May 9, 2022

Bit**o**oda

Bitcoin Public Markets: Macro Correlation Here to Stay

Hard Landing, Rig Price, Hashrate Risks Compound; We Seek Hedged Miners and Distressed Deals

The markets are digesting the limitations of fed policy on containing inflation and the risks of stagflation. Raising rates slows economic activity by constraining demand – whether for final products and services or for upstream equipment and investment to deliver final goods and services. The notion is that raising rates incentivizes saving over spending and thus reduces consumption and capital expenditures – with capital expenditures likely proving more sensitive owing to a stronger rational decision making process. If volume demanded falls, prices should fall or at least grow slower to clear the market.

To the extent that inflationary pressures emanate from global supply side bottlenecks – whether from Asian covid lockdowns, the Russian invasion of Ukraine, transportation shortages and rising energy prices, the demand – supply volume mismatch driving inflation is more led by below trend supply than above trend demand.

Demand management requires a coordinated global response that may not be forthcoming. Without a coordinated response, Fed policy will necessarily have a much greater impact on domestic demand than overseas, in an effort to balance the much broader global demand with global supply. Furthermore, we assess that raising rates to drive demand volume below trend to meet the much harder to fix (with monetary policy) supply volume shortfall essentially means very little margin for error to avoid a hard landing.

Raising rates essentially compresses the P/E multiple across asset classes. This results in a correlated trade that extends to crypto as institutional capital increasingly drives crypto flows.

Thus, the broader policy response function of financial institutions has a growing weight in the crypto markets.

We think the risk off environment is likely to persist longer than we originally anticipated, and that crypto will remain a correlated trade in this environment.

Equally, we believe that the steadily expanding role of crypto long-term disruption of existing financial systems makes the asset class resilient. Thus investors need to maintain exposure to the space. By the same token many of the public equities in the space face growth challenges as capital access erodes and the volatility of the asset weighs on treasury Bitcoin.

Hedging needs for the space are more critical than ever and will ultimately differentiate the winners in the space – particularly those that use creative structured products to mitigate multiple risks to emerge with a superior business model. The days of a miner being viewed as a proxy for Bitcoin to fit within a fund manager's mandate are over, by our assessment.

We believe that smaller, undercapitalized crypto miners are at risk of default on their equipment purchase schedule. Further, very few, if any, miners or hosting facilities have fixed price power contracts. Which means that the energy market dislocations, coupled with capital calls on rig deliveries, could pose significant downside risk to ASIC rig pricing as well as capacity growth, resulting in network target Hashrate below our prior estimates.

This downside could come from accelerating shut down of older gen rigs, fewer deployments, and miner / hosting defaults that create distressed asset opportunities.

Key Takeaways

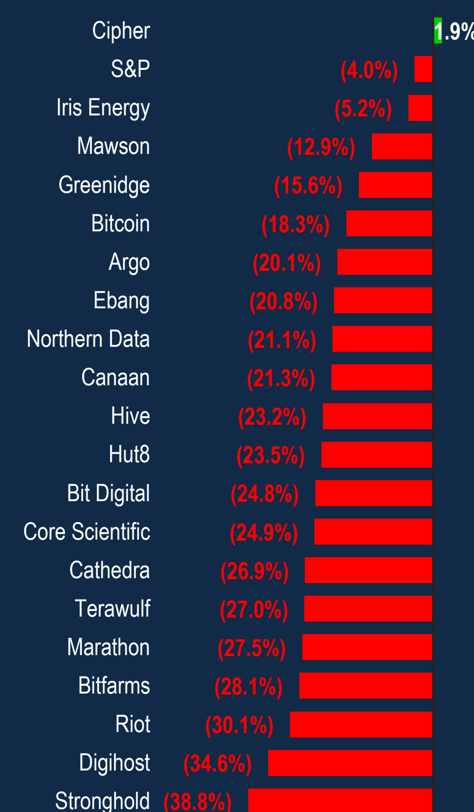
- *We assess the macro environment is going to be weaker for longer*
- *We see very little margin of error to avoid a hard landing for the economy*
- *Crypto markets are likely to stay deeply correlated to macro risk assets for an extended period*
- *Longer term, we believe investors should maintain exposure to the asset class as the disruption to existing financial systems could accelerate in the current policy environment*
- *Miners who have avoided hedging so far must reassess their risk management strategy, in our view*
- *There could be opportunities for well capitalized players in the coming weeks and months*
- *In the interim, we believe there is significant downside risk to both ASIC rig prices and Hashrate growth estimates*

Research

Sam Doctor[ac]
Chief Strategy Officer | Head of Research
sam@bitooda.io | @Sam_Doc

BTC Price (5/9 at 7:30 pm ET)	$30,596
Obs Hashrate	212 EH/s

7 Day Performance



Please see slide 12 for important disclosures.

Bitcoin Miners Off 67%
Correlated Selloff Continues

- Coinbase is down to 26.6% of its 11/18/21, while the miner group is down to 35%
- Over the same period Bitcoin is down to 54% while Ethereum is at 57%
- **The correlation vs the Nasdaq 100 Tech subgroup is very visible here, although not quantified**
- **Later in this report, we show that the correlation of Bitcoin to the broader Nasdaq Composite is now at 66%**

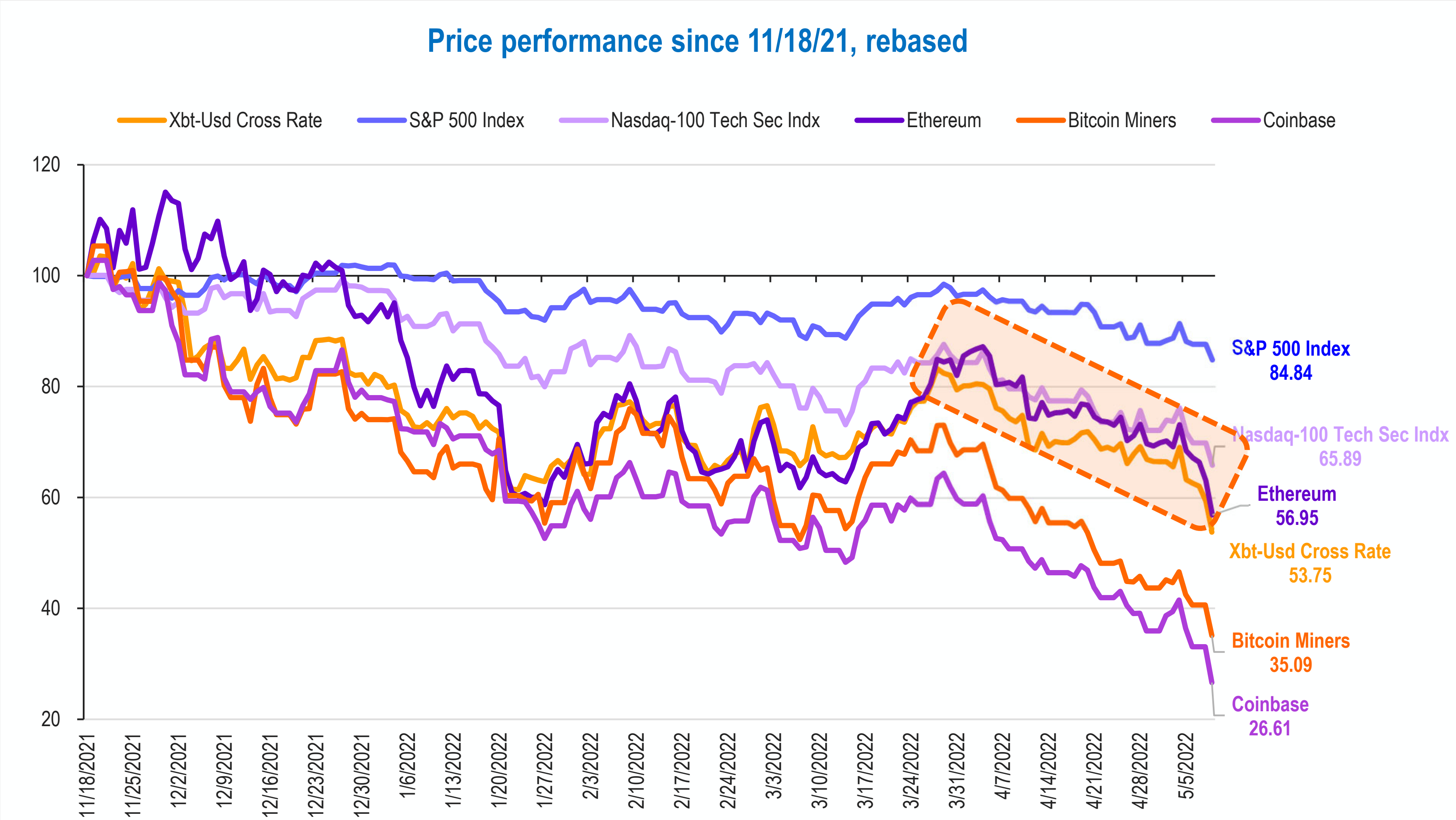


Figure: Bitcoin, Ethereum, Coinbase, BitOoda Bitcoin miner index and select equity indices
Rebased since 11/18/2021 (11/18/2021 = 100)

Source: BitOoda, Bloomberg

P/E Multiples are Compressing
The 10Y Treasury is at 33x vs 75x Peak

- As treasury yields rise, the implied multiple has been compressing – along with multiples for major asset classes
- Cheaper risk free multiples essentially mean that risk assets have to see multiple compression

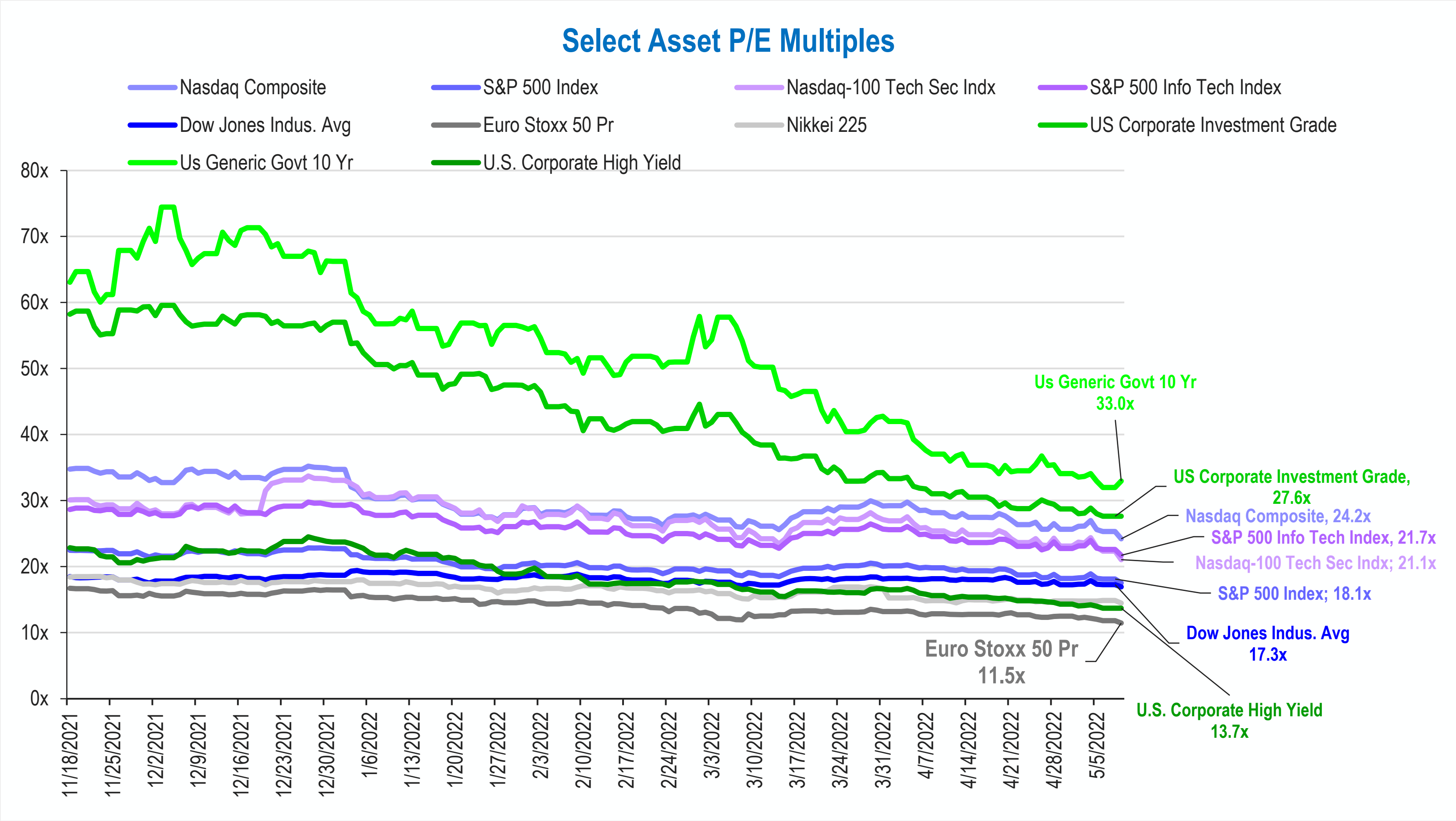


Figure: Select asset P/E multiples since 11/18/21

Source: BitOoda, Bloomberg

P/E Spreads Narrowing

Risk Assets Trade at a Smaller Multiple Discount to the 10Y

- As can be seen below, along side the US 10 Year treasury multiple compressing, many assets are at fewer turns below the US Treasury multiple, essentially converging

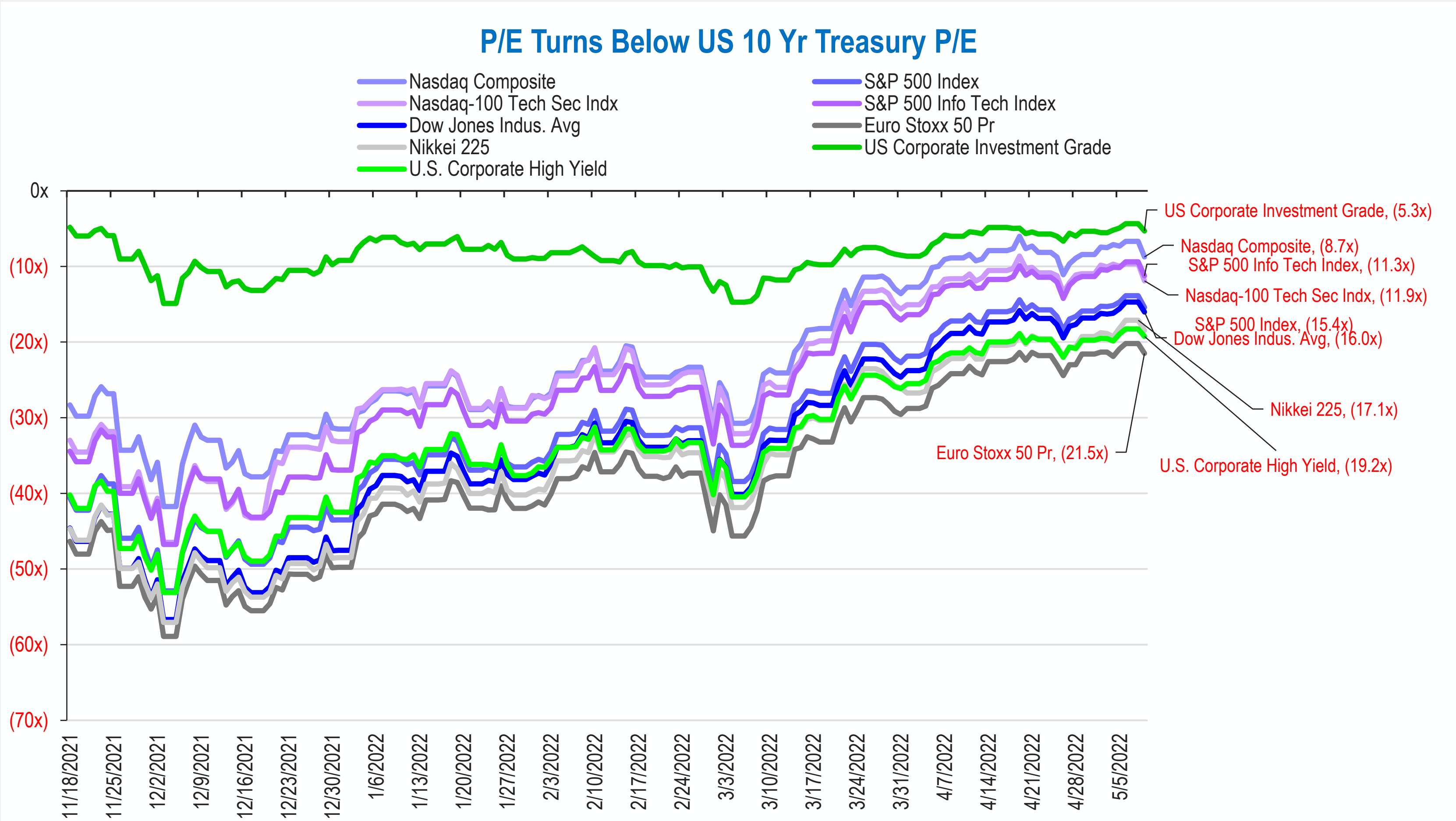


Figure: Asset P/E multiple, turns below US 10 Year P/E Multiple
As of 5/9/2022

Source: BitOoda, Bloomberg

The Dow Has Held its Multiple

Fixed Income Has Derated, Driving Other Assets Down

- The multiple for the Dow Jones Industrial Average is down just 8.4% since 11/18
- Fixed Income multiples have come in 40-50%+ over the same period
- Broader indices, including the S&P and the Nasdaq Composite, and their Tech subindices, are down 25-30%

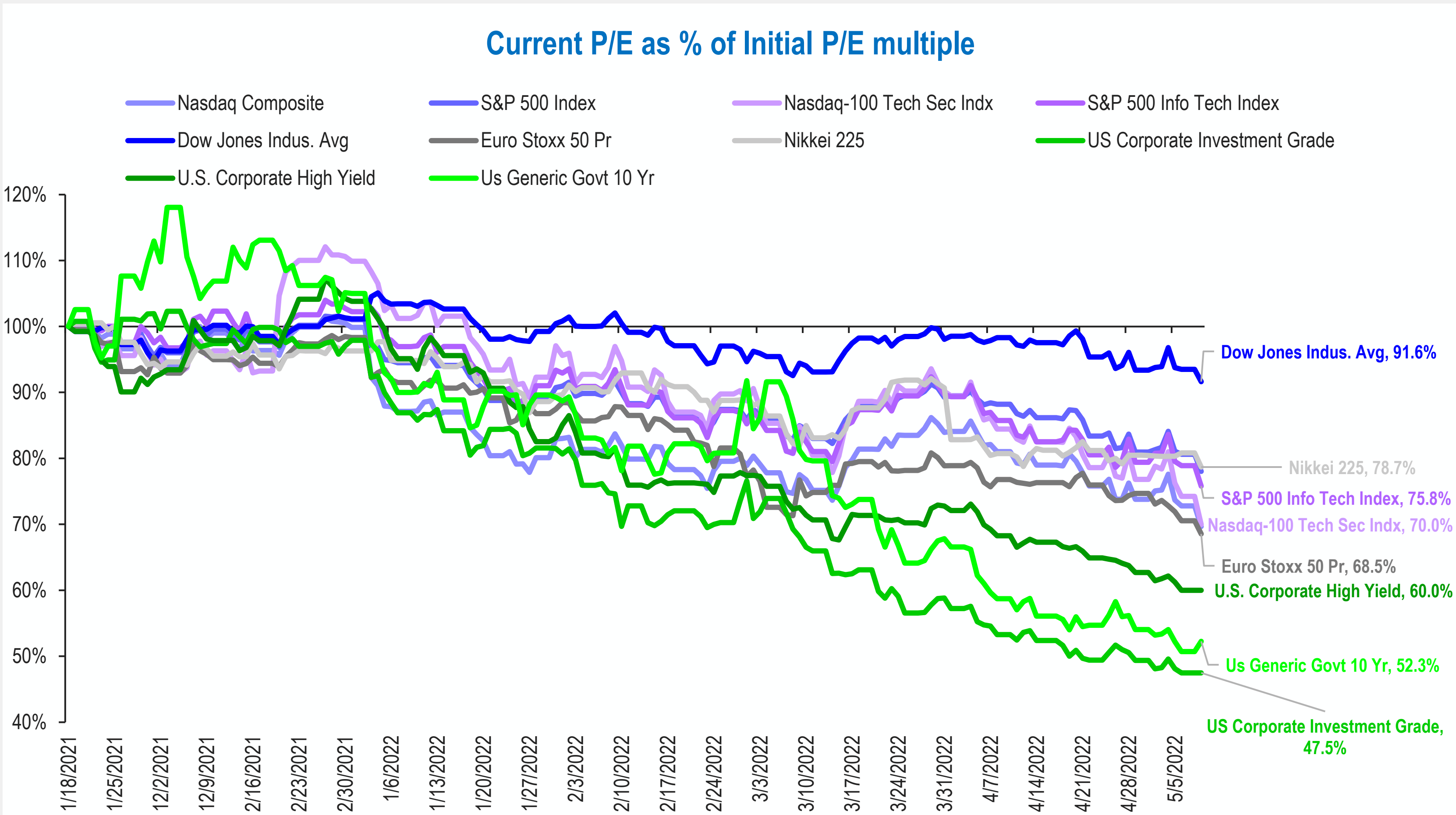


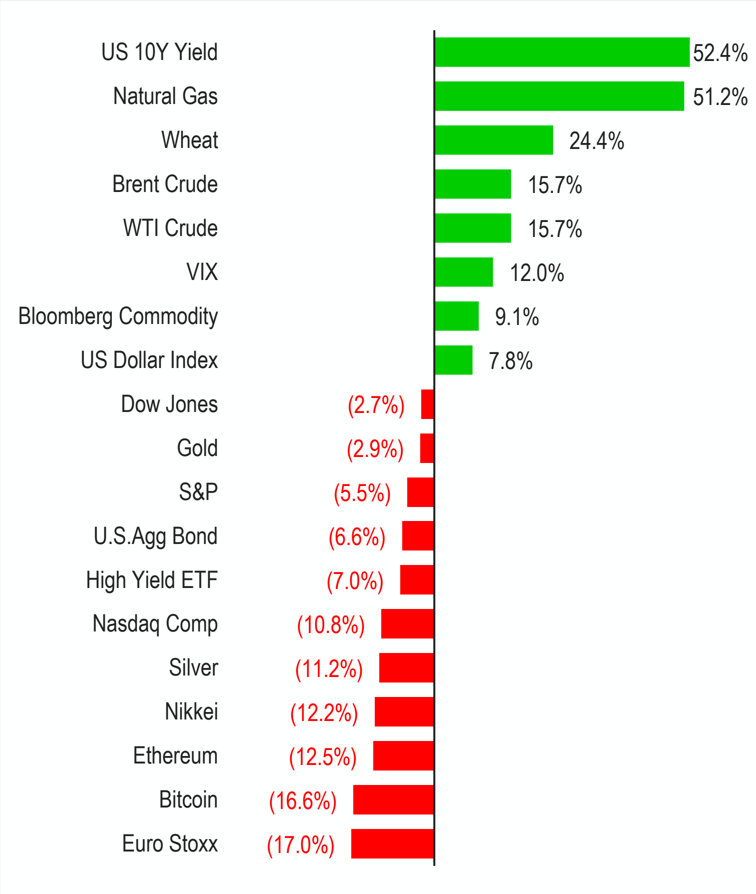
Figure: Current P/E multiple as a percentage of the multiple as of 11/18/21
As of 5/9/2022

Source: BitOoda, Bloomberg

Macro Markets:
Is Crypto Diverging From Equities?

- Since the Russian invasion of Ukraine, equities and corporate bonds have sold off
- So have gold and silver
- Commodities are up a lot with the Dollar and the VIX
- **Interestingly, Bitcoin and Ethereum round out the list of indicators in the green since the invasion**
- **However, they are among the lower performing assets in the past week**

Performance since 2/23



7D Performance as of 5/9

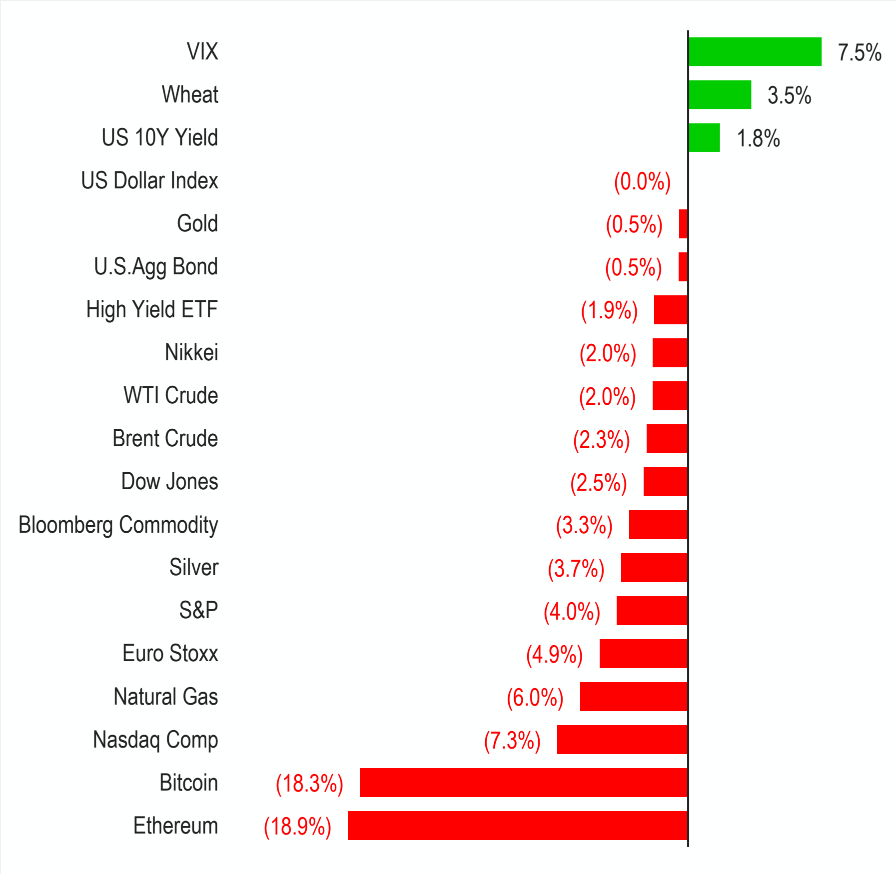


Figure: Macro Indicators: Returns over 7 days, and returns since 2/23, the day before the invasion of Ukraine

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, although we are now in a third bear market for the Nasdaq Composite and the S&P is approaching correction territory
- Bitcoin is only intermittently within 10-20% of all time highs

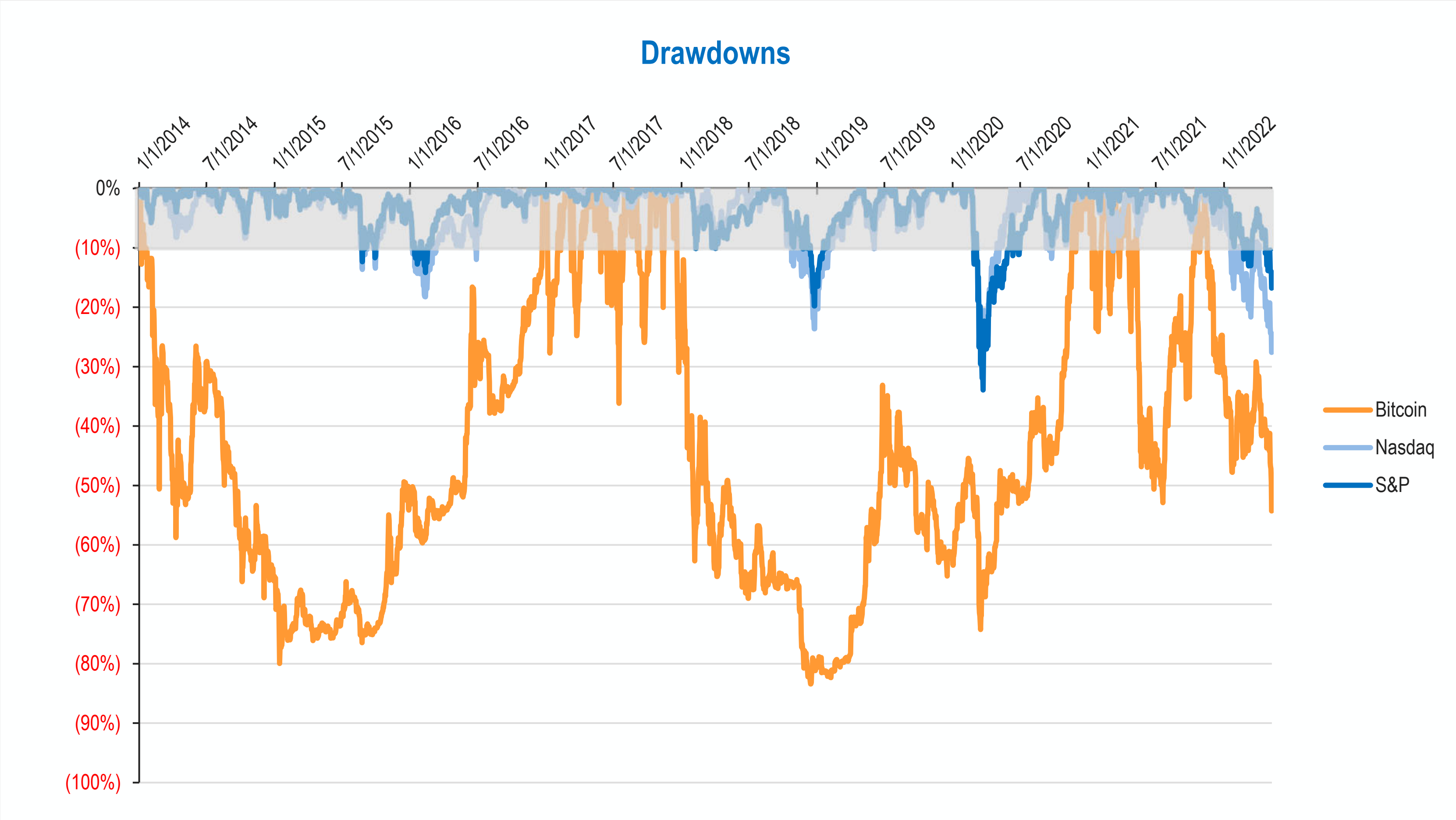


Figure: Drawdowns comparisons: Bitcoin vs the S&P and Nasdaq Composite Since 1/1/2014

Source: BitOoda, Bloomberg

Bitcoin Miners
Performance Map

- Only Cathedra and Ebang have outperformed Bitcoin YTD, but are still down in absolute terms

Year to Date	Quarter to Date	Month to Date	30 Day	7 Day	1 Day
		Cipher, 6.6%			
		Iris Energy, (2.0%)			
		S&P, (3.4%)		Cipher, 1.9%	Cipher, 10.2%
S&P, (16.3%)		Greenidge, (12.0%)		S&P, (4.0%)	Cathedra, (2.0%)
Ebang, (21.6%)	Cipher, (11.3%)	Mawson, (12.5%)	Cipher, (6.6%)	Iris Energy, (5.2%)	S&P, (3.2%)
Cipher, (30.2%)	S&P, (11.9%)	Ebang, (13.1%)	S&P, (11.1%)	Mawson, (12.9%)	Ebang, (6.1%)
Cathedra, (31.1%)	Ebang, (30.4%)	Argo, (17.9%)	Mawson, (19.2%)	Greenidge, (15.6%)	Mawson, (7.2%)
Bitcoin, (32.4%)	Bitcoin, (31.6%)	Bitcoin, (18.3%)	Bitcoin, (26.2%)	Bitcoin, (18.3%)	Bitcoin, (8.5%)
Canaan, (40.6%)	Mawson, (34.1%)	Canaan, (19.5%)	Ebang, (27.2%)	Argo, (20.1%)	Greenidge, (8.8%)
Argo, (47.1%)	Argo, (34.8%)	Hut8, (20.5%)	Argo, (29.1%)	Ebang, (20.8%)	Terawulf, (8.8%)
Iris Energy, (47.3%)	Greenidge, (35.8%)	Hive, (20.5%)	Bitfarms, (31.8%)	Northern Data, (21.1%)	Iris Energy, (10.2%)
Mawson, (49.2%)	Northern Data, (39.4%)	Bit Digital, (20.7%)	Canaan, (35.2%)	Canaan, (21.3%)	Northern Data, (12.4%)
Northern Data, (55.4%)	Bitfarms, (42.1%)	Terawulf, (20.8%)	Greenidge, (35.4%)	Hive, (23.2%)	Core Scientific, (13.2%)
Hive, (56.1%)	Cathedra, (43.2%)	Marathon, (22.6%)	Northern Data, (36.7%)	Hut8, (23.5%)	Argo, (14.7%)
Bitfarms, (57.0%)	Canaan, (43.6%)	Core Scientific, (24.0%)	Hive, (37.3%)	Bit Digital, (24.8%)	Bit Digital, (16.1%)
Core Scientific, (59.0%)	Core Scientific, (45.4%)	Riot, (24.4%)	Cathedra, (37.6%)	Core Scientific, (24.9%)	Hut8, (17.0%)
Marathon, (63.2%)	Hive, (45.5%)	Bitfarms, (24.7%)	Iris Energy, (37.7%)	Cathedra, (26.9%)	Hive, (17.1%)
Digihost, (63.9%)	Iris Energy, (45.6%)	Northern Data, (25.2%)	Hut8, (39.7%)	Terawulf, (27.0%)	Riot, (19.2%)
Hut8, (63.9%)	Hut8, (48.7%)	Cathedra, (28.1%)	Core Scientific, (46.2%)	Marathon, (27.5%)	Marathon, (19.2%)
Greenidge, (65.6%)	Digihost, (50.0%)	Digihost, (35.3%)	Bit Digital, (46.5%)	Bitfarms, (28.1%)	Bitfarms, (19.9%)
Riot, (65.7%)	Bit Digital, (55.3%)	Stronghold, (37.4%)	Marathon, (46.7%)	Riot, (30.1%)	Stronghold, (21.3%)
Bit Digital, (73.5%)	Marathon, (56.8%)		Stronghold, (50.4%)	Digihost, (34.6%)	Canaan, (25.4%)
Terawulf, (80.1%)	Stronghold, (58.3%)		Digihost, (51.3%)	Stronghold, (38.8%)	Digihost, (25.4%)
Stronghold, (81.0%)	Riot, (63.8%)		Riot, (54.0%)		
	Terawulf, (64.3%)		Terawulf, (61.9%)		

Source: BitOoda, Bloomberg

Miner Performance

YTD, Most Underperform BTC

- Bitcoin is off 32% Year to Date
- Only Cathedra, Cipher and Ebang have outperformed Bitcoin so far this year; most miners have significantly underperformed Bitcoin
- This makes sense to us, given the operating deleverage miners should experience on price downside for the underlying

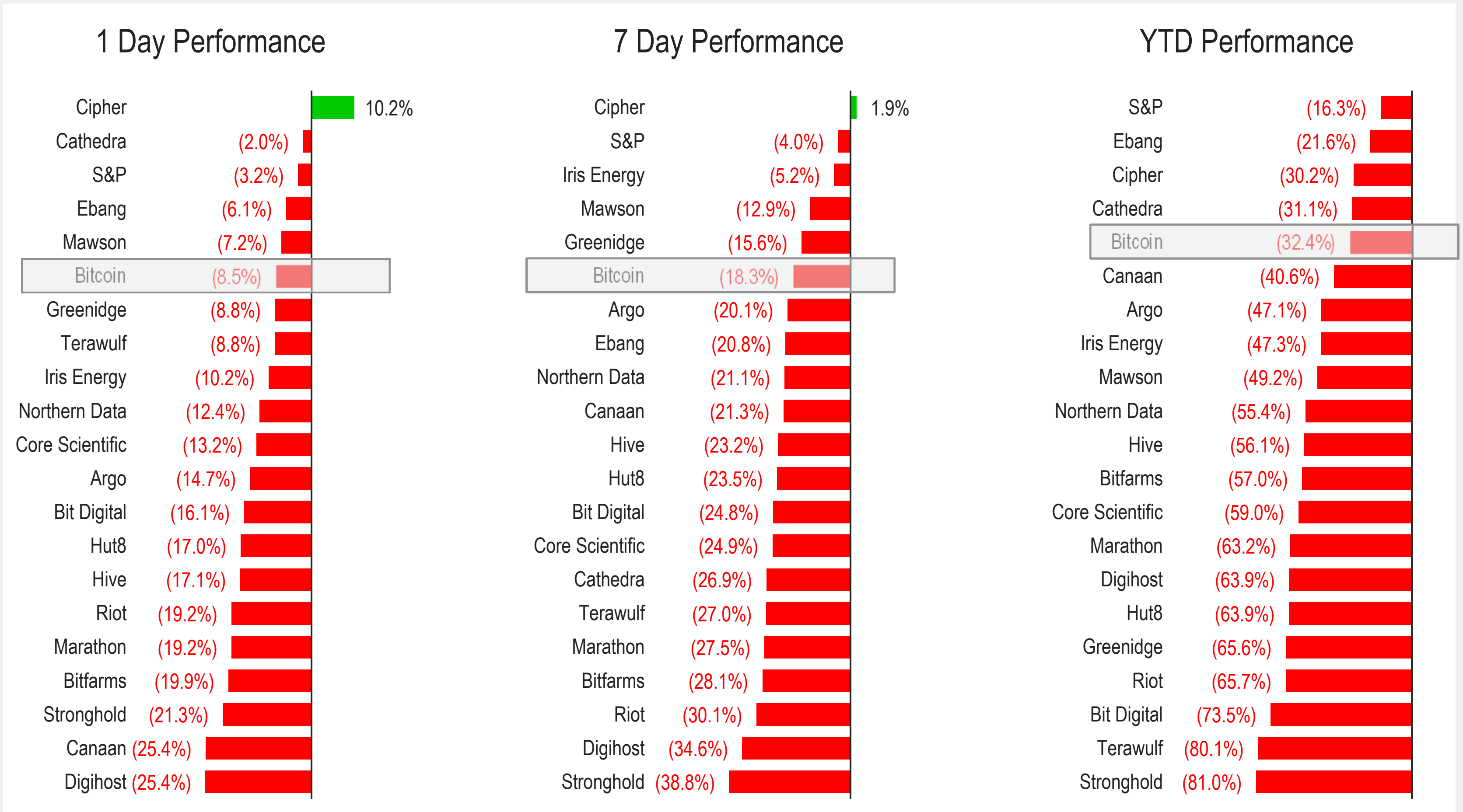


Figure: Bitcoin miner drawdowns

Source: BitOoda, Bloomberg

Drawdowns From BTC Peak
Miners Underperforming Bitcoin

- Bitcoin is off 55% from its peak on November 10, 2021
- Over the same period, the S&P 500 is down 17% and the Nasdaq 28%
- Most miners have underperformed Bitcoin since November 2021 by an average additional 19%

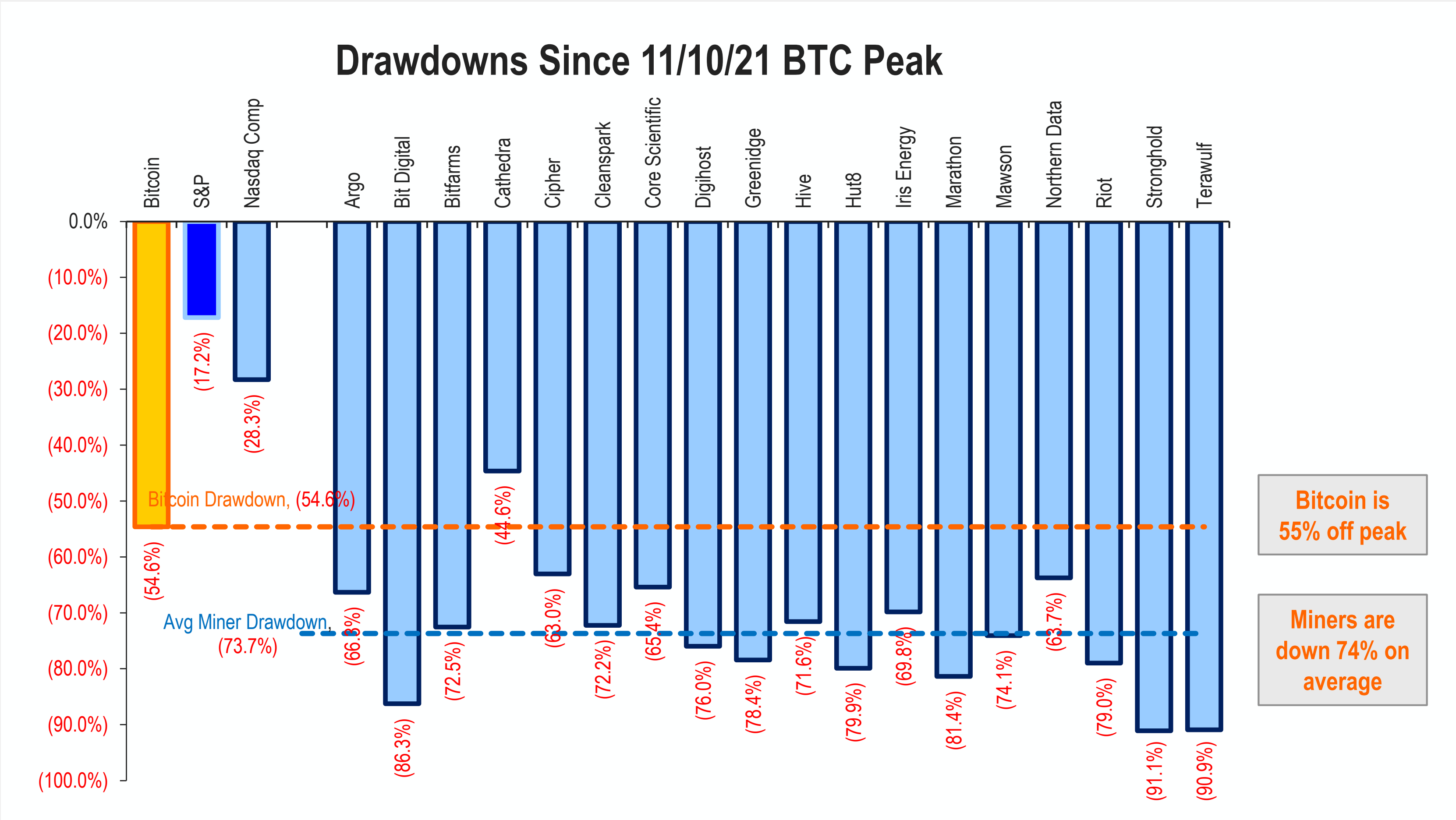


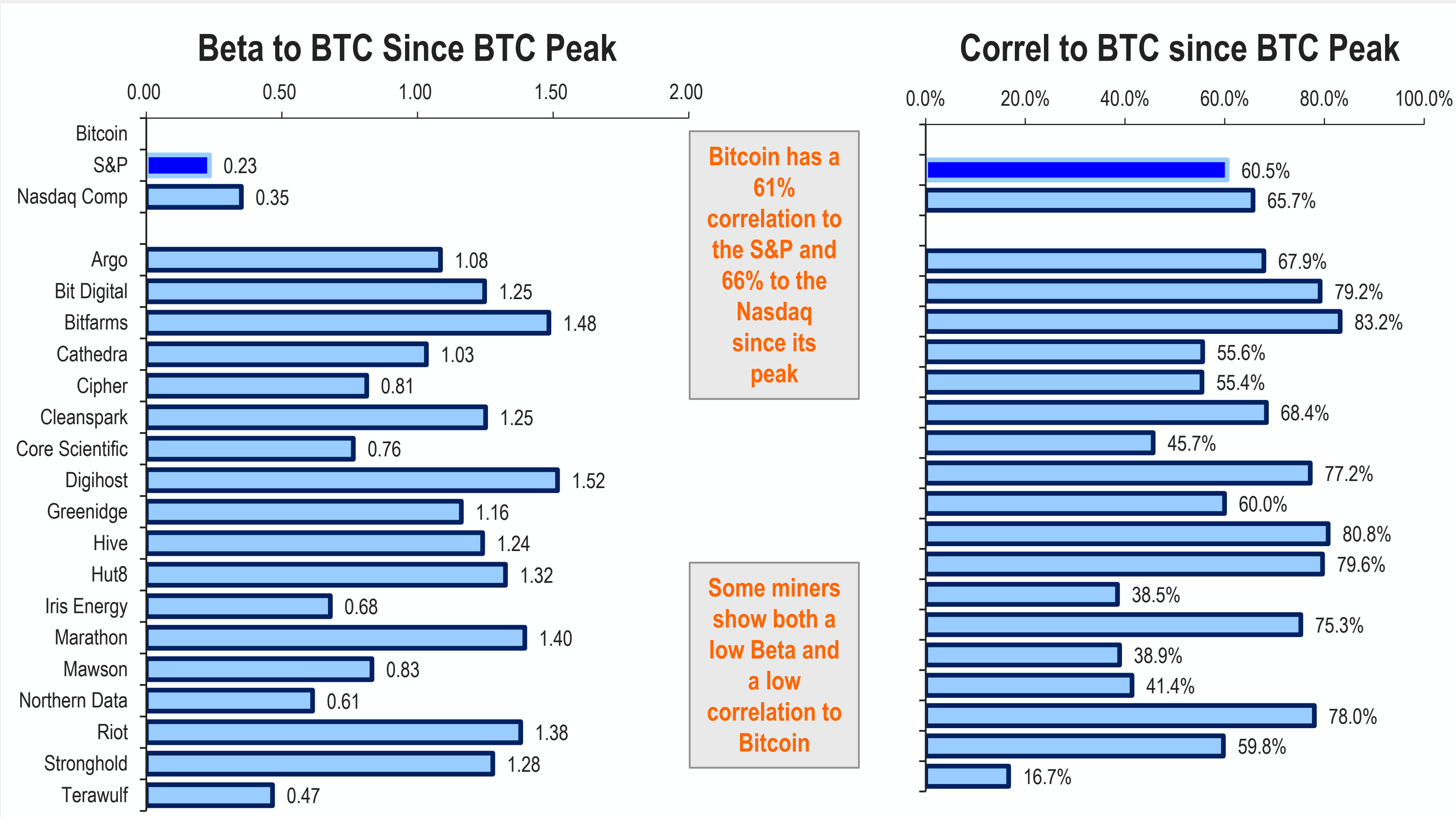
Figure: Bitcoin miner drawdowns

Source: BitOoda, Bloomberg

Notes: 1. Iris Energy's drawdown measured from 11/17/21

Beta & Correlation
Not All Miners Are Equal

- We expect most miners to exhibit a Beta > 1 relative to Bitcoin
- Bitcoin is off 55% 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 61% & 66%, respectively
- **The correlation to equities is picking up to new highs as macro fears affect equity markets**



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