nostiati



Bitcoin performs when macro trend is clear, waiting S&P 500 "breakout Bitcoin Misery Index continues to weaken, waiting for 50 for "buy signal"

It is arguably just our opinion, but we believe Bitcoin generally does not perform well when risk markets have no established trends. Since July, the macro uncertainty created by rising trade tensions caused equity markets to be range-bound and similarly. Bitcoin has stalled.

- BITCOIN NEEDS A CLEAR MACRO TREND (Slide 3). A comparison of Bitcoin's and S&P 500 performance bears this out. In years where S&P 500 has seen gains >15%, Bitcoin averages 1,800% annual gains. When S&P 500 flattish/up <15%, BTC ~300% and when S&P 500 is down, BTC averages declines of 9%. **NOTICE A PATTERN?** When there is a clear trend in risky markets, Bitcoin shines. Granted, this is only 10 years of price history. But as the chart on Slide 4 shows, it is a striking relationship.
- BITCOIN WAITING FOR S&P 500 TO MAKE A NEW HIGH. The implication, in our view, is the S&P 500 needs to break to an all-time high, to reawaken Bitcoin. The all-time high is 3,025 or so. And thus, the S&P 500 is 1% away from achieving this. We expect a 2H19 S&P 500 rally, pushing the index to >3,125.
- BITCOIN MISERY INDEX CONFIRMING THIS, AS IT BROKE DOWN IN MID-JULY. On July 30th, we advised our clients "Bitcoin Misery Index (BMI) below 66...take the rest of summer off" (see Crypto Strategy reported dated 7/30/19) as a confirmed decline in BMI has been associated with weak forward returns—previous to 2019, the BMI saw same dynamic on July 7, 2016 and entered a period of consolidation for 6-8 weeks.
- As a reminder, the BMI is designed to measure what we believe is the current sentiment of a holder of Bitcoin and ranges from 0 to 100. 100=euphoria and 0=misery. At the extremes, it tends to work well as a contrarian indicator (Slide 6), so readings below 27 are a "buy" signal. But when in the middle, it tends to be a coincident indicator.
- STILL WAITING FOR 50 ON THE BMI. Thus, as we discussed in our July 30th report, we are waiting for the BMI to drift downwards towards 50. Since falling below 66 on 7/11/19, it was 61 on 8/1 and as of latest reading 56 (Slide 5). So the BMI is making steady progress towards 50, which is the level where we expect Bitcoin to begin to have better risk/reward (Slide 6). It is a contrarian indicator, at the extremes.
- WHAT COULD GO WRONG? The greatest obstacle for sustained gains in Bitcoin, in our view, is the lack of regulatory protection for Bitcoin in the US. The SEC, while calling BTC a commodity, has not been giving enough assurance to comfort potential institutional investors. Similarly, the White House remains hostile.

Bottom line: Once the S&P 500 breaks to new all-time highs, we see this as bullish for Bitcoin. In other words, those who think Bitcoin only rises when the world is scary is espousing a view not supported by facts. We think Bitcoin will show the best returns once the BMI falls to 50, which could be in the next week or two weeks.

CRYPTO FX STRATEGY

U.S. Portfolio Strategy

Thomas J. Lee, CFAAC 😈

+1 212 293 7131

thomas@fundstrat.com | @fundstrat

Ken Xuan, CFA



+1 212 293 7134 ken.xuan@fundstrat.com | @fundstrat ken

Performance	1Q19	2Q19	3Q19	QTD	YTD
Bitcoin	10%	163%	(6%)	(6%)	170%
FS Crypto 10	9%	127%	(15%)	(15%)	110%
FS Crypto 40	43%	46%	(41%)	(41%)	23%
FS Crypto 50 Eq Wt	41%	46%	(42%)	(42%)	19%
FS Crypto 250	35%	14%	(38%)	(38%)	(5%)
FS Crypto 300	13%	114%	(18%)	(18%)	98%
FS Crypto Agg.	13%	112%	(18%)	(18%)	97%
FS Commodity	12%	157%	(9%)	(9%)	163%
FS Platform	15%	72%	(38%)	(38%)	22%
FS Privacy	21%	53%	(37%)	(37%)	17%
FS Exchange	129%	57%	(32%)	(32%)	145%
FS Stablecoin	(1%)	(1%)	1%	1%	(1%)

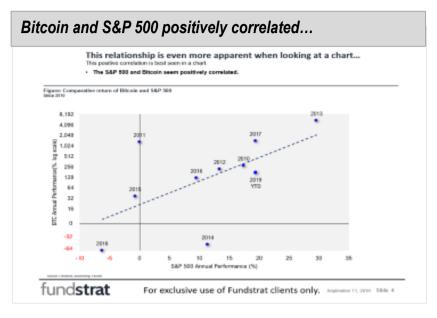
What is the Bitcoin Misery Index (BMI)?

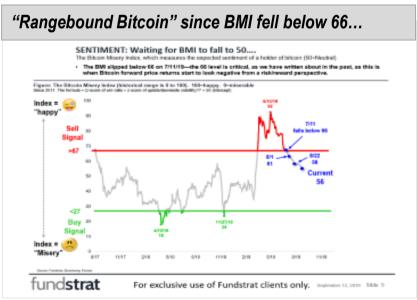
As a reminder, the BMI is designed to measure what we believe is the current sentiment of a holder of Bitcoin and ranges from 0 to 100. 100=euphoria and 0=misery. At the extremes, it tends to work well as a contrarian indicator (Slide 6), so readings below 27 are a "buy" signal. But when in the middle, it tends to be a coincident indicator.

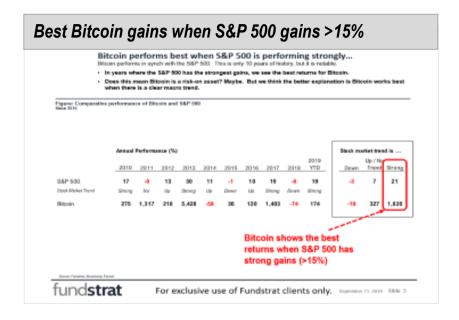
This document is prepared solely for Fundstrat client For inquiries, please contact Sales at 212-293-7140 or via Bloomberg: RESP FSGA <<GO>>

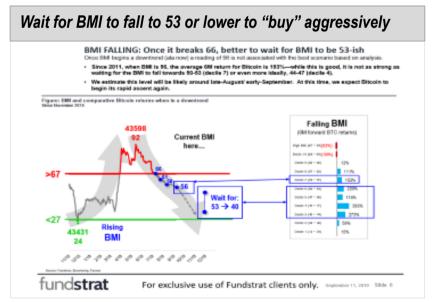
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Key Charts in this report...











Bitcoin performs best when S&P 500 is performing strongly...

Bitcoin performs in synch with the S&P 500. This is only 10 years of history, but it is notable.

- In years where the S&P 500 has the strongest gains, we see the best returns for Bitcoin.
- Does this mean Bitcoin is a risk-on asset? Maybe. But we think the better explanation is Bitcoin works best when there is a clear macro trend.

Figure: Comparative performance of Bitcoin and S&P 500

Since 2010

	Annual Performance (%) 2010 2011 2012 2013 2014 2015 2016 2017 2018 YTD													
	2010	2011	2012	2013	2014	2015	2016	2017	2018					
S&P 500	17	-0	13	30	11	-1	10	19	-6	19				
Stock Market Trend	Strong	No	Up	Strong	Up	Down	Uр	Strong	Down	Strong				
Bitcoin	275	1,317	218	5,428	-58	36	120	1,403	-74	174				

Stock mai			
	Up / Nq		ĺ
Down	Trend	Strong	
-3	7	21	l
-19	327	1,820	

Bitcoin shows the best returns when S&P 500 has strong gains (>15%)

Source: Fundstrat, Bloomberg, Factset



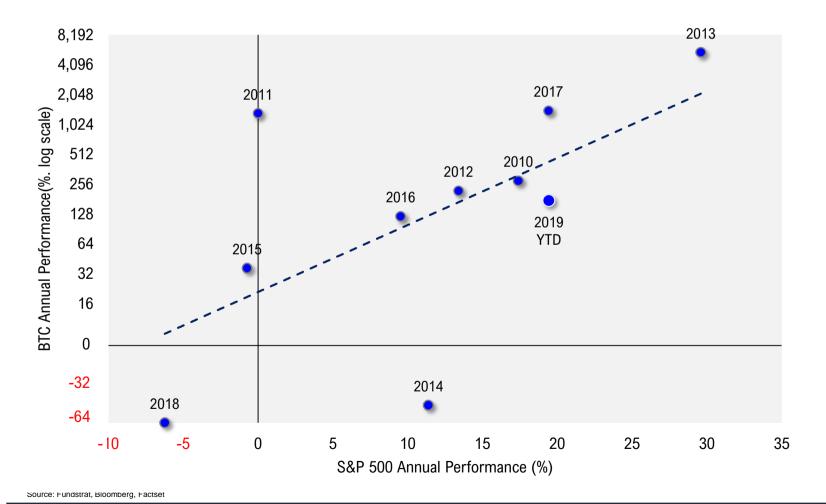
This relationship is even more apparent when looking at a chart...

This positive correlation is best seen in a chart.

• The S&P 500 and Bitcoin seem positively correlated.

Figure: Comparative return of Bitcoin and S&P 500







+1 212 293 7131

SENTIMENT: Waiting for BMI to fall to 50....

The Bitcoin Misery Index, which measures the expected sentiment of a holder of bitcoin (50=Neutral).

• The BMI slipped below 66 on 7/11/19—the 66 level is critical, as we have written about in the past, as this is when Bitcoin forward price returns start to look negative from a risk/reward perspective.

Figure: The Bitcoin Misery Index (historical range is 0 to 100). 100=happy. 0=miserable Since 2011. The formula = (z-score of win-ratio + z-score of upside/downside volatility)*7 + 50 (intercept)





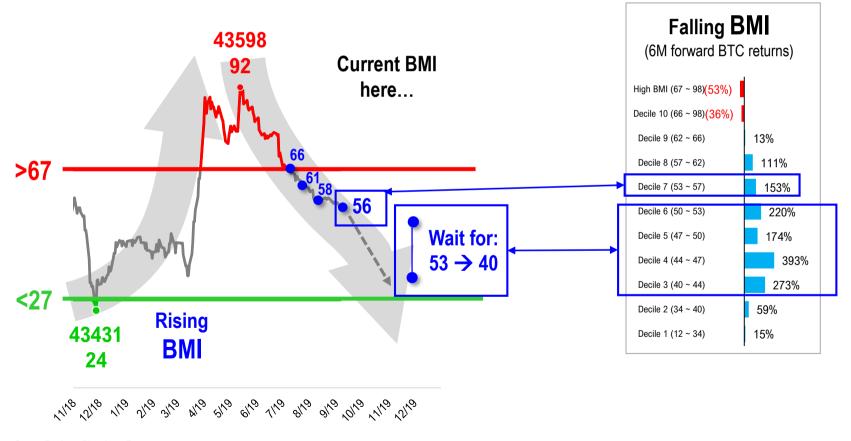


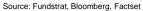
BMI FALLING: Once it breaks 66, better to wait for BMI to be 53-ish

Once BMI begins a downtrend (ala now) a reading of 56 is not associated with the best scenario based on analysis.

- Since 2011, when BMI is 56, the average 6M return for Bitcoin is 153%—while this is good, it is not as strong as waiting for the BMI to fall towards 50-53 (decile 7) or even more ideally, 44-47 (decile 4).
- We estimate this level will be likely around late-August/ early-September. At this time, we expect Bitcoin to begin its rapid ascent again.

Figure: BMI and comparative Bitcoin returns when in a downtrend Since November 2018







1. Nov 2018

13 signs Crypto winter over...

	their mining pools. And while BTC collapse to \$3,200 followed, massive supply gone.
2. December 31, 2018	Grayscale's Bitcoin Investment Trust (OTC: GBTC) sees NAV premium fall to 5%, the lowest since early 2017 and historically marks "capitulation." The premium has since surged to 41%.
3. January 23, 2019	On-chain transactions per day turn positive YoY, the first time since January 2018 (consistently).
4. March 27, 2019	Fundstrat's Bitcoin Misery Index (BMI) crossed above 67 for the first time since August 14, 2017. Since 2015, the BMI has never been >67 in a "Bear market."
5. April 1, 2019	200D cross: Bitcoin closed above 200D. First time since March 2018 (13 months).
6. April 2, 2019	Noted crypto twitter personality @ParabolicTrav (Re-emergence tweet) reappears after a 7 month hiatus.
7. April 18, 2019	Tuur Demeester publishes "Bitcoin in Heavy Accumulation" (Tuur/ Adamant report here) which makes the assertion that HODLer wallets have begun to accumulate Bitcoin.
8. Mid-April	OTC volumes surging. Multiple OTC brokers report that new client activity has surged 60%-70% versus just 4 months ago, and many accounts are re-accumulating bitcoin.
9. Mid-April	On-chain activity surging.
10. April 22, 2019	Willy Woo posts survey of 20-ish Crypto OGs (slang "original gangsters") and even noted bears see high probability Bitcoin has bottomed (survey here)

BTC golden cross. Bitcoin 50D moving average > 200D. Historically bullish.

LOOKBACK: Fork wars of Jihan (BCH) vs Craig Wright (BSV) exhausted "overhang" BTC supply held by

13. May 13-15, 2019

11. April 23, 2019

12. May 1, 2019

Consensus 2019 conference confirmed that crypto winter is over

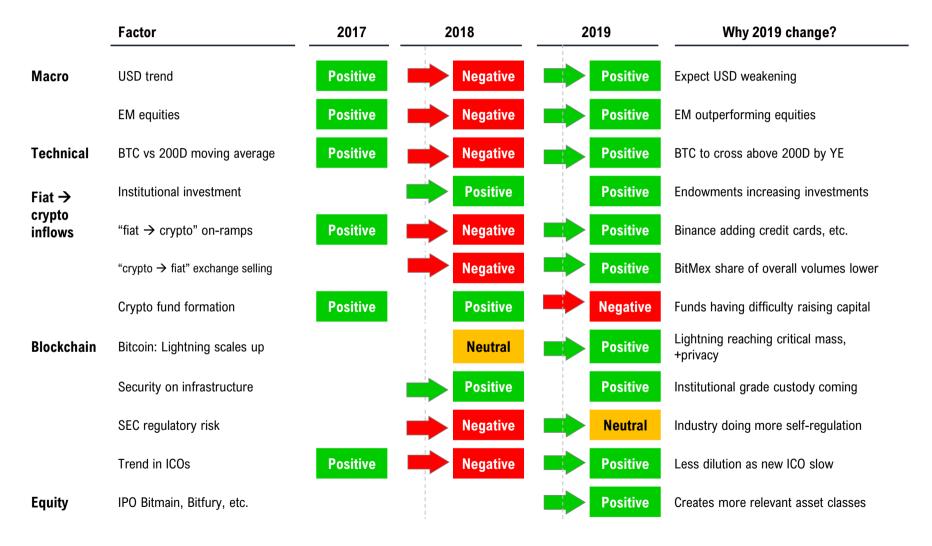
its third party payment processor, Crypto Capital.



Stable market reaction to controversy around Bitfinex/Tether and NY Attorney General's court order alleging undisclosed transfer from Tether's reserves to Bitfinex in order to cover up mishandled funds by

More positive than negative convergences in 2019





Source: Fundstrat, Bloomberg, Coinmarketcap, BitMEX



Overview Performance Recap

TREND

Platform edged up while all other indices traded lower in the past week...

Figure: The Fundstrat Crypto-currency Indices

Fundstrat reference indices.

Index Ticker De	escription	Index	•						
		Price	\$ millions	% share crypto	YTD	Week -3	Week -2	Week -1	Past Week
Sector Indices						8/13/19 to 8/20/19	8/20/19 to 8/27/19	8/27/19 to 9/3/19	9/3/19 to 9/10/19
FS Crypto Commodity FSTOKCTB Lik	kely to be classified as commodities	\$129	\$210,281	69%	163%	(2%)	(5%)	4%	(4%)
FS Crypto Platform FSTOKPLT En	nables decentralized applications	40	\$43,248	14%	22%	(6%)	(3%)	(5%)	0%
FS Crypto Privacy FSTOKPVT To	okens with anonymity features	28	\$3,763	1%	17%	(3%)	(6%)	(6%)	(2%)
FS Crypto Exchange FSTOKDEX To	okens associated with exchanges	112	\$5,106	2%	145%	(4%)	(8%)	(12%)	(2%)
FS Crypto Stablecoin FSTOKSTB Tra	racks the fiat currencies	100	\$4,422	1%	(1%)	0%	(0%)	0%	(0%)
Market-Cap based Indices									
FS Crypto 10 FSTOK10 To	op 10 largest Crypto-currencies	\$149	\$272,625	90%	110%	(3%)	(5%)	2%	(4%)
FS Crypto 40 FSTOK40 To	op 11-50 based on market value	62	\$18,608	6%	23%	(5%)	(3%)	(7%)	(3%)
FS Crypto 50 Eq Wt FSTOKEQW Eq	qual weighted FS Crypto 10 and 40	60	\$291,233	96%	19%	(7%)	(5%)	(6%)	(4%)
FS Crypto 250 FSTOK250 To	op 51-300 based on market cap	35	\$10,101	3%	(5%)	(4%)	(1%)	(6%)	(3%)
FS Crypto 300 FSTOK300 FS	S Crypto 10, 40 and 250	132	\$301,335	99%	98%	(3%)	(5%)	2%	(4%)
FS Crypto Aggregate FSTOKAGG Ag	ggregate index	131	\$303,652	100%	97%	(3%)	(5%)	2%	(4%)

Source: Fundstrat, Bloomberg. * Base date of Cap based Indices is 9/30/17 and Sector Indices is 3/31/18



SECTORS: FS Crypto Commodity & Exchange Quantitatively ranked

Figure: Comparative Quantitative Score for tokens in OW-rated Platforms and Commodity Sectors

undstrat						Technical M	letrics								
Name	Symbol	Price (USD)	Price (BTC)	Market Cap (\$B)	Current Coin Supply	Composite Technical Score	90D Win Ratio		Price to	Relative Price to 50 DMA	Weekly RSI	5D Return	10D Return	30D Return	21 vs 50
Commodity In	dex Cons	tituents													
Litecoin	LTC	\$70.82	0.007001	4.5	63,230,647	1	47	(0)	102.2%	88.6%	43	8.3	9.7	(21.1)	13.6%
Bitcoin Cash	ВСН	\$304.13	0.030064	5.5	17,996,417	2	53	(32)	101.9%	97.6%	47	3.8	8.6	(9.5)	4.3%
Bitcoin	BTC	\$10,115.98	1.000000	181.4	17,928,143	3	54	(9)	99.4%	97.0%	57	(4.3)	5.0	(12.2)	2.4%
Monero	XMR	\$72.23	0.007140	1.2	17,201,690	4	46	(8)	95.6%	88.8%	46	(4.9)	6.9	(21.7)	6.7%
Dogecoin	DOGE	\$0.00	0.000000	0.3	121,142,702,503	5	48	21	94.8%	89.0%	42	(3.7)	(2.9)	(15.9)	5.8%
Zcash	ZEC	\$45.08	0.004456	0.3	7,386,994	6	41	(8)	94.9%	80.8%	36	0.4	0.7	(24.8)	14.1%
Decred	DCR	\$22.92	0.002266	0.2	10,367,981	7	43	(5)	94.5%	88.4%	43	(7.2)	0.2	(17.6)	6.1%
Bytecoin	BCN	\$0.00	0.000000	0.1	184,010,422,131	8	46	15	88.9%	82.2%	31	(5.4)	(13.9)	(24.5)	6.7%
Exchange Ind	ex Consti	tuents													
AirSwap	AST	\$0.03	0.000003	0.0	149,997,688	1	41	42	106.7%	90.5%	41	23.4	12.4	(5.0)	16.2%
Kyber Network	KNC	\$0.19	0.000019	0.0	168,152,083	2	48	(8)	108.8%	108.6%	44	5.5	16.4	13.9	0.2%
Huobi Token	HT	\$4.10	0.000405	1.0	245,925,360	3	48	2	96.4%	89.3%	58	3.0	5.7	(19.3)	7.1%
Bancor	BNT	\$0.36	0.000035	0.0	62,706,340	4	47	(39)	98.2%	86.0%	31	4.1	(0.2)	(21.1)	12.2%
QASH	QASH	\$0.09	0.000009	0.0	349,999,519	5	46	(2)	97.3%	89.1%	39	5.4	(1.5)	(12.4)	8.3%
0x	ZRX	\$0.16	0.000016	0.1	600,719,876	6	42	(8)	95.8%	85.7%	31	0.9	(1.0)	(16.9)	10.1%
	BNB	\$21.91	0.002166	3.4	155,544,834	7	42	(7)	92.5%	82.7%	45	(3.7)	3.0	(27.1)	9.7%

Source: Fundstrat, Bloomberg, Onchainfx.com



+1 212 293 7131

thomas@fundstrat.com

SECTORS: FS Crypto Platform & Privacy Quantitatively ranked

Figure: Comparative Quantitative Score for tokens in OW-rated Privacy and Exchange Sectors

Name	Sumbol	Price (USD)	Drice (PTC)	Market Cap		Composite Technical Score	90D Win Ratio U			Relative Price to DMA	Weekly RSI	5D Return	10D Return	30D Return	21 vs 50 DMA
Platform Index	Symbol Constitue		Price (BTC)	(\$B)	Coin Supply	Score	Ratio U	V - DV	DIVIA	DIVIA	KOI	Return	Return	Return	DIVIA
EOS	EOS	\$3.78	0.000374	3.5	930,904,256	1	46	(27)	108.7%	98.2%	44	15.2	13.5	(9.8)	10.5%
Ontology	ONT	\$0.76	0.000075	0.4	533,369,306	2	44	(9)	102.1%	90.2%	41	7.4	6.5	(15.6)	11.9%
Ethereum	ETH	\$179.79	0.017773	19.4	107,688,284	3	52	(31)	99.8%	90.9%	43	3.2	4.2	(16.8)	8.9%
Cardano	ADA	\$0.05	0.000005	1.2	25,926,799,570	4	52	(19)	99.3%	90.7%	39	4.7	3.4	(15.4)	8.6%
Ethereum Classic	ETC	\$6.53	0.000646	0.7	113,340,131	5	48	(11)	97.3%	104.9%	49	(7.5)	3.8	12.2	(7.6%)
NEO	NEO	\$8.87	0.000877	0.6	70,563,874	6	49	15	95.8%	86.4%	40	(1.6)	0.6	(20.0)	9.4%
Bytom	BTM	\$0.08	0.00008	0.1	1,002,494,450	7	47	(14)	95.2%	81.5%	39	1.0	(2.4)	(23.7)	13.8%
IOTA	MIOTA	\$0.24	0.000024	0.7	2,779,530,659	8	42	(18)	95.8%	90.8%	38	(1.5)	(3.4)	(11.3)	5.0%
VeChain	VET	\$0.00	0.000000	0.2	55,460,901,770	9	41	40	92.2%	81.5%	36	(0.7)	(5.3)	(24.0)	10.7%
Qtum	QTUM	\$2.03	0.000201	0.2	95,832,915	10	47	13	90.6%	79.1%	40	0.5	(3.8)	(26.7)	11.5%
Stratis	STRAT	\$0.36	0.000036	0.0	99,480,810	11	46	(19)	92.6%	82.4%	31	(6.6)	(8.7)	(17.1)	10.2%
Stellar	XLM	\$0.06	0.00006	1.2	19,749,053,895	12	42	(2)	91.2%	80.7%	29	(3.5)	(7.2)	(25.0)	10.5%
Waves	WAVES	\$1.04	0.000103	0.1	100,291,539	13	37	(5)	89.6%	82.7%	28	(7.1)	(6.3)	(21.2)	6.8%
Lisk	LSK	\$1.00	0.000099	0.1	120,428,661	14	36	35	89.1%	79.5%	35	(3.8)	(9.1)	(22.5)	9.6%
NEM	XEM	\$0.04	0.000004	0.4	8,999,973,099	15	50	(11)	88.4%	78.9%	36	(7.6)	(7.7)	(25.5)	9.6%
Privacy Index	Constituer	its													
Dash	DASH	\$83.83	0.008287	0.8	9,032,081	1	41	(19)	97.9%	86.8%	37	4.0	4.5	(21.6)	11.1%
Monero	XMR	\$72.23	0.007140	1.2	17,201,690	2	46	(8)	95.6%	88.8%	46	(4.9)	6.9	(21.7)	6.7%
Bitcoin Private	ВТСР	\$0.25	0.000024	0.0	4,740,355	3	48	951	103.2%	85.9%	37	(14.3)	(28.6)	(11.3)	17.3%
Zcash	ZEC	\$45.08	0.004456	0.3	7,386,994	4	41	(8)	94.9%	80.8%	36	0.4	0.7	(24.8)	14.1%
Bytecoin urce: Fundstrat, Blooml	BCN	\$0.00	0.000000	0.1	184,010,422,131	5	46	15	88.9%	82.2%	31	(5.4)	(13.9)	(24.5)	6.7%



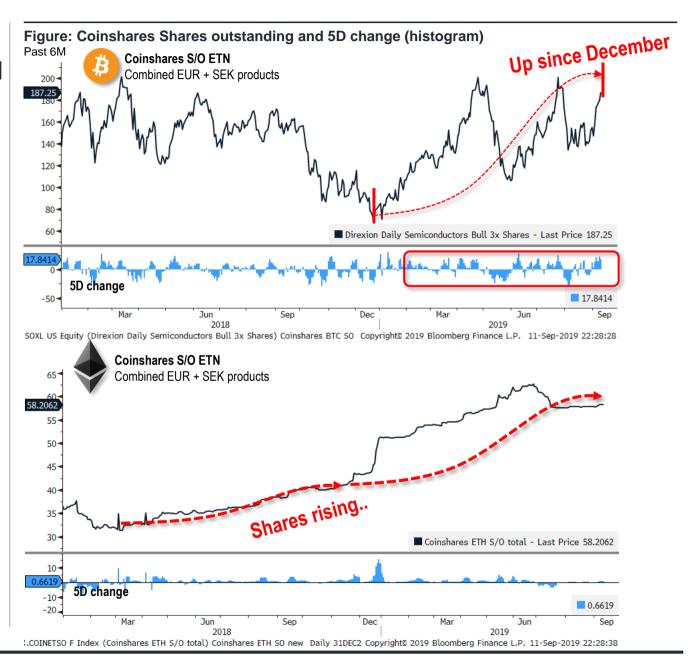
Big Money Coinshares S/O trend

TREND

Big money buying BTC

One proxy for Big money is the S/O of Coinshares ETF S/O... both for BTC and Eth.

Big money buying BTC has recovered since the December low



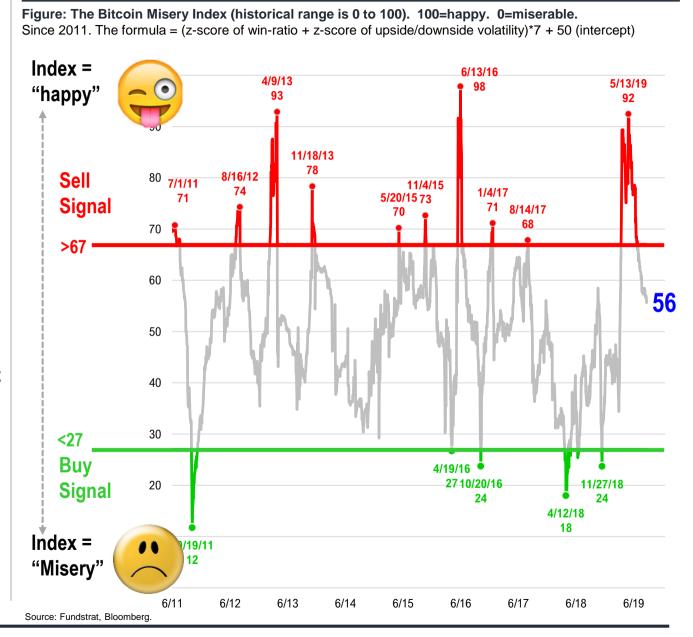


SentimentBitcoin Misery Index

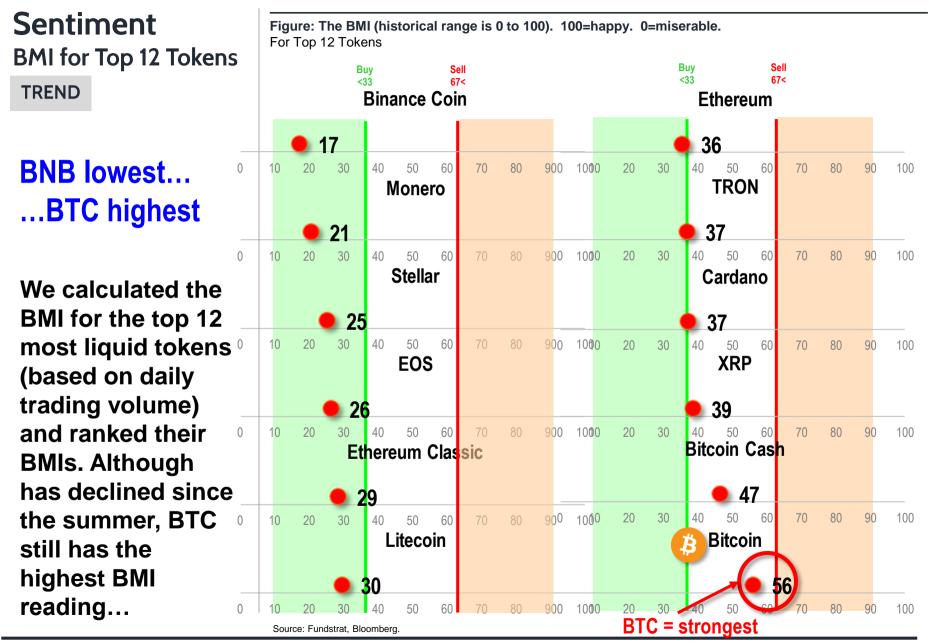
TREND

Bitcoin Misery Index @ 56

The bitcoin misery index, which measures the expected sentiment of a holder of bitcoin (50=Neutral) has recently declined to 56.







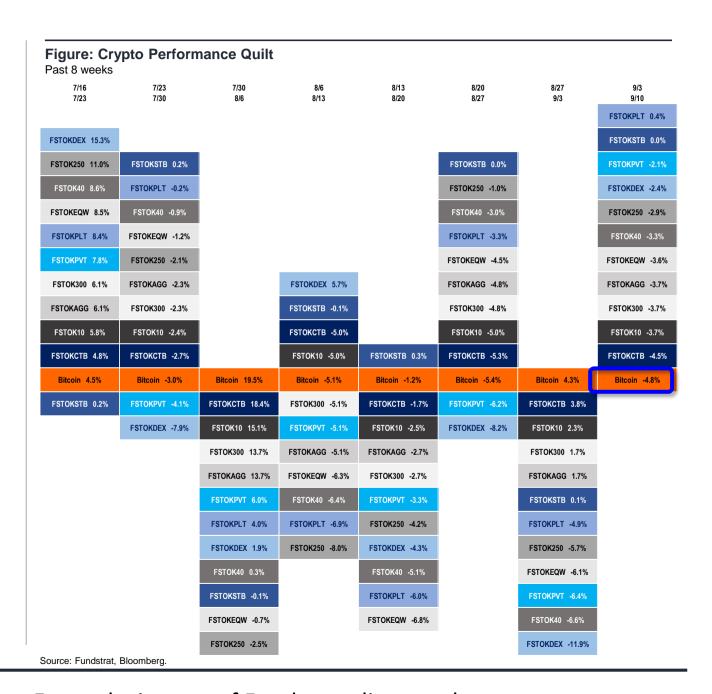


Overview Leadership

TREND

Crypto markets were broadly down. BTC has been the laggard in the past week

• • • •



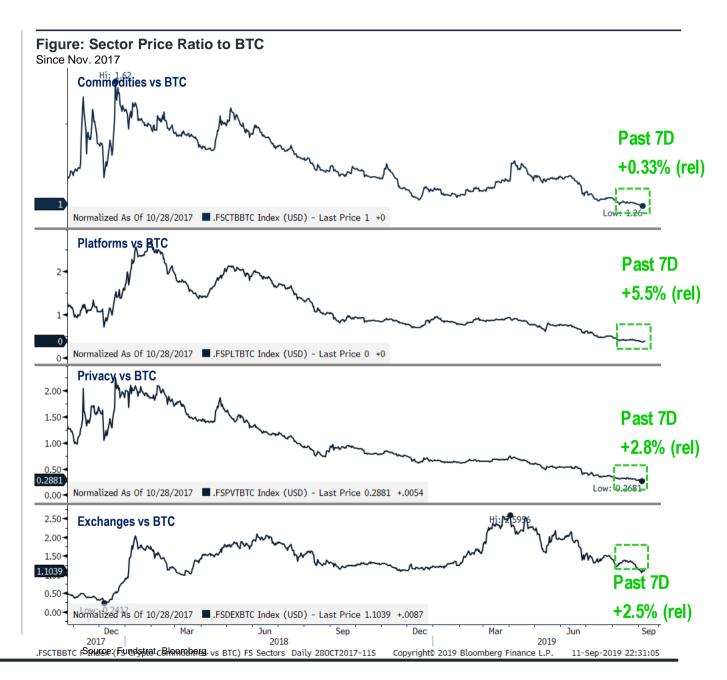


Sectors vs BTC

TREND

All sectors outperformed BTC

Platform index outperformed BTC the most primary due to the rally in EOS price (Slide 20)...





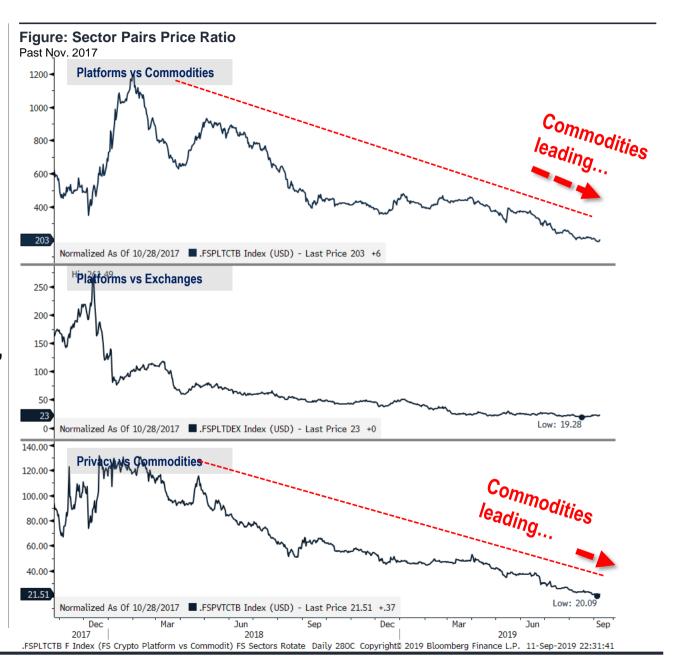
Sector Rotation Sector Pairs

TREND

Still stick with Commodities

We continue to favor Commodities, generally, as we see this as the least likely to face regulatory risks.

And also, commodity tokens like BTC, ZEC, LTC, BCH are thus easier to implement to payment systems, etc.

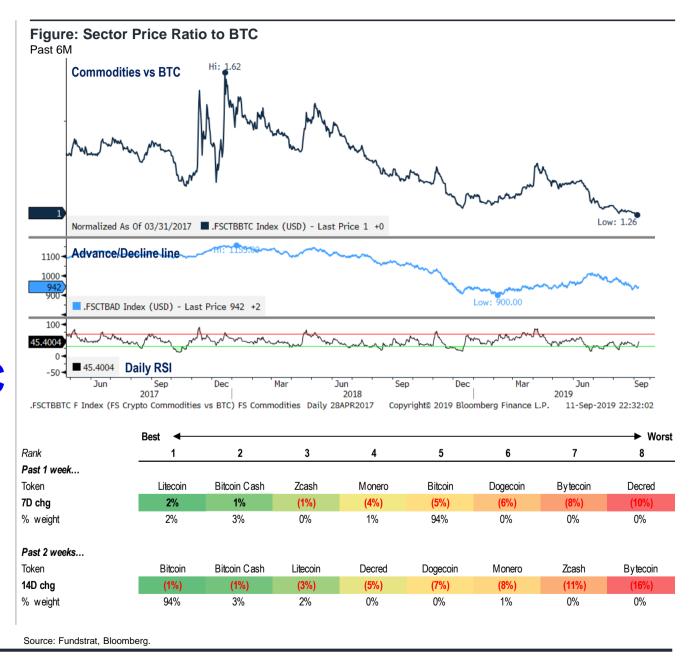




Sectors Commodities

TREND

Only Litecoin and Bitcoin Cash were up last week. BTC gave up 5%...

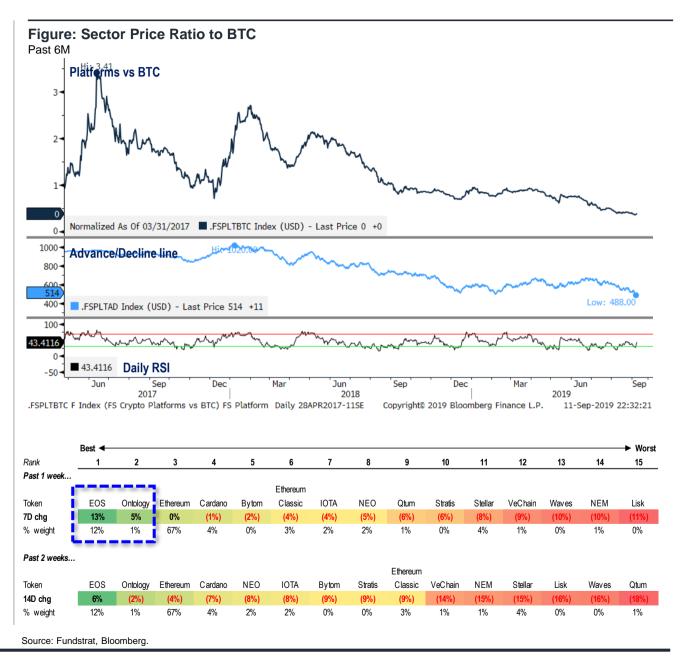


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Sectors Platforms

TREND

Platform was the best performing sector in the past week due to EOS's 13% returns (vs.-4% for the entire crypto market measured by FS Crypto Agg Index)....



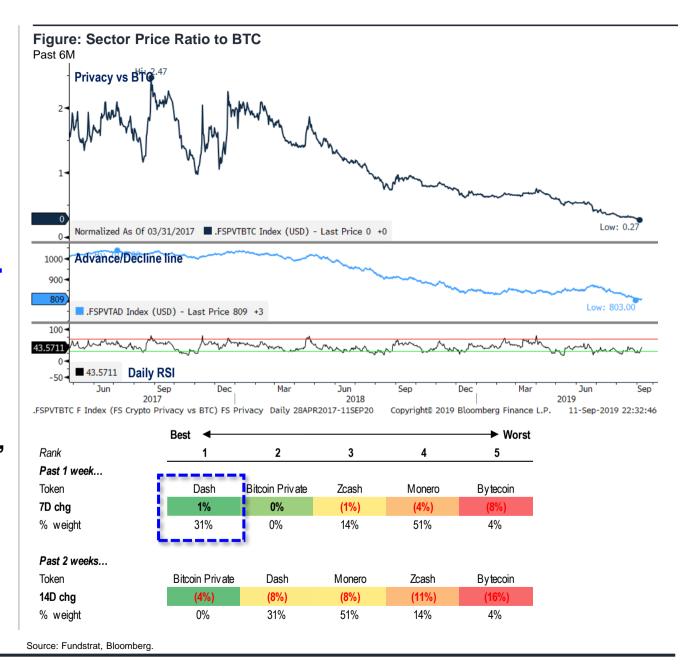


Sectors Privacy

TREND

Privacy tokens mixed last week...

Although Dash and Bitcoin Private edged up last week, Monero's underperformance dragged down the sector...





TOKENS: The 15 most Quantitatively Attractive of Top 50 largest

Figure: Comparative Quantitative Score for tokens in OW-rated Platforms and Commodity Sectors

Per Fundstrat Technical Metrics

		Price		Market		Composite Technical	90D Win	000		Relative Price to	Weekly	5D	10D	200	21 vs 50
Name	Symbol	(USD)	Price (BTC)		Coin Supply					50 DMA	RSI	Return	Return	Return	DMA
EOS	EOS	\$3.78	0.000374	3.9	1,018,673,511	1	46	(27)	108.7%	98.2%	44	15.2	13.5	(9.8)	10.5%
Litecoin	LTC	\$70.82	0.007001	4.4	62,531,466	2	47	(0)	102.2%	88.6%	43	8.3	9.7	(21.1)	13.6%
Augur	REP	\$10.30	0.001018	0.1	11,000,000	3	39	22	109.2%	99.8%	39	12.9	28.6	(6.8)	9.5%
Holo	НОТ	\$0.00	0.000000	0.2	177,619,433,541	4	41	(3)	103.4%	91.1%	40	4.4	5.8	(12.8)	12.2%
Ontology	ONT	\$0.76	0.000075	0.8	1,000,000,000	5	44	(9)	102.1%	90.2%	41	7.4	6.5	(15.6)	11.9%
BitTorrent	BTT	\$0.00	0.000000	0.6	990,000,000,000	6	41	(9)	100.1%	85.2%	42	10.5	7.8	(19.5)	14.9%
KuCoin Shares	KCS	\$1.54	0.000152	0.3	179,659,415	7	46	22	101.8%	97.4%	54	(0.6)	12.4	(12.0)	4.4%
Bitcoin Cash	всн	\$304.13	0.030064	5.4	17,875,275	8	53	(32)	101.9%	97.6%	47	3.8	8.6	(9.5)	4.3%
Ethereum	ETH	\$179.79	0.017773	19.2	106,775,110	9	52	(31)	99.8%	90.9%	43	3.2	4.2	(16.8)	8.9%
Huobi Token	НТ	\$4.10	0.000405	2.1	500,000,000	10	48	2	96.4%	89.3%	58	3.0	5.7	(19.3)	7.1%
Cardano	ADA	\$0.05	0.000005	1.4	31,112,483,745	11	52	(19)	99.3%	90.7%	39	4.7	3.4	(15.4)	8.6%
Bitcoin	BTC	\$10,115.98	1.000000	180.1	17,800,150	12	54	(9)	99.4%	97.0%	57	(4.3)	5.0	(12.2)	2.4%
Ethereum Classic	ETC	\$6.53	0.000646	0.7	111,724,084	13	48	(11)	97.3%	104.9%	49	(7.5)	3.8	12.2	(7.6%
ICON	ICX	\$0.20	0.000020	0.2	800,460,000	14	42	22	95.9%	90.3%	38	3.9	(0.5)	(0.3)	5.6%
Dash at, Bloomberg, Onchainf	DASH x.com	\$83.83	0.008287	0.7	8,906,414	15	41	(19)	97.9%	86.8%	37	4.0	4.5	(21.6)	11.1%



Research team



Thomas J. Lee, CFA Co-Founder, Head of Research In research: 26 years

Prior to founding Fundstrat, Mr. Lee was at J.P. Morgan from 1999 to 2014 and served as Chief Equity Strategist from 2007 to 2014. He was topranked by Institutional Investor every year since 1998. Previously served as Managing Director at Salomon Smith Barney. Mr. Lee graduated from the undergraduate program at the Wharton School, University of Pennsylvania.



L. Thomas Block
Washington and Policy Strategist
Head of JPM policy: 22 years

Tom had a 21-year career at J.P. Morgan, serving as Global Head of Government Relations. Prior to joining JP Morgan Chase in 1987, he previously worked in Washington and held several positions with members of the House and Senate, serving as Legislative Assistant and Chief of Staff in the House, and Legislative Staff Director in the Senate



Rob Sluymer, CFA Head of Technical Analysis Strategy In research: 27 years

Head of Technical Research with over 26 years experience writing technical research at RBC Capital Markets.



Vito J. Racanelli Senior Editor & Market Intelligence Analyst Senior Editor: 20 years

Previously a reporter with Dow Jones Professional Investor Report in 1990, moved to AP-Dow Jones in Italy and later Barron's in NY, where he was a senior editor for 20 years.



Ken Xuan, CFA, FRM Head of Data Science Research In research: 5 years

Data scientist with expertise in applied mathematics and statistical analysis. Ken was an operations strategy consultant at West Monroe Partners. Ken received a B.S. in Management, Economics from Purdue University in 2013 and an M.S. in Operations Research from Columbia University in 2017.



Alex Kern Research Analyst In research: 4 years

Previously a Research Analyst with Digital Currency Group. Prior to that, Alex was a Fintech and Payments Equity Research Associate with Cowen & Co. Alex received his B.A. in History from the University of Pennsylvania in 2014.

Source: Fundstrat, Bloomberg, Factset



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Thomas J. Lee, the research analyst denoted by an "AC" on the cover of this report, hereby certifies that all of the views expressed in this report accurately reflect his personal views, which have not been influenced by considerations of the firm's business or client relationships.

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