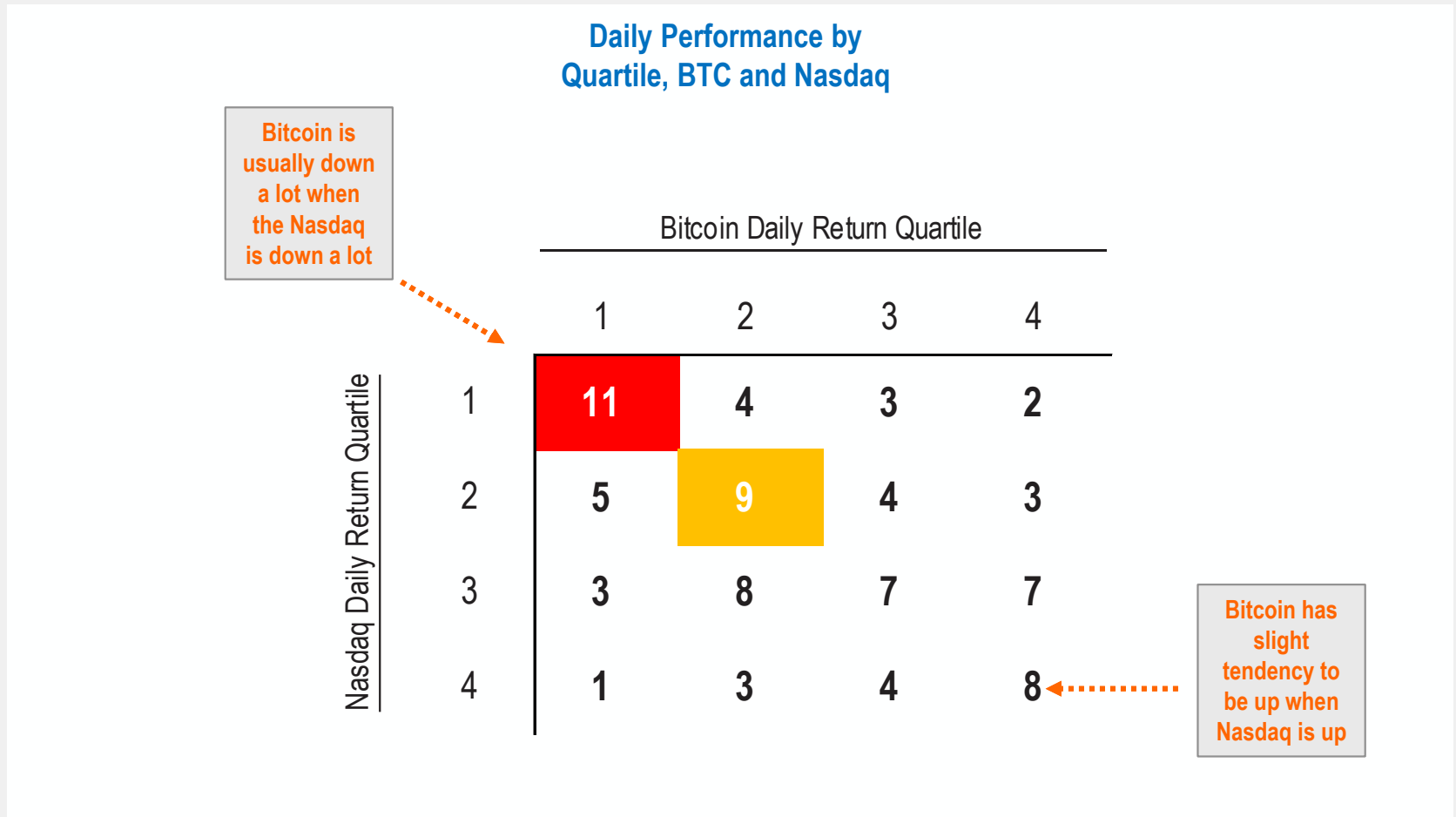


Figure: Sample count of daily returns by quartile, Bitcoin and Nasdaq Note Since 11/10/21

Source: BitOoda, Bloomberg

57% BTC / Nasdaq Correlation Stronger when Nasdaq Weak

- The scatter plot below shows the daily performance of Bitcoin against the Nasdaq, grouped by quartile of Nasdaq returns, since BTC's peak on 11/10/21
- We see that Bitcoin returns cluster on the negative side when the Nasdaq is weakest
- Further, the worst daily returns coincide with some of the worst Nasdaq returns

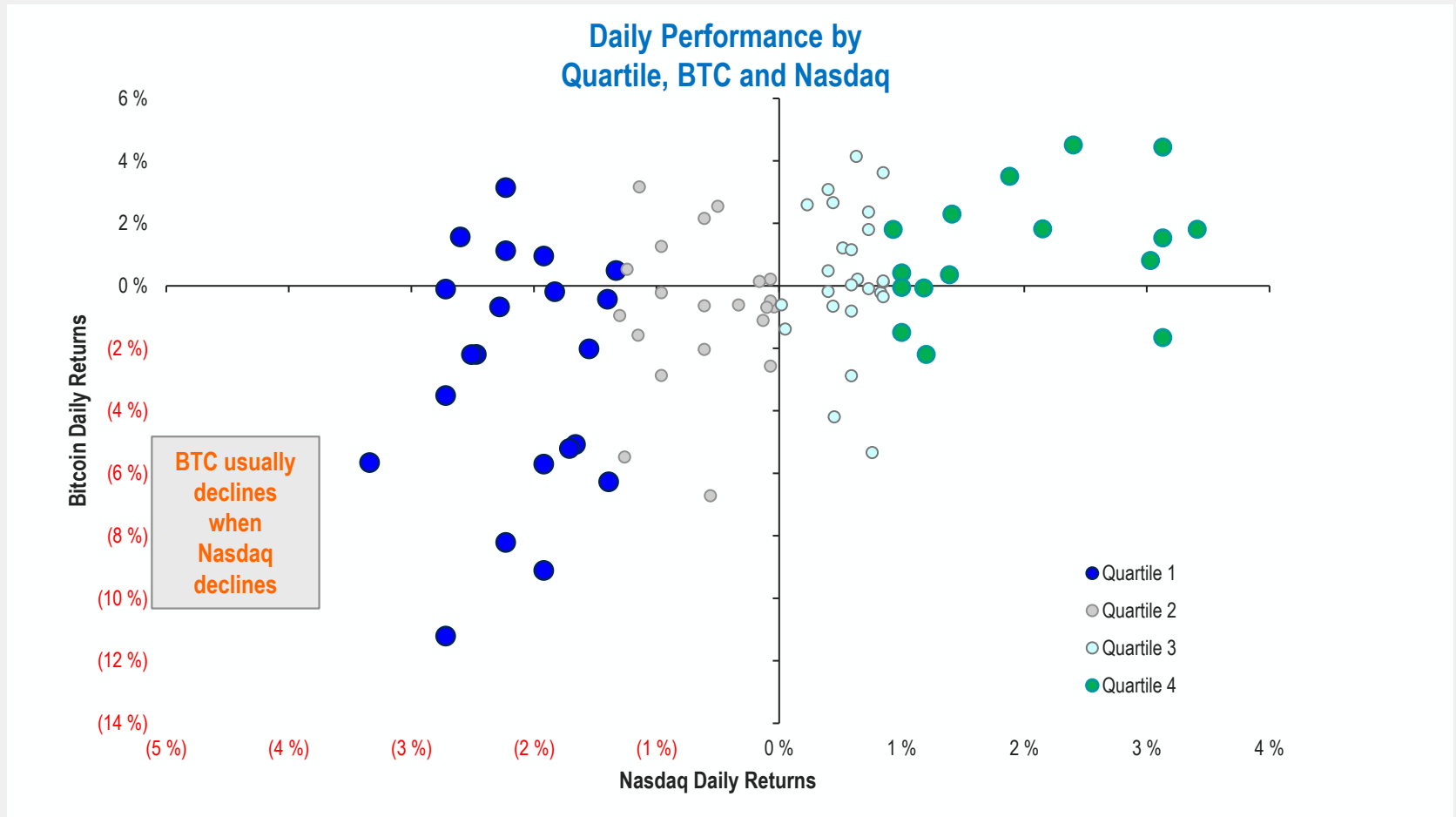


Figure: Bitcoin miner drawdowns
Note Lowest quartile is weakest 25% of daily returns

Source: BitOoda, Bloomberg



Worst Decile of BTC Returns Most Likely When Nasdaq Weakest

- BTC is likely to perform poorly when the Nasdaq is underperforming, based on performance data since Jan 2020
- With the larger sample size, we looked at deciles of daily returns for both Bitcoin and the Nasdaq
- The single largest sample frequency is when both Bitcoin and the Nasdaq have returns in the bottom decile – 19 instances
- This relationship holds in the top decile of Nasdaq performance as well

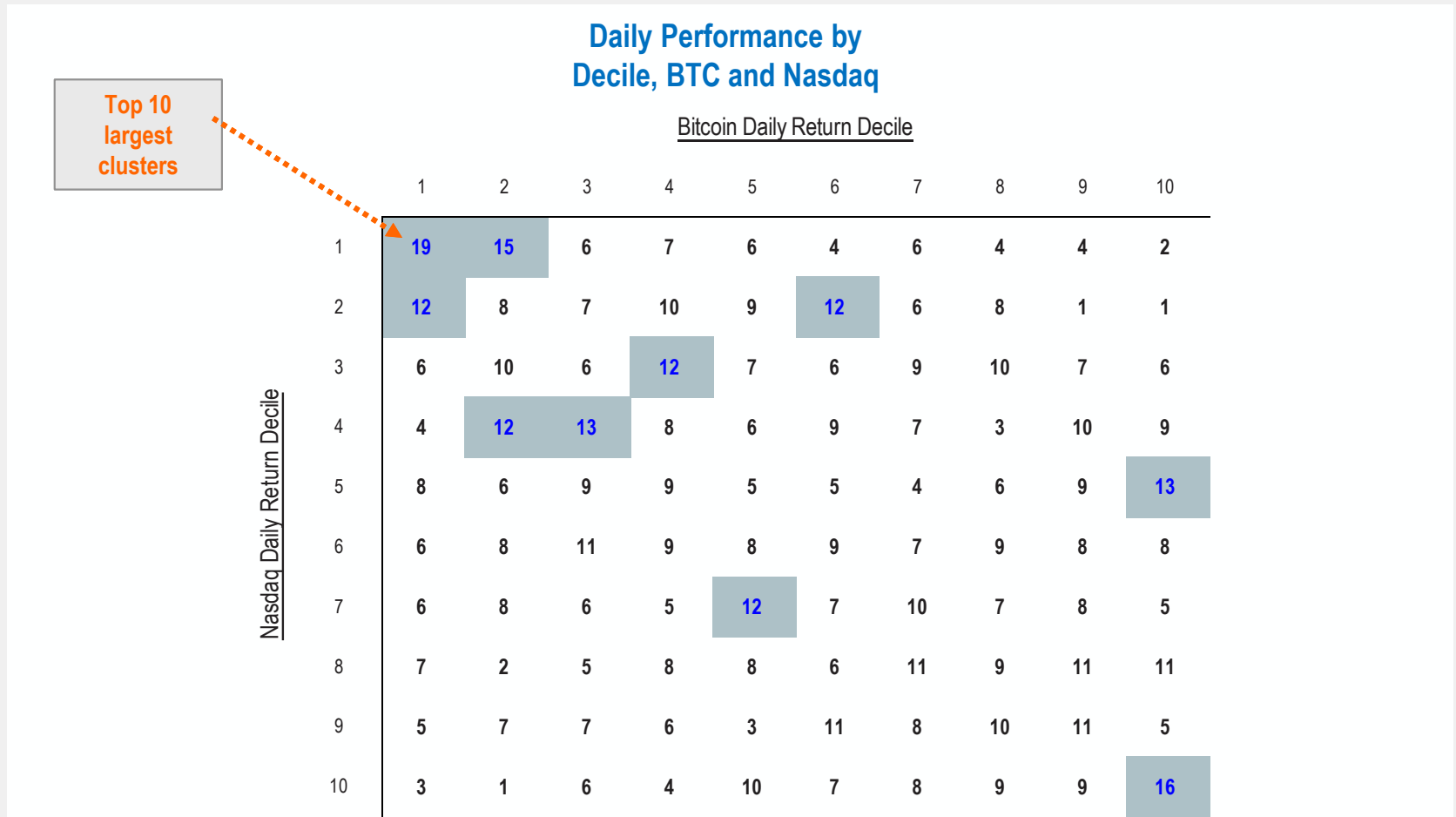


Figure: Sample count of daily returns by quartile, Bitcoin and Nasdaq Note Since 1/1/20

Source: BitOoda, Bloomberg

Long Term BTC / Nasdaq Correlation

- The scatter plot below shows the daily performance of Bitcoin against the Nasdaq, grouped by the top / bottom decile of Nasdaq returns, since 1/1/2020
- We see that Bitcoin returns cluster on the negative side when the Nasdaq is weakest
- Equally, there is a visible relationship when the Nasdaq is strongly positive
- Further, the worst daily returns coincide with some of the worst Nasdaq returns
- The overall correlation is close to zero ($R^2 = 0.08$), making Bitcoin an “uncorrelated asset”, but the relationship is stronger at the extremes – so it is correlated when investors need it to be uncorrelated

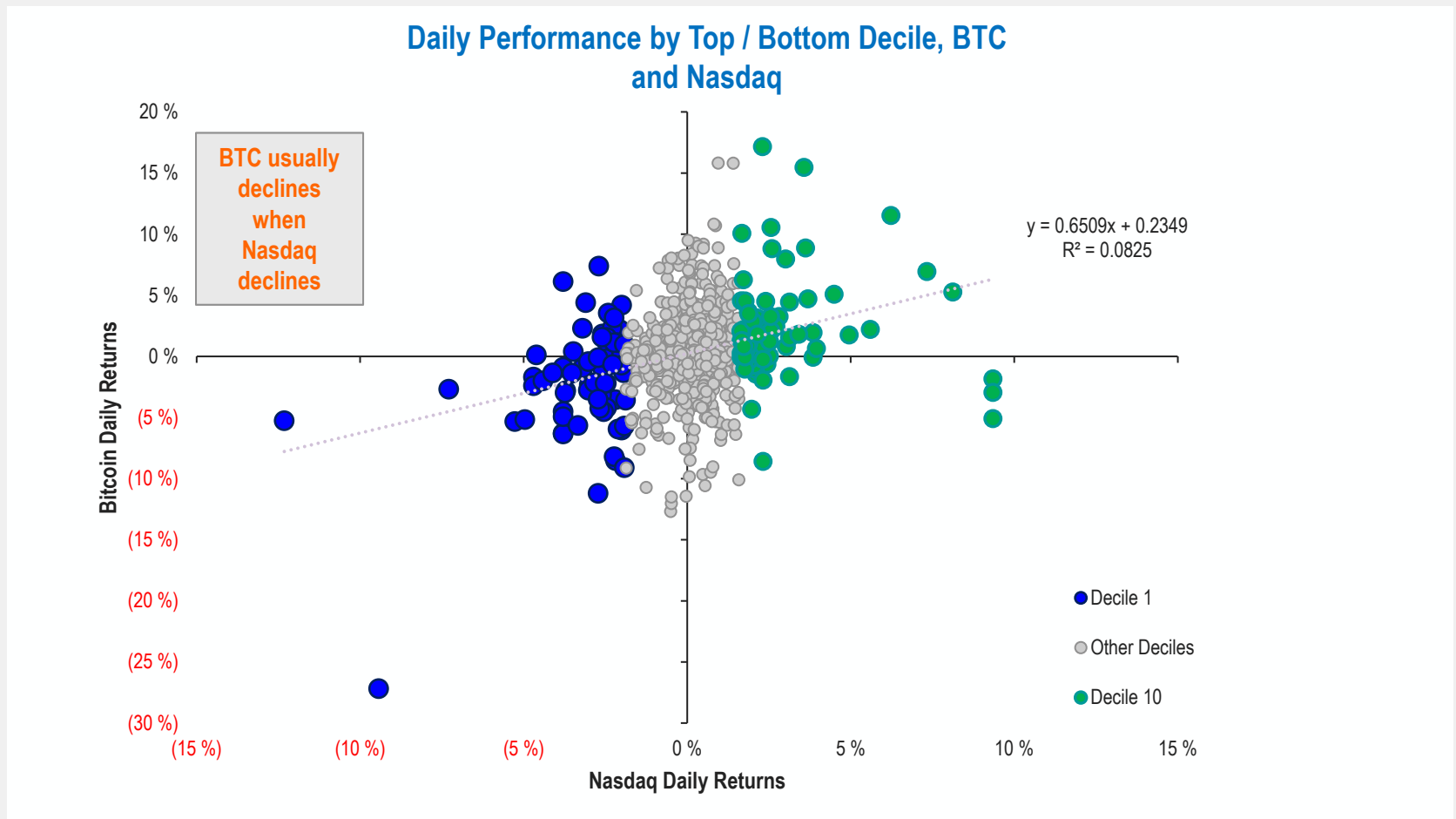


Figure: Bitcoin miner drawdowns
 Note Lowest decile is weakest 10% of daily returns, since 1/1/2020

Source: BitOoda, Bloomberg



Bitcoin Drawdowns Much Deeper and Longer than Equity

- Bitcoin is in its fourth major drawdown since 2014
- Over the same period, equities have exhibited frequent small drawdowns, but have exceeded 10% into correction territory only a handful of times
- There have been only two short-lived bear markets in equities since 2014, including early in the pandemic
- Bitcoin is only intermittently within 10-20% of all time highs

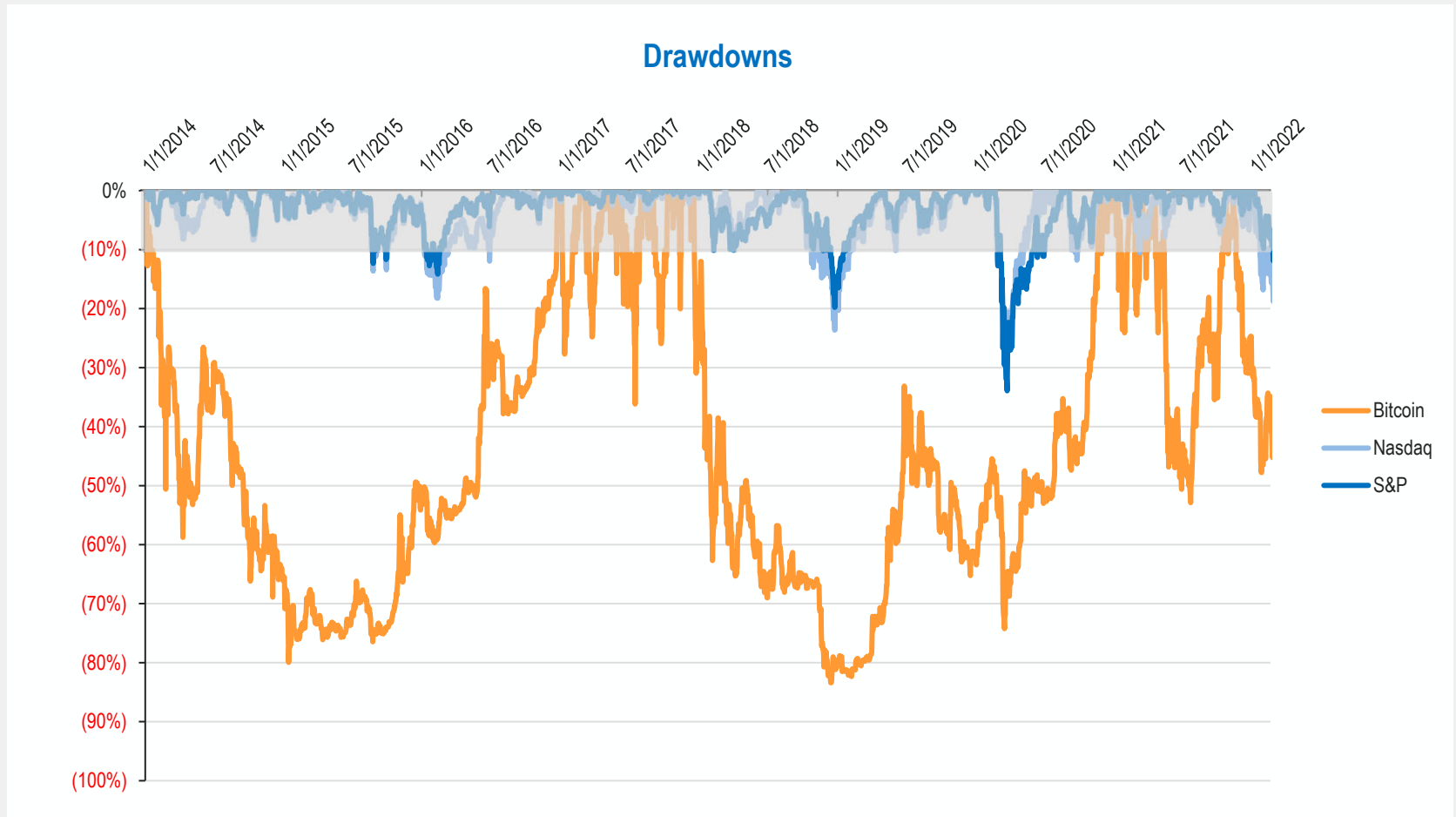


Figure: Drawdowns comparisons: Bitcoin vs the S&P and Nasdaq Composite Since 1/1/2014

Source: BitOoda, Bloomberg





Public Miners

Bitcoin Miners Performance Map

- Relatively few public Bitcoin miners have outperformed Bitcoin YTD
- Most miners are underperforming Bitcoin today, 2/28, although Bitcoin is up over 8%
- Investors are discounting operating leverage, considering the directional divergence between miners and Bitcoin

Year to Date	Quarter to Date	Month to Date	30 Day	7 Day	1 Day
			Stronghold, 51.5%		
			Ebang, 47.0%		
			Canaan, 41.7%		
			Iris Energy, 38.2%		
			Riot, 20.4%		
			Core Scientific, 20.3%		
		Ebang, 40.5%	Marathon, 16.2%		
		Stronghold, 30.6%	Hut8, 10.9%		
Ebang, 24.2%	Ebang, 24.2%	Canaan, 23.9%	Cipher, 9.7%		Marathon, 10.6%
Canaan, 3.5%	Canaan, 3.5%	Iris Energy, 15.5%	Hive, 9.1%	Mawson, 15.6%	Stronghold, 10.4%
Iris Energy, (6.0%)	Iris Energy, (6.0%)	Riot, 11.0%	Terawulf, 9.0%	Stronghold, 13.4%	Digihost, 9.7%
S & P, (8.8%)	S & P, (8.8%)	Marathon, 8.4%	Bitfarms, 7.5%	Core Scientific, 13.3%	Bitfarms, 9.4%
Stronghold, (9.2%)	Stronghold, (9.2%)	Core Scientific, 7.9%	Bit Digital, 7.5%	Iris Energy, 12.3%	Riot, 9.1%
Bitcoin, (12.3%)	Bitcoin, (12.3%)	Bitcoin, 5.7%	Bitcoin, 5.8%	Bitcoin, 9.6%	Bitcoin, 8.5%
Core Scientific, (14.5%)	Core Scientific, (14.5%)	Terawulf, 3.1%	S & P, (1.9%)	Cipher, 8.5%	Hive, 6.8%
Terawulf, (20.0%)	Terawulf, (20.0%)	Hut8, 3.0%	Argo, (3.8%)	Marathon, 6.8%	Canaan, 6.8%
Riot, (20.7%)	Riot, (20.7%)	Bit Digital, 2.9%	Digihost, (4.2%)	Digihost, 6.3%	Hut8, 6.6%
Hut8, (22.0%)	Hut8, (22.0%)	Hive, 2.5%	Cathedral, (7.4%)	Bitfarms, 4.3%	Mawson, 5.5%
Marathon, (22.3%)	Marathon, (22.3%)	Cipher, 0.3%	Northern Data, (8.4%)	Riot, 4.3%	Cipher, 5.5%
Hive, (22.7%)	Hive, (22.7%)	Bitfarms, (1.6%)	Mawson, (13.6%)	Hive, 3.6%	Bit Digital, 5.4%
Cathedral, (22.8%)	Cathedral, (22.8%)	S & P, (3.7%)	Greenidge, (13.9%)	Hut8, 3.0%	Greenidge, 5.1%
Argo, (26.0%)	Argo, (26.0%)	Digihost, (6.1%)		Terawulf, 1.9%	Iris Energy, 5.1%
Digihost, (26.6%)	Digihost, (26.6%)	Northern Data, (8.4%)		Bit Digital, 0.0%	Terawulf, 4.7%
Bitfarms, (28.7%)	Bitfarms, (28.7%)	Cathedral, (10.1%)		S & P, (0.0%)	Ebang, 4.0%
Northern Data, (32.6%)	Northern Data, (32.6%)	Argo, (11.5%)		Argo, (1.0%)	Argo, 3.8%
Cipher, (34.1%)	Cipher, (34.1%)	Greenidge, (18.1%)		Greenidge, (1.2%)	Core Scientific, (0.2%)
Bit Digital, (36.0%)	Bit Digital, (36.0%)	Mawson, (29.7%)		Ebang, (3.1%)	S & P, (0.9%)
Mawson, (39.7%)	Mawson, (39.7%)			Northern Data, (4.4%)	Northern Data, (4.2%)
Greenidge, (40.9%)	Greenidge, (40.9%)			Cathedral, (6.5%)	Cathedral, (7.6%)

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Trading Comparables

Miners Trade at an Adj EV of \$140k per PH/s of 2022YE Hashrate, Up \$10k WoW

- We analyze enterprise value per PH/s of capacity as the clearest comparable metric across all the players
- Our adjusted EV measure factors in the current value of announced Bitcoin holdings, as opposed to balance sheet value at acquisition cost
- Thus, adjusted EV is Market Cap + Debt – Cash – USD value of crypto holdings
- We exclude future capex commitments: for many miners, part of the balance sheet will be used to pay for delivery of future Hashrate, boosting fair EV. However, a lack of data for most companies makes this adjustment imprecise in practice
- On our preferred valuation metric, the group trades at an average of \$550k per current operating PH/s and \$140k per YE 2022 expected PH/s, up \$10k vs. last week

Trading Comparables

Name	Ticker	Name	Price	52-week Range		Market Cap	Cash	Debt	Bitcoin on BS	Bitcoin on BS (USD)	Adj EV	Hashrate			EV/ PH/s		
				Low	High							Current	2022 Deliveries	YE 2022	Current	2022YE	
Bitcoin	XBTUSD	Currency Xbt-Usd Cross Rate	\$40,626.11	\$28,824.32	\$68,991.85	\$770,702											
S&P	SPX Index	S&P 500 Index	4347.02	3723.3	4818.6	\$38,591,643											
Nasdaq	CCMP Index	Nasdaq Composite	13719.41	12397.1	16212.2	\$23,345,372											
Public Miners																	
Argo	ARBK	Argo Blockchain Plc	\$9.00	\$7.51	\$21.00	\$421.3	\$0.0	\$0.0	2317 BTC	\$94.1	\$327.1	1605 PH/s	2000 PH/s	3700 PH/s	\$0.20	\$0.09	
Bit Digital	BTBT	Bit Digital Inc	\$3.88	\$3.16	\$20.74	\$270.3	\$26.5	\$0.0	627 BTC	\$25.5	\$218.3	1603 PH/s	1000 PH/s	2603 PH/s	\$0.14	\$0.08	
Bitfarms	BITF	Bitfarms Ltd/Canada	\$3.60	\$2.75	\$9.36	\$702.9	\$43.3	\$21.1	2973 BTC	\$120.8	\$559.9	2100 PH/s	5900 PH/s	8000 PH/s	\$0.27	\$0.07	
Cathedrala	CBIT CN	Cathedrala Bitcoin Inc	\$0.40	\$0.29	\$0.92	\$34.1	\$5.7	\$0.6	129 BTC	\$5.2	\$23.7	161 PH/s	566 PH/s	727 PH/s	\$0.15	\$0.03	
Cipher	CIFR	Cipher Mining Inc	\$3.05	\$2.33	\$15.39	\$763.0	\$282.3	\$0.0	0 BTC	\$0.0	\$480.8	0 PH/s	8000 PH/s	8000 PH/s	\$0.06	\$0.06	
Cleantalk	CLSK	Cleantalk Inc	\$10.54	\$5.47	\$31.75	\$437.1	\$6.0	\$2.2	838 BTC	\$34.0	\$399.3	1300 PH/s	2458 PH/s	3758 PH/s	\$0.31	\$0.11	
Core Scientific	CORZ	Core Scientific Inc	\$9.36	\$5.82	\$14.98	\$2,970.2	\$1.6	\$0.0	2816 BTC	\$114.4	\$2,854.2	2640 PH/s	12360 PH/s	15000 PH/s	\$1.08	\$0.19	
Digihost	DGHI	Digihost Technology Inc	\$3.40	\$2.44	\$11.64	\$84.9	\$17.3	\$2.5	521 BTC	\$21.2	\$48.8	0 PH/s	2400 PH/s	2400 PH/s	\$0.02	\$0.02	
Greenidge	GREE	Greenidge Generation Holding	\$9.50	\$7.81	\$60.00	\$386.3	\$51.6	\$26.3	0 BTC	\$0.0	\$361.0	1200 PH/s	1900 PH/s	3100 PH/s	\$0.30	\$0.12	
Hive	HIVE	Hive Blockchain Technologies	\$2.04	\$1.50	\$5.60	\$836.1	\$114.3	\$15.7	2854 BTC	\$115.9	\$621.6	2000 PH/s	1000 PH/s	3000 PH/s	\$0.31	\$0.21	
Hut 8	HUT	Hut 8 Mining Corp	\$6.13	\$3.15	\$16.57	\$1,038.7	\$223.2	\$10.3	5053 BTC	\$205.3	\$620.6	1700 PH/s	2800 PH/s	4500 PH/s	\$0.37	\$0.14	
Iris Energy	IREN	Iris Energy Ltd	\$15.21	\$8.55	\$28.25	\$836.8	\$118.6	\$0.0	0 BTC	\$0.0	\$718.3	1452 PH/s	5671 PH/s	7123 PH/s	\$0.49	\$0.10	
Marathon	MARA	Marathon Digital Holdings In	\$25.53	\$18.32	\$83.45	\$2,620.2	\$32.9	\$0.0	7453 BTC	\$302.8	\$2,284.5	3200 PH/s	20100 PH/s	23300 PH/s	\$0.71	\$0.10	
Mawson	MIGI	Mawson Infrastructure Group	\$4.00	\$2.00	\$17.25	\$276.0	\$32.4	\$3.8	0 BTC	\$0.0	\$247.4	800 PH/s	3350 PH/s	4150 PH/s	\$0.31	\$0.06	
Northern Data	NB2 GY	Northern Data Ag	\$52.40	\$40.20	\$134.00	\$1,217.8	\$0.0	\$0.0	0 BTC	\$0.0	\$1,217.8	660 PH/s	2600 PH/s	3260 PH/s	\$1.85	\$0.37	
Riot	RIOT	Riot Blockchain Inc	\$17.68	\$12.90	\$67.85	\$2,061.3	\$71.5	\$8.4	4464 BTC	\$181.4	\$1,816.8	3000 PH/s	6000 PH/s	9000 PH/s	\$0.61	\$0.20	
Stronghold	SDIG	Stronghold Digital Mining-A	\$11.67	\$7.26	\$35.80	\$562.6	\$41.4	\$54.5	56 BTC	\$2.3	\$573.4	470 PH/s	7600 PH/s	8070 PH/s	\$1.22	\$0.07	
Terawulf	WULF	Terawulf Inc	\$12.04	\$8.65	\$43.98	\$1,203.7	\$1.5	\$0.0	0 BTC	\$0.0	\$1,202.2	0 PH/s	2100 PH/s	2100 PH/s	\$0.57	\$0.57	
Total						\$16,723.2	\$1,070.0	\$145.5	30101 BTC	\$1,222.9	\$14,575.8	23891 PH/s	87805 PH/s	111791 PH/s	\$0.61	\$0.13	
Average						\$929.1	\$59.4	\$8.1	1672 BTC	\$67.9	\$809.8	1327 PH/s	4878 PH/s	6211 PH/s	\$0.55	\$0.14	
Median						\$733.0	\$32.6	\$1.4	574 BTC	\$23.3	\$566.7	1376 PH/s	2700 PH/s	3954 PH/s	\$0.31	\$0.10	

Figure: Comparable analysis: Adjusted Enterprise Value per PH/s of YE 2022 Capacity

Source: BitOoda, Bloomberg

Adj EV / 2022YE PH/s Average of \$140k

- The chart shows the adjusted EV per PH/s of expected 2022 YE Hashrate valuation
- The group trades at an average of \$140k per future PH/s

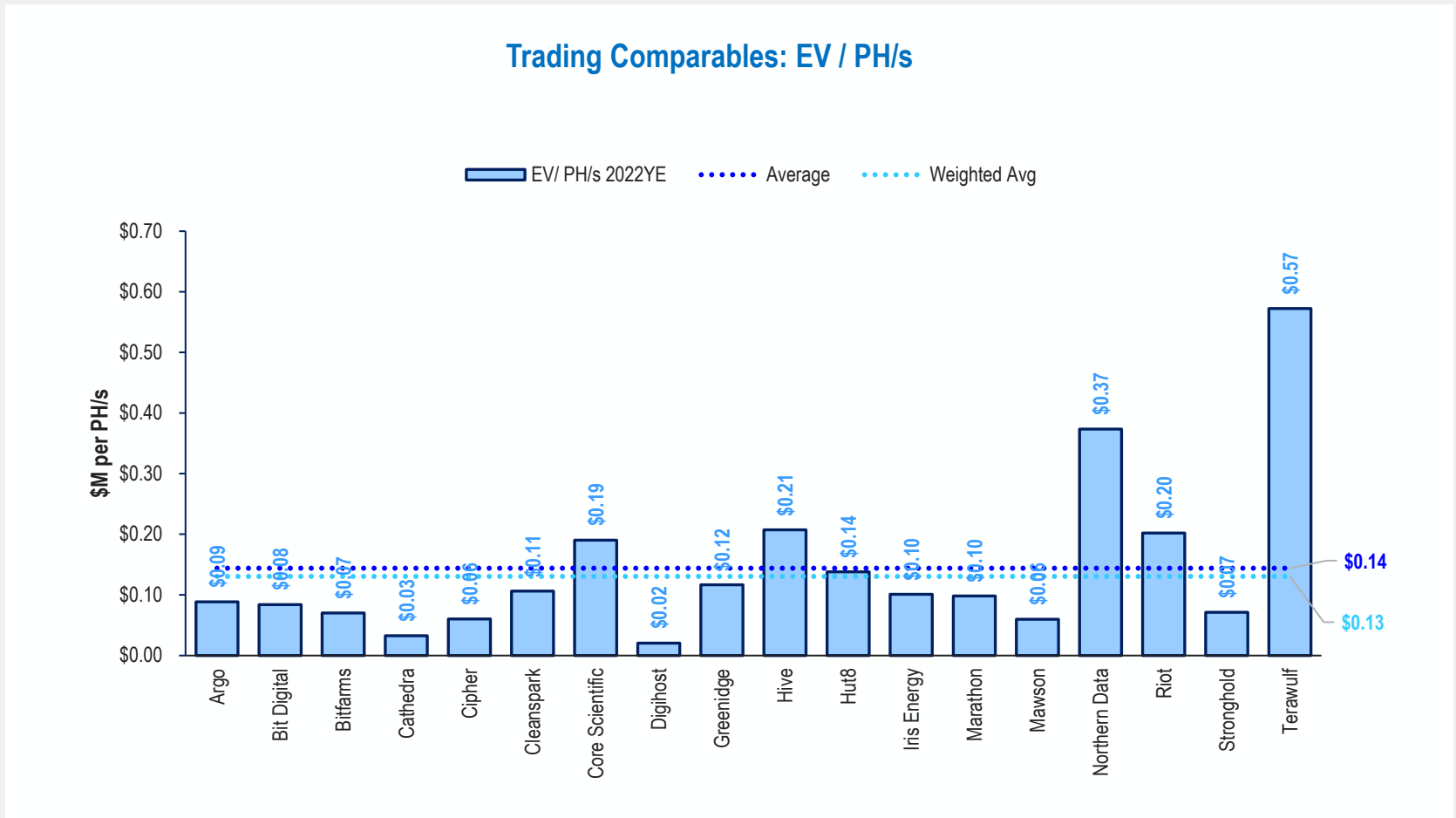


Figure: Comparable analysis: Adjusted Enterprise Value per PH/s of YE 2022 Capacity

Source: BitOoda, Bloomberg





Valuations are Higher The More YE 2022 Hashrate Comes Online

- Markets give a premium to operational capacity
- The more year end 2022 capacity is already online, the higher the valuation
- This supports the notion that the market recognizes the drop off in Bitcoin production over time
- However, we are seeing this relationship degrade in the past few weeks, suggesting that market differentiation across other dimensions of operations and the distinct business models is increasing
- **Thus, the less growth is in the future, the higher the multiple; this is quite unlike most traditional equities**

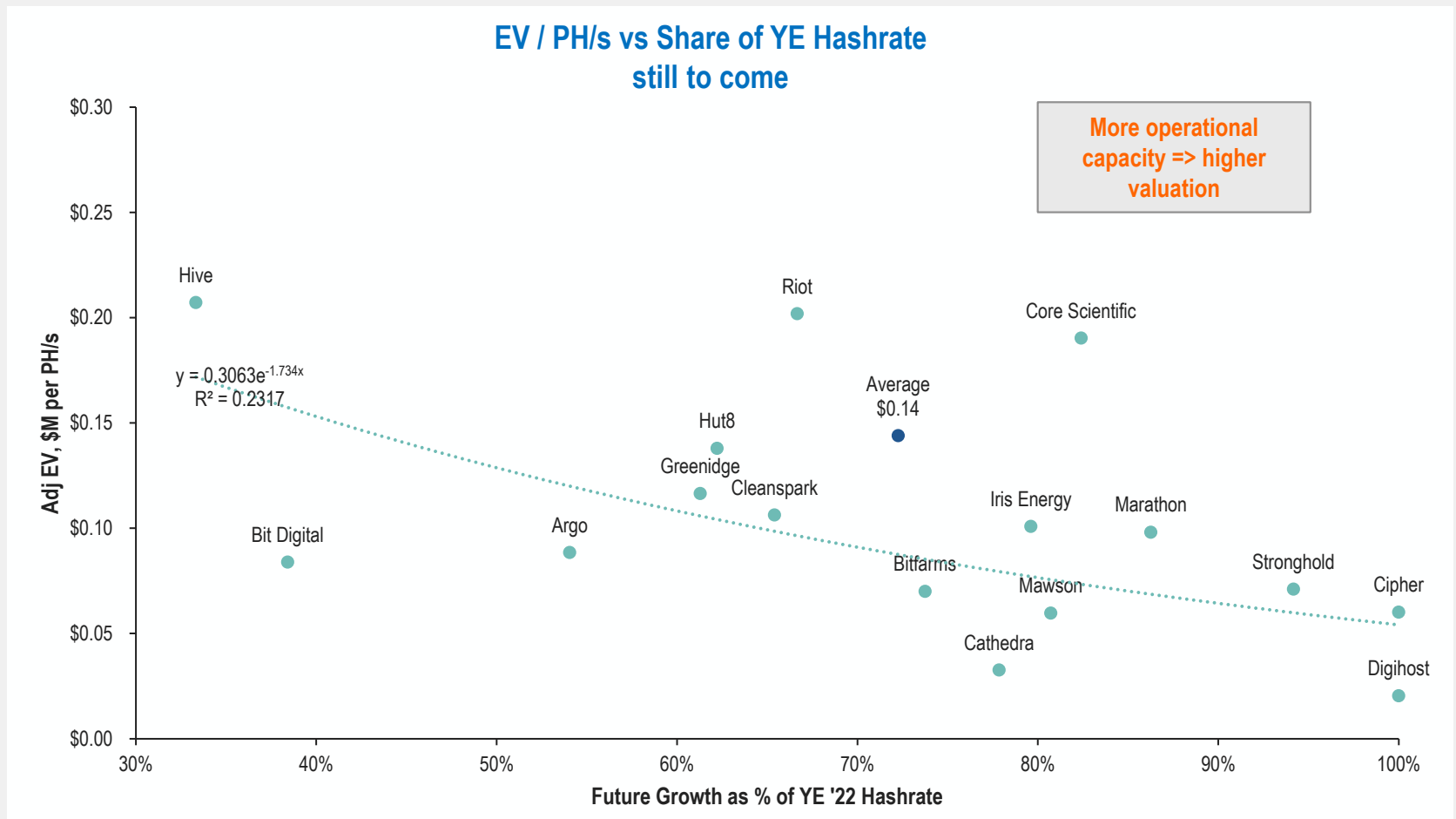


Figure: Public miner adjusted EV per PH/s vs. percentage of YE 22 Hashrate already operational

Source: BitOoda, Bloomberg

Note: Terawulf and Northern Data excluded as outliers



Valuation Differentials Aided by Power / Hosting Costs

- Entities with the lowest direct operating cost, such as Greenidge and Riot, exhibit a premium to the group
- However, for most other companies, the relationship is weaker
- Hive, which has the highest valuation in the group, has a higher estimated all-in direct operating cost (based on BitOoda’s estimates)
- Hive also has the largest share of YE 2022 Hashrate already operational, which may explain the higher valuation

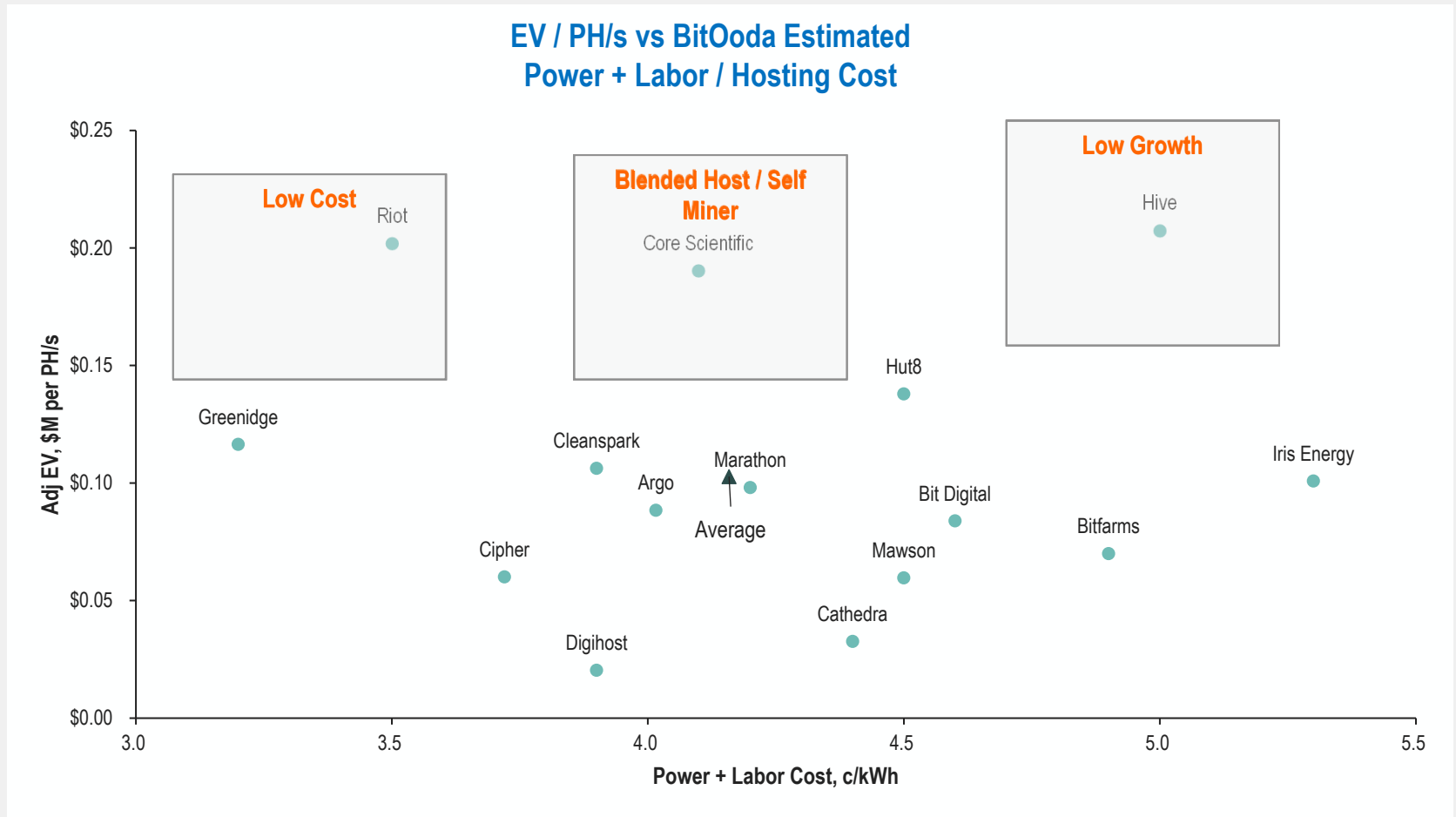


Figure: Adjusted EV per PH/s vs all in power + labor or hosting cost, cents per kWh

Source: BitOoda, Bloomberg

Note: 1. BitOoda estimates based on publicly available information; may not fully reflect actual all-in cost. 2. Excludes Terawulf and Northern Data

Select Financials

Few Analyst Estimates For Industry Aggregate Metrics

- The median trailing gross margin was 62%, with a 43% EBITDA margin
- As a group, the miners are expected to generate \$3.2B in 2022 EBITDA on \$5B in revenue, based on Bloomberg consensus
- The group trades at an average 7.6x 2022E contribution (defined as cash cost of sales, adding back D&A to gross profit) and 3.5x Adj EV to 2022E EBITDA

Select Miner Financials

Name	Ticker	LTM Margins		Revenue		Gross Margin			EBITDA			D&A	EBIT			Contribution CY22E	Multiple of Contribution	Adj EV / 2022E EBITDA	
		Gross	EBITDA	LTM	CY21E	CY22E	LTM	CY21E	CY22E	LTM	CY21E	CY22E	CY22E	LTM	CY21E				CY22E
Argo	ARBK				100.14	152.59	80.80	80.80		76.50	126.98	31.01		57.93	95.96	111.92	2.9x	2.6x	
Bit Digital	BTBT				109.00	112.00	73.30	73.30						35.40	37.00		—	—	
Bitfarms	BITF			121.22	172.00	244.00	69.80	69.80						86.60	112.00		—	—	
Cathedrala	CBIT CN	31.04	260.07	3.08					31.04				4.64				—	—	
Cipher	CIFR			0.00													—	1.8x	
Cleanspark	CLSK	75.76	(0.87)	88.42	45.55	182.50	75.76	73.20	73.20	1.16	(4.90)	88.50	36.05	(17.97)	(17.75)	52.45	69.39	5.8x	4.5x
Core Scientific	CORZ				472.67	1018.50	57.60	57.60				198.33	559.50	104.50	158.33	455.00	376.76	7.6x	5.1x
Digihost	DGHI																	—	—
Greenidge	GREE				125.00	231.00						49.70	124.00	42.70	(43.00)	81.30		—	2.9x
Hive	HIVE	67.29	120.30	240.03	193.69	160.49	67.29	69.60	69.60	260.21			214.38	123.33	63.09			—	—
Huib	HUT	42.37	47.17	129.39	140.70	322.18	42.37	53.15	53.15	47.13	81.97	216.95	48.08	29.40	49.82	168.87	122.86	5.1x	2.9x
Iris Energy	IREN				72.23	328.67		80.50	80.50		42.18	236.17	44.17		155.33	192.00	102.31	7.0x	3.0x
Marathon	MARA	75.08	(331.22)	92.83	151.00	704.80	75.08	79.25	79.25	(93.86)	120.00	508.25	68.92	(111.67)	25.05	439.33	188.58	12.1x	4.5x
Mawson	MIGI																	—	—
Northern Data	NB2 GY				231.05	807.52		66.30	66.30		117.81	602.78	218.47		36.60	384.32	371.65	3.3x	2.0x
Riot	RIOT	62.15	43.49	127.64	211.00	445.38	62.15	65.40	65.40	20.11	109.15	270.67	124.40	(2.84)	48.39	146.27	262.39	6.9x	6.7x
Stronghold	SDIG				33.68	296.60		4.00	4.00		9.49	210.20	30.40		(2.89)	179.80	31.75	18.1x	2.7x
Terawulf	WULF	33.76	(4.61)	16.30			33.76			(0.76)				(1.51)				—	—
Total				818.91	2057.70	5006.22				238.64	795.24	3215.00	748.69	61.17	713.13	2407.40			
Average		55.35	19.19	90.99	158.28	385.09	55.35	64.41	64.41	34.09	72.29	292.27	74.87	6.80	54.86	185.18	181.96	7.6x	3.5x
Median		62.15	43.49	92.83	140.70	296.60	62.15	69.70	69.70	4.64	76.50	236.17	46.12	(2.84)	48.39	146.27	122.86	6.9x	2.9x

Figure: Select financial metrics – Bloomberg consensus revenue and EBITDA estimates
 Note: Contribution is BitOoda estimate of gross profit less depreciation

Source: BitOoda, Bloomberg

Drawdowns From BTC Peak Miners Underperforming Bitcoin

- Bitcoin is off 41% from its peak on November 10, 2021
- Over the same period, the S&P 500 is down 10% and the Nasdaq 15%
- Most miners have underperformed Bitcoin since November 2021 by an average additional 13%

Drawdowns Since 11/10/21 BTC Peak

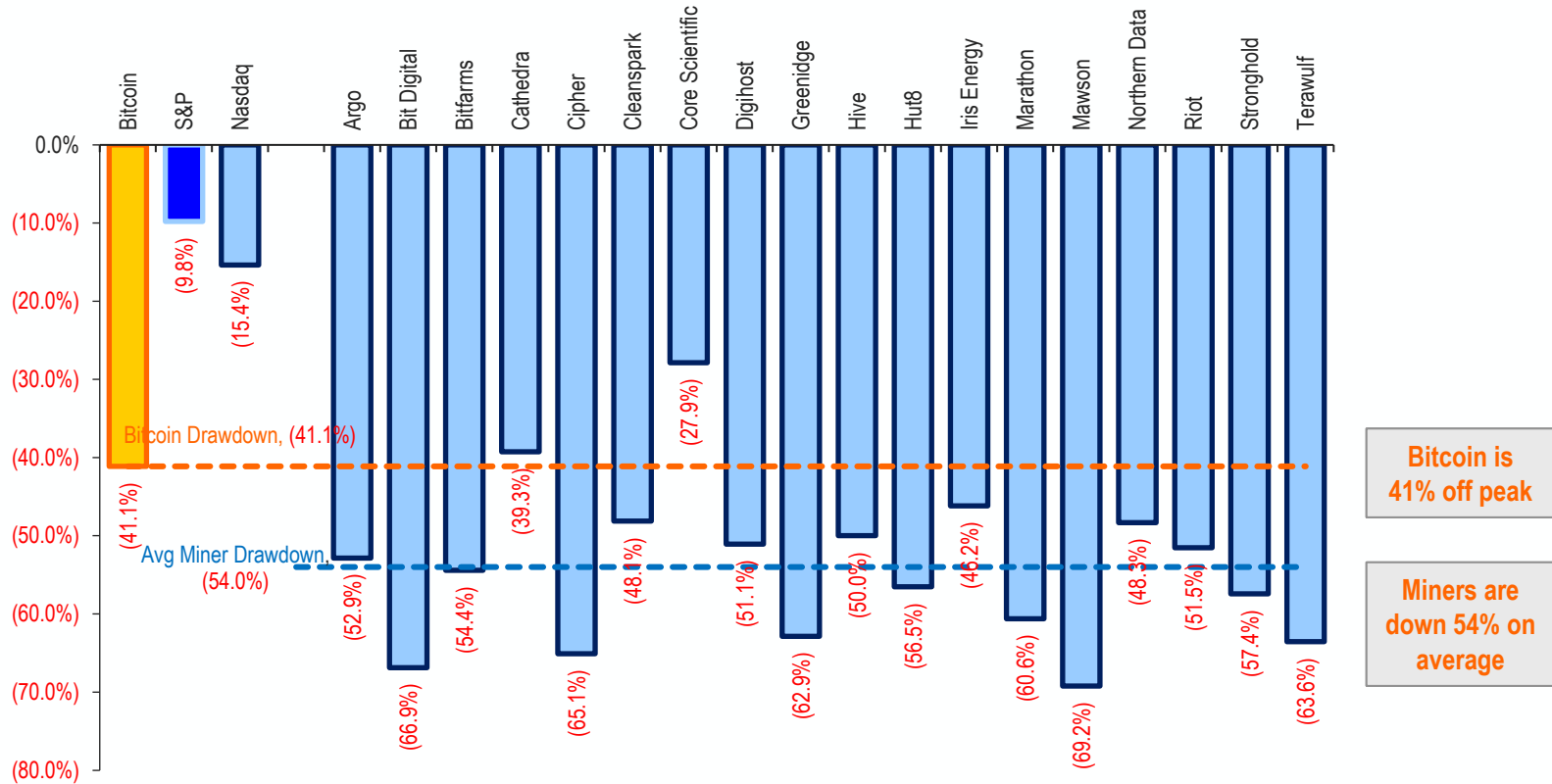


Figure: Bitcoin miner drawdowns
 Notes: 1. Iris Energy's drawdown measured from 11/17/21

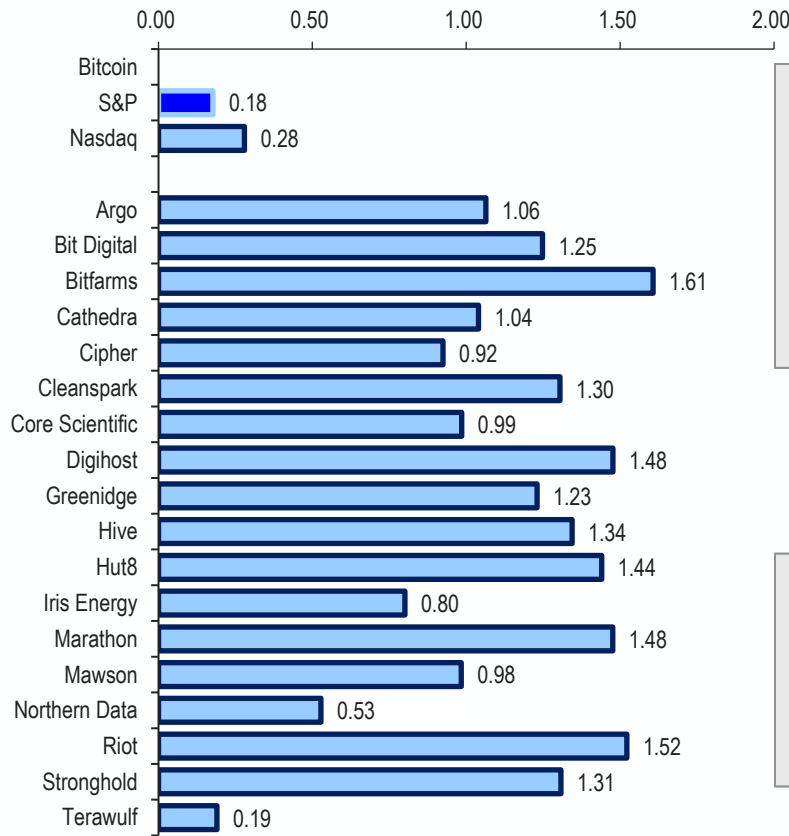
Source: BitOoda, Bloomberg

Beta & Correlation

Not All Miners Are Equal

- We expect most miners to exhibit a Beta > 1 relative to Bitcoin
- Bitcoin is off 41% from its November 2021 peak, Hashrate is up, and transaction fees are flattish, so miners should experience both falling revenue and margin compression
- Interestingly, although most miners have underperformed Bitcoin, both the beta to Bitcoin and correlation to Bitcoin show much more dispersion
- The correlation of Bitcoin to the S&P and Nasdaq is quite high, at 52% & 57%, respectively
- **The correlation to equities is picking up again as macro fears affect equity markets**

Beta to BTC Since BTC Peak



Bitcoin has a 47% correlation to the S&P and 53% to the Nasdaq since its peak

Some miners show both a low Beta and a low correlation to Bitcoin

Correl to BTC since BTC Peak

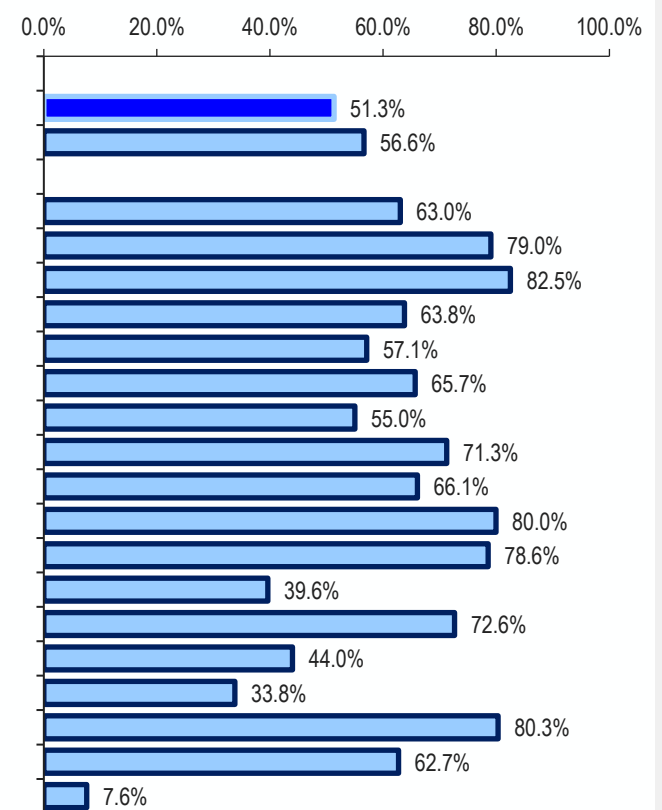


Figure: Bitcoin miner drawdowns
 Note 1. Iris Energy's drawdown measured from 11/17/21

Source: BitOoda, Bloomberg



Institutional Fund Flows



Select Fund Analysis

GBTC is Largest; Most are Small

- GBTC, an ETP, has the largest Assets Under Management (AUM) in our select group below, representing \$20B of the \$26B AUM for the group
- Some of the other large-ish funds with crypto exposure include ARKW, BITO, BLOK and BITW
- Of these, GBTC appears not to have raised any capital in recent times
- Please let us know of any funds you would like to see included in the data

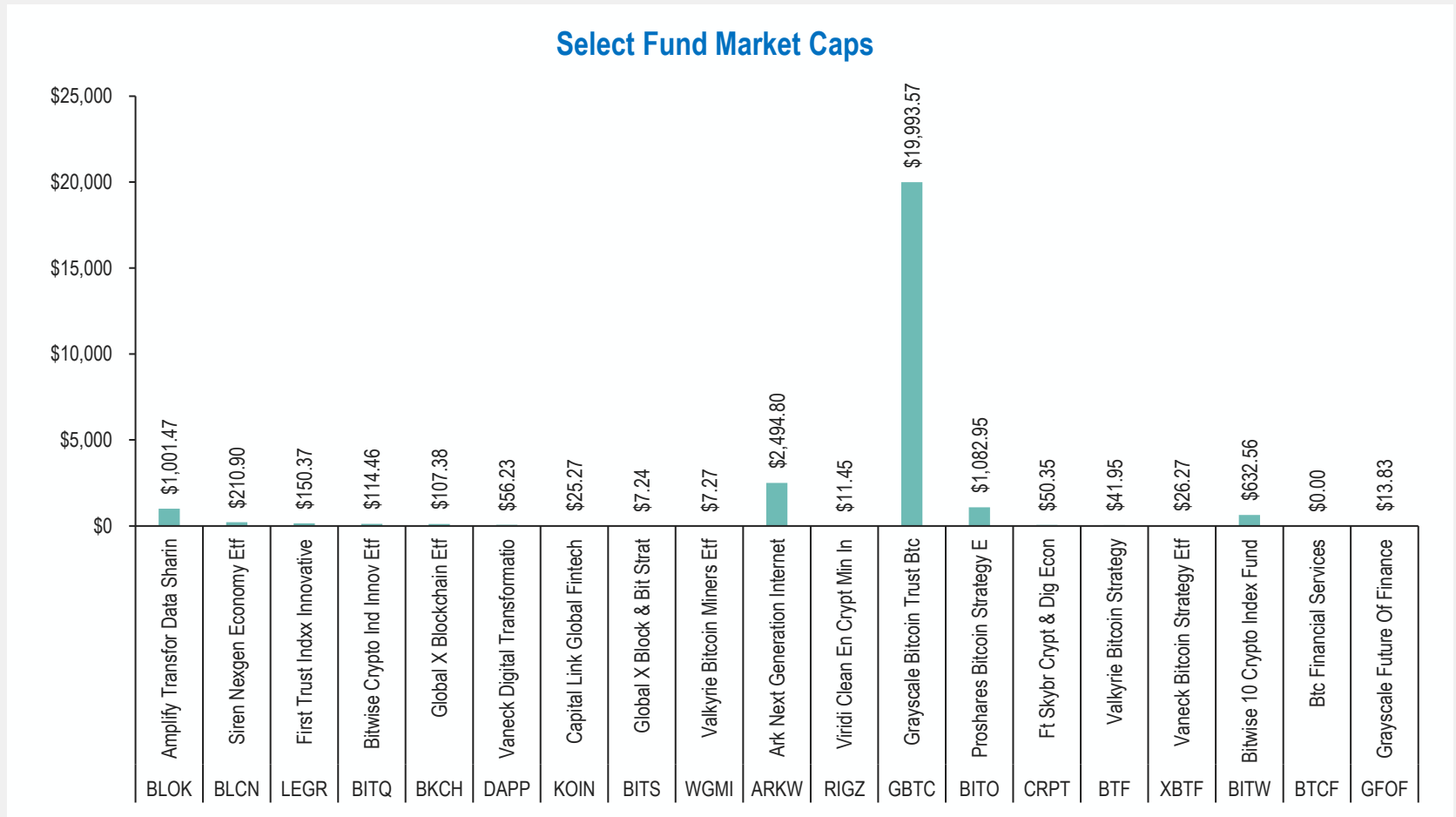


Figure: Select fund markets caps
As of 2/28/2022

Source: BitOoda, Bloomberg

Cumulative Flows

Modest Outflows Over Past Year

- Just over a year ago, the week ending 2/22/2021 saw \$905mm in inflows, as we discussed last week
- The select fund group saw consistent outflows for much of the last year, offset by inflows into BITO upon launch in October.
- Overall, our selected funds show outflows of \$57mm over the past year

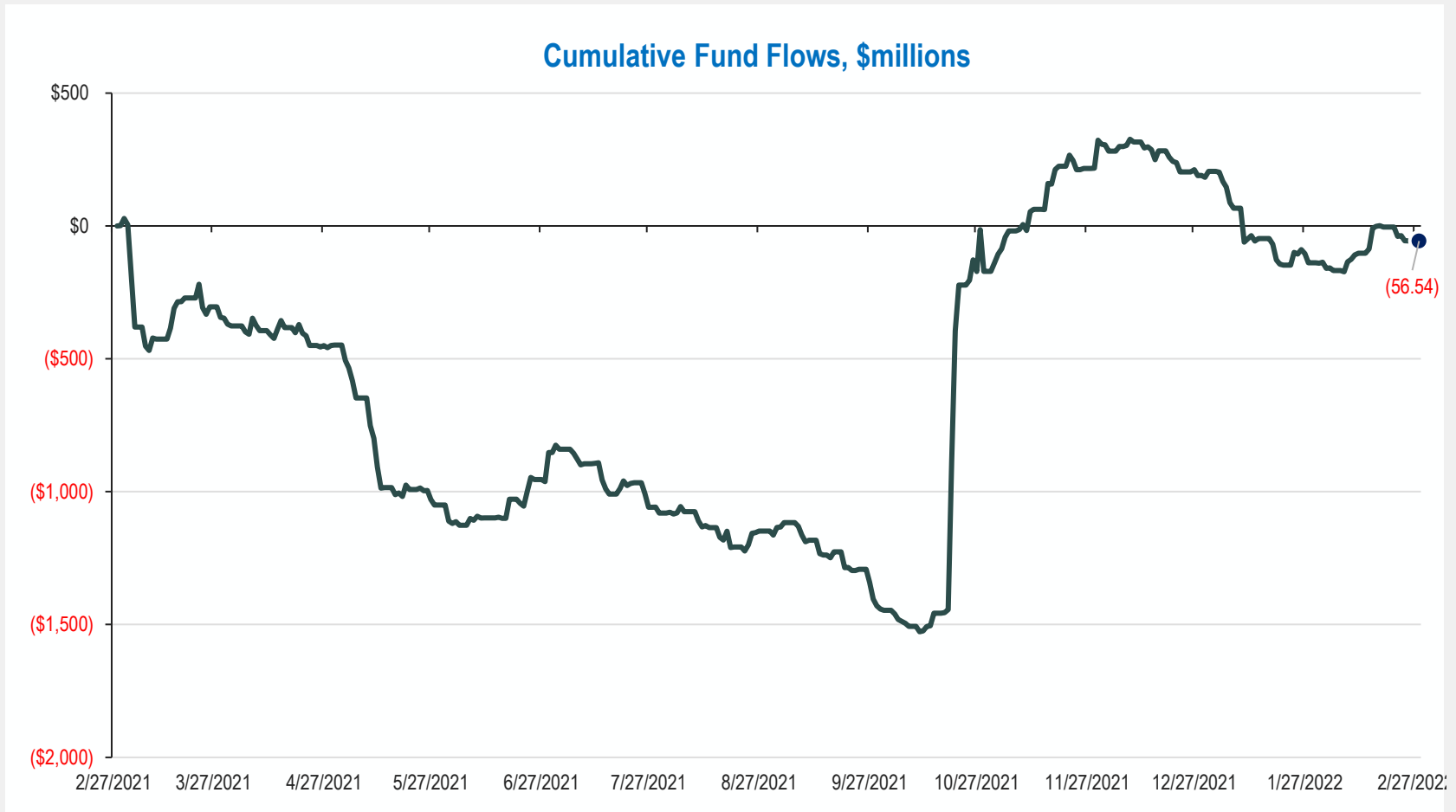


Figure: Cumulative fund flows for select crypto / crypto exposed funds
Trailing one year

Source: BitOoda, Bloomberg





Select Flows

BITO, BLOK Inflows; ARKW Outflows

- Over the past year, ARKW – which is not just exposed to crypto but to Web 3 / tech innovation more broadly – has seen \$3 billion of outflows
- Over the same period, BITO has seen \$1.7B of inflows, with BLOK receiving \$464mm and other selected funds receiving \$750mm of inflows

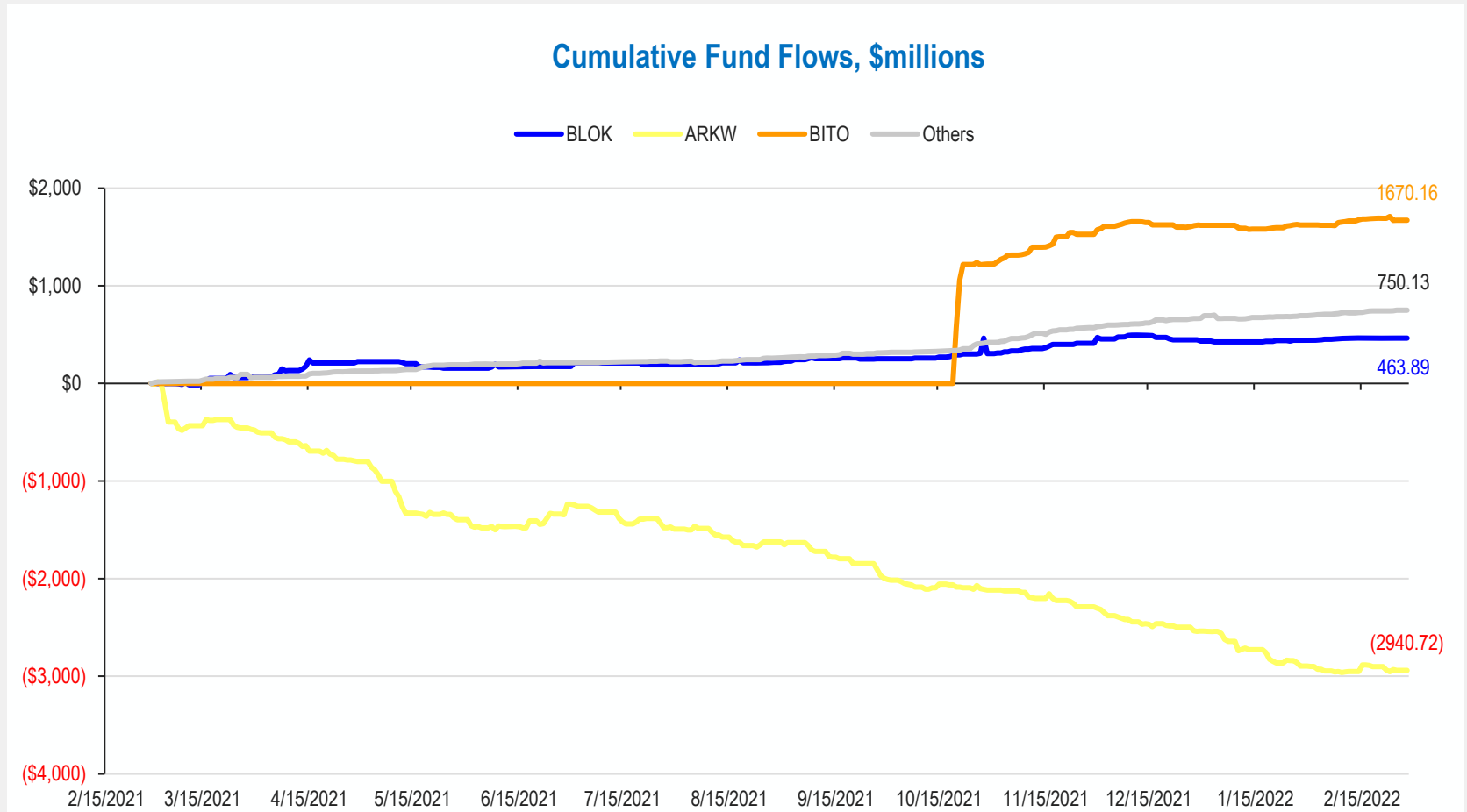


Figure: Cumulative fund flows for select crypto / crypto exposed funds
Trailing one year

Source: BitOoda, Bloomberg

YTD Daily Fund Flows

\$261mm Outflows; \$52mm in Past Week Alone

- Since the beginning of the year, the fund group saw \$261mm in redemptions
- The group saw \$52mm of outflows last week

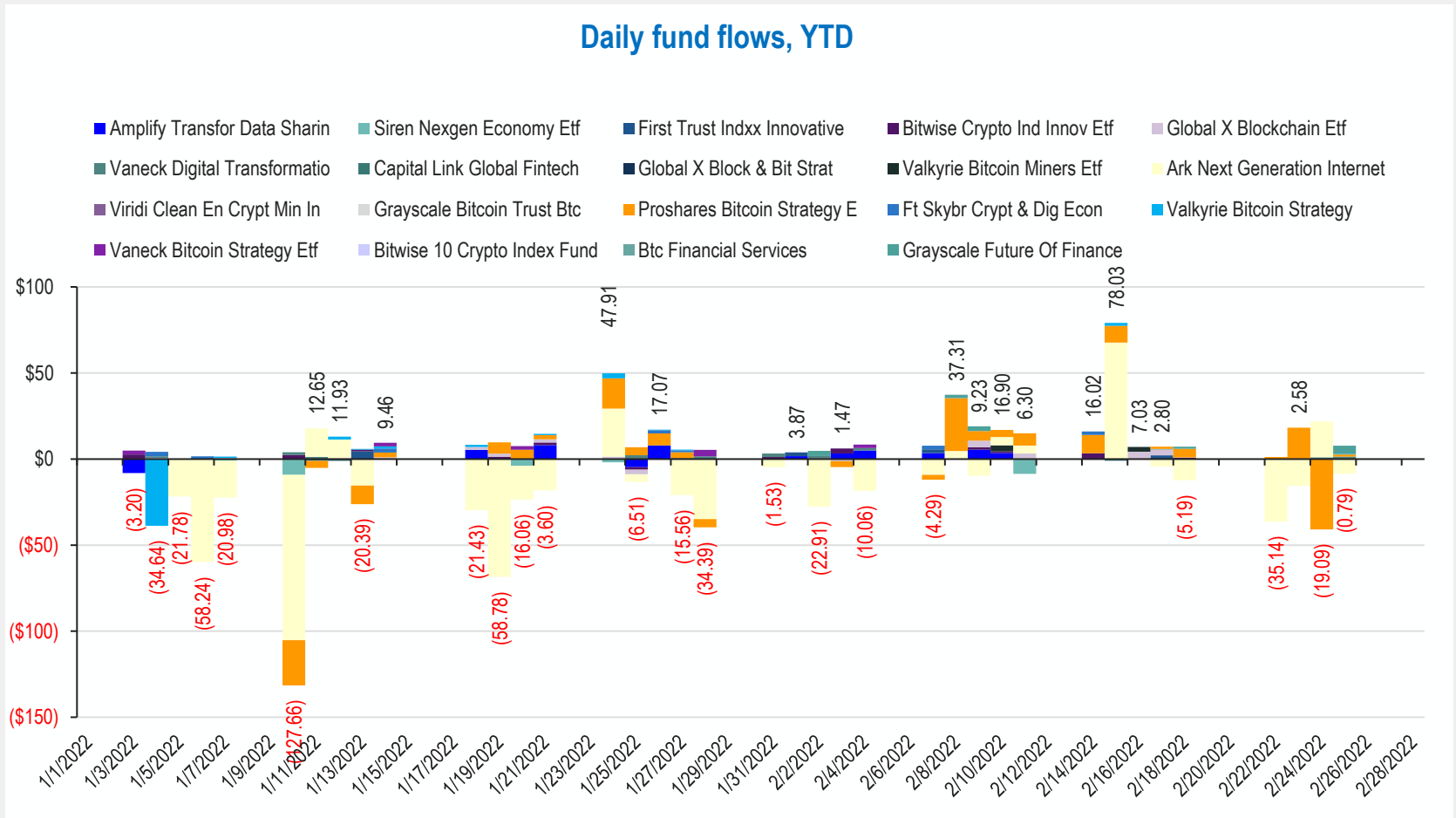


Figure: Daily fund flows Since 1/1/2022

Source: BitOoda, Bloomberg



ProShares Futures ETF BITO

Modest, Expected Underperformance

- The ProShares ETF BITO currently has a market cap of \$1082 million
- The ETF has underperformed Bitcoin by 2.5%, declining by 38.6% since launch vs. a 36.2% decline in the price of BTC in the same timeframe
- This is expected given the cost of rolling the futures contracts each month

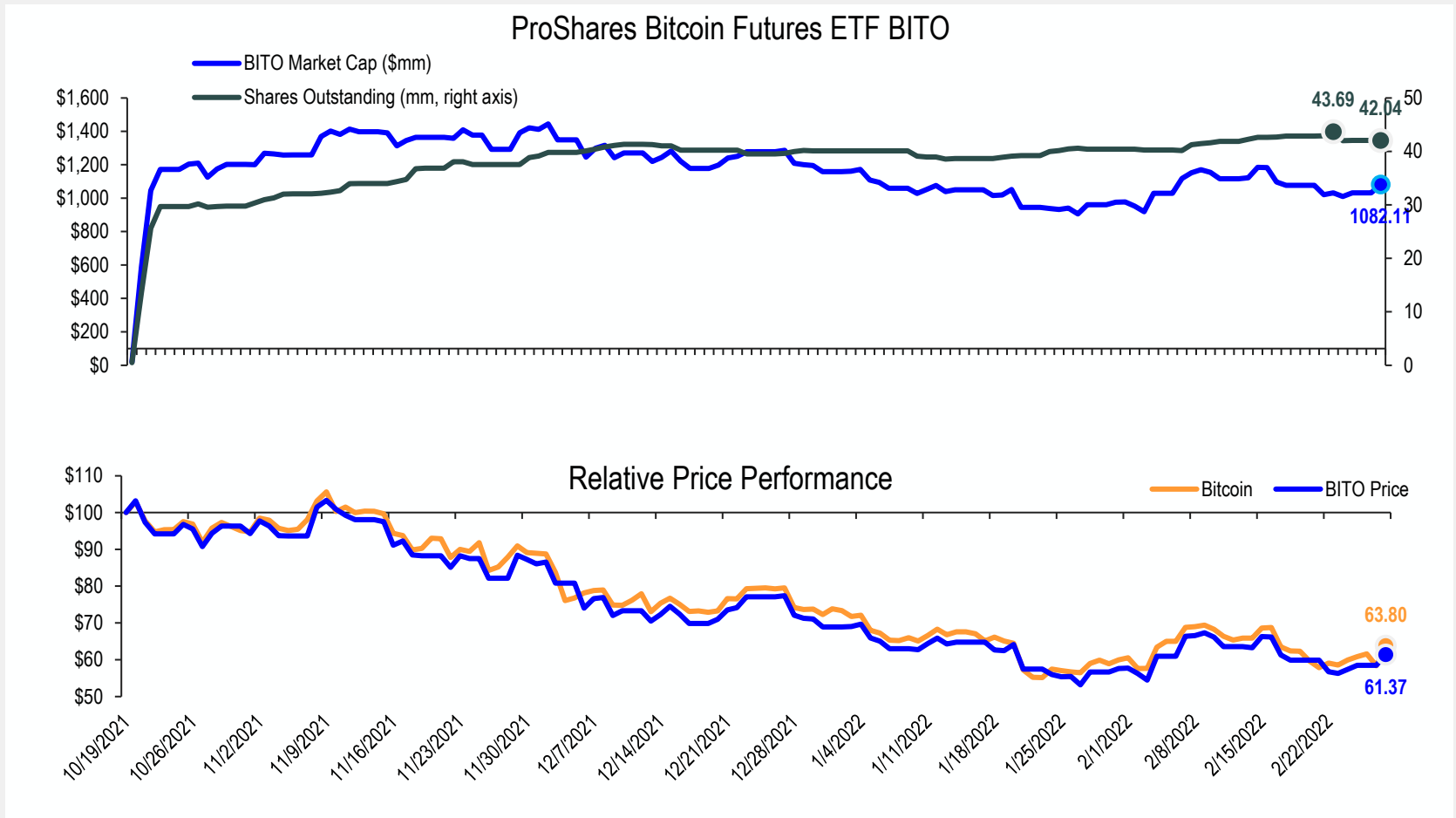


Figure: ProShares Bitcoin Strategy Futures ETF market cap and price performance compared to Bitcoin

Source: BitOoda, Bloomberg



ProShares Futures ETF BITO \$41mm redemptions on 2/24

- The ProShares ETF BITO saw ~\$41mm of redemptions on 2/24
- This is consistent with the risk off trade we saw with the Russian invasion of Ukraine

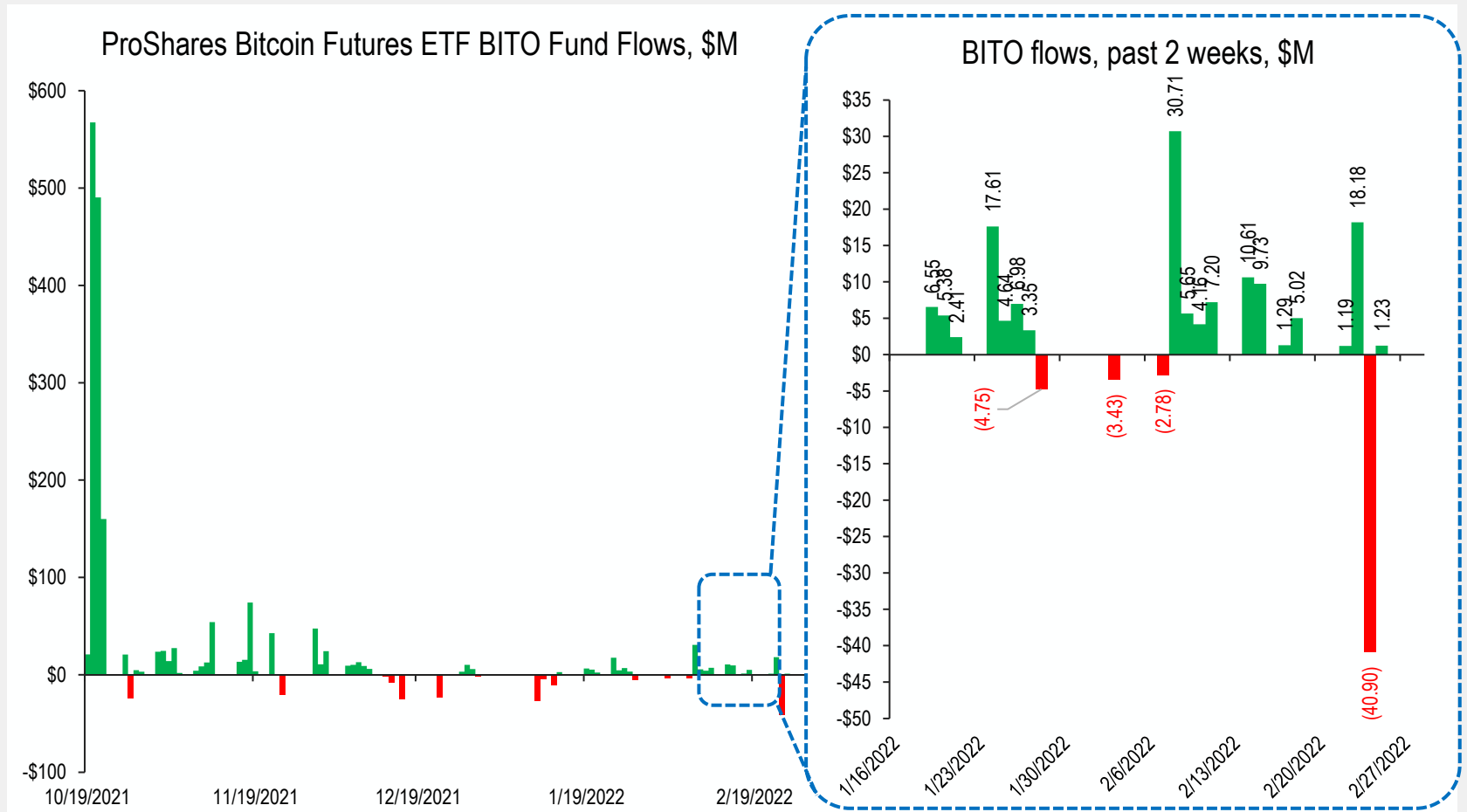


Figure: ProShares Bitcoin Strategy Futures ETF market cap and price performance compared to Bitcoin

Source: BitOoda, Bloomberg



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