THRASHER

JULY 21, 2024



WEEKLY RESEARCH & ANALYSIS

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SUMMARY OF MODELS

	Current	Wkly Change
Maestro Model	9	Increasing
Volatility Risk Trigger	0	Decreasing
Risk Appetite Ratios	51	Decreasing
S&P 500 Long-Term Trend	Up	Unchaged

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Volatility

Sector Sentiment

Maestro Model

Equities

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Sentiment

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MARKET DASHBOARD



Sector Rotatio	n: July
Technology	XLK
Utilities	XLU
Communications	XLC

Maestro Mo	odel
Trend / Momentum	6
Sentiment / VIX	0
Breadth	0
Economic	3
Total	9

1	Breadth	i	weighted	double	in	model)	١
٠,	W1	***				ALLOWED)	7

Inde	x & Se	ctor
	Up	Down
	Trend	Trend
SPX	X	
QQQ	X	
XLF	X	
XLY	X	
XLK	X	
XLV	X	
XLU	X	
XLP	X	
XLI	X	
XLRE	X	
XLE	X	
XLB	X	

Daily S	entiment In	dex
	% Bullish	5-day MA
S&P 500	62%	75%
Nasdaq 100	62%	74%
Nikkei	46%	57%
VIX	40%	28%
10yr Treasury	57%	66%
5yr Treasury	66%	69%
CRB Index	63%	71%
Crude Oil	62%	67%
Gold	65%	76%
U.S. Dollar	41%	35%
Bitcoin	50%	45%

^{*}Green<25% Red>80%

source: trade-futures.com

Brief Summary:

Weakness has now entered the market, taking the S&P 500 down -2.86% from its high with the Dow down a little over -2% and other major foreign markets like the DAX off -3.7% and FTSE 100 -3.43%. The momentum factor was the worst performer, down -4.15% last week with value up +0.68%. I've been writing about the expectation of the VIX moving higher with 3 VRT signals in recent weeks. Last week we got a 3-sigma event in the VIX, the first in several months.

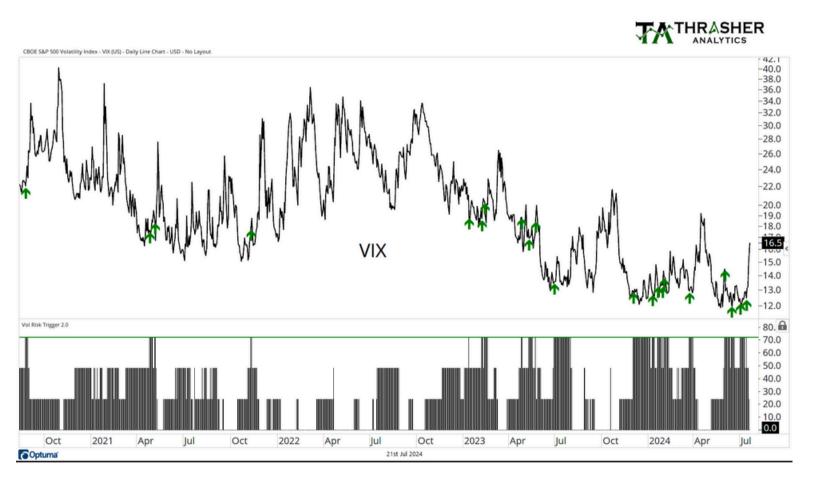
While we've yet to see major shifts in the breadth data as the S&P 500 closed under the 20-day moving average, the decline was led by the Mag 7 just as they had led on the way up. NVDA is down -13%, MSFT -6.5%, AMZN -8.4%, GOOGL -7%, and AAPL -4.48%. Google, Tesla, and Visa are three notable companies reporting Q2 earnings this week with Amazon, Facebook, and Microsoft all reporting next week.

While large caps struggled, small caps saw a massive outperformance. Some commentators noted this to be the rotation the market needs. However, the big caveat here is the massive weighting the mega caps have in the market right now. Previously when things were a little more balanced, we could have rotation and still see a healthy up trend, but with six largest (MSFT, AAPL, NVDA, META, and GOOGL) accounting for over 30% of the S&P 500, we can't see these stocks breakdown and not have a major impact on the trend of the overall market - regardless of what the Russell 2000 does. We saw big periods of outperformance in small caps in 2000 and 2007 too, that didn't lead to big rotation in a healthy up trend. I don't share that to suggest we are repeating those periods but to note that it doesn't always equate to healthy "rotation."

VOLATILITY: VRT



We've now had a material rise in the VIX, seeing it rise above 17 intraday on Friday. The Three VRT signals we recently received, marked the lows in volatility.



VOLATILITY: TOP & ENVIRONMENT



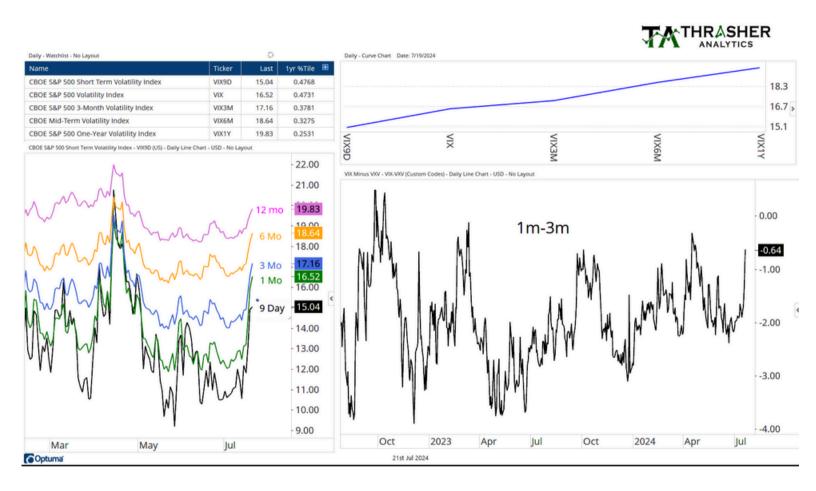
VIX moved to a High Volatility Environment on Friday (bad low print on the chart, ignore the intraday low). Thursday and Friday both saw one VIX Top Composite signals but two are needed to get a Top Signal.



VOLATILITY - CURVE



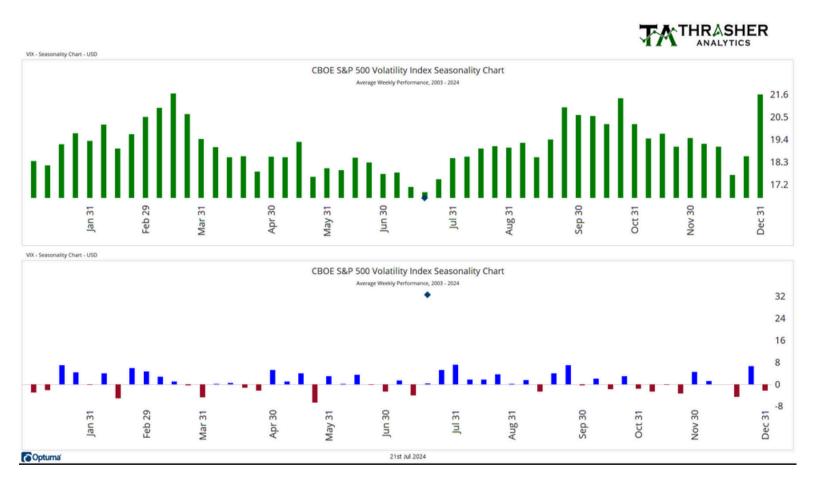
Curve remains in contango with the 1m-3m spread decreasing to less than 1.



VOLATILITY - SEASONALITY



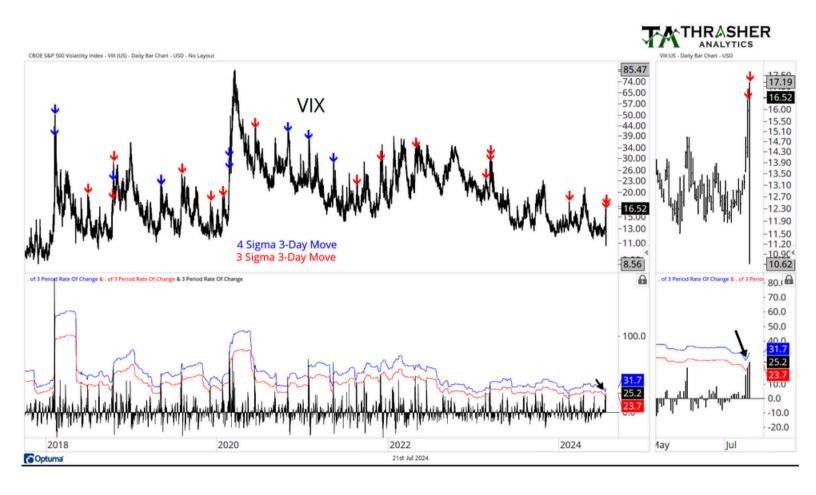
Two weeks ago, I discussed how we were nearing the low in VIX seasonality. VIX seems to be following that pattern this year as well, with the latest rise off a low last week. Seasonal strength has typically lasted until September-October.



VOLATILITY - SIGMA



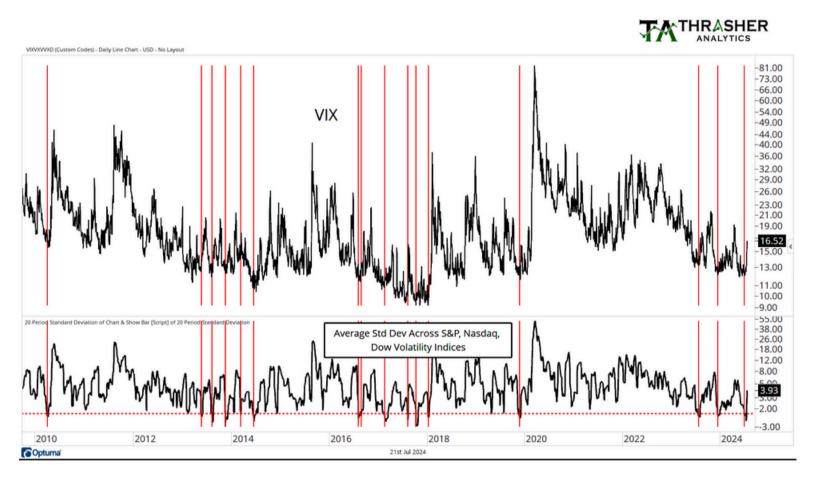
For the first time in several months, the VIX has had a 3-sigma event based on its 3-day move. We haven't had a 4-sigma event since 2021.



VOLATILITY - DISPERSION



Here's the look at the updated chart for the composite of dispersion for the Volatility Indices for SPX, Nas100, and the Dow. When shared, this marked the low in the VIX Index like it has several times prior.



MAESTRO MODEL



Please be sure to check out the Maestro Model Summary PDF in the Archive on the website.

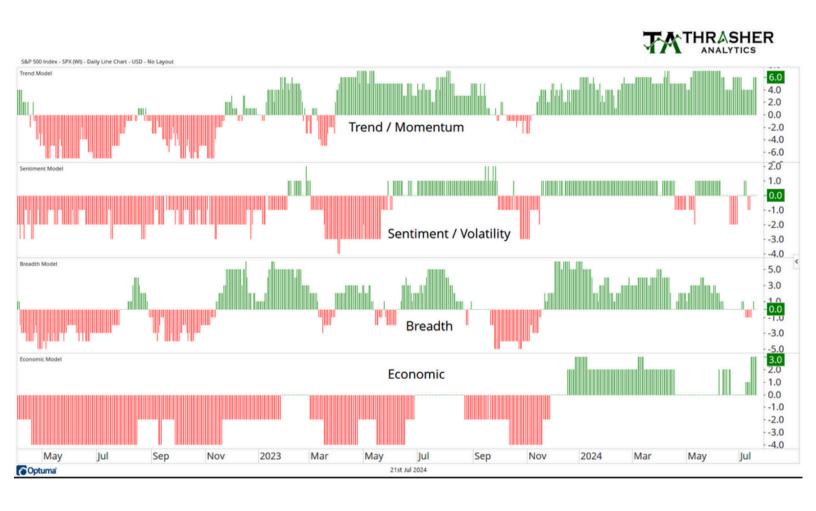
Maestro Model rose three points from two weeks ago to +9.



MAESTRO MODEL - CATEGORIES



Trend/Momentum rose +2, Breadth fell 1 point, and econ up by 3 points.



SENTIMENT SCORE



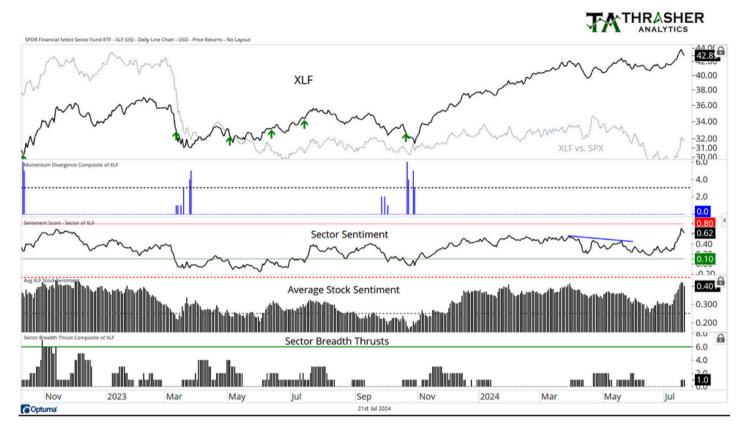
Health Care moved up to the highest scoring sentiment sector followed by Financials and Industrials as Tech went from the highest two weeks ago to the second lowest this week. XLC and XLK indiv. stock sentiment got overheated with scores above 0.45. XLI bullish sentiment signal has worked well.



Daily - Watchlist - No Layout					O.		
Sector	Ticker	Sector Sentiment ▼	Change in Score	1W Perf	1M Perf	3M Perf	±
SPDR Health Care Select Sector Fund ETF	XLV	0.63	0.13	-0.27%	1.34%	6.42%	
SPDR Financial Select Sector Fund ETF	XLF	0.62	0.18	1.11%	3.83%	6.12%	
SPDR Industrial Select Sector Fund ETF	XLI	0.58	0.17	0.56%	1.40%	3.65%	
SPDR Real Estate Select Sector Fund ETF	XLRE	0.55	0.08	1.30%	5.28%	12.90%	
SPDR Consumer Staples Select Sector Fund ETF	XLP	0.52	0.19	0.83%	0.40%	4.90%	
SPDR Materials Select Sector Fund ETF	XLB	0.46	0.07	-0.43%	0.64%	1.29%	
SPDR Consumer Discretionary Select Sector Fund ETF	XLY	0.41	-0.05	-1.92%	3.85%	10.63%	
SPDR Utilities Select Sector Fund ETF	XLU	0.38	0.00	-1.59%	1.34%	7.18%	
SPDR Energy Select Sector Fund ETF	XLE	0.34	0.19	2.04%	4.21%	-2.74%	
SPDR Technology Select Sector Fund ETF	XLK	0.24	-0.21	-5.53%	-4.55%	14.72%	
SPDR Communication Services Select Sector ETF	XLC	0.14	-0.02	-1.39%	1.29%	7.10%	П

SENTIMENT SCORE: XLF & XLY

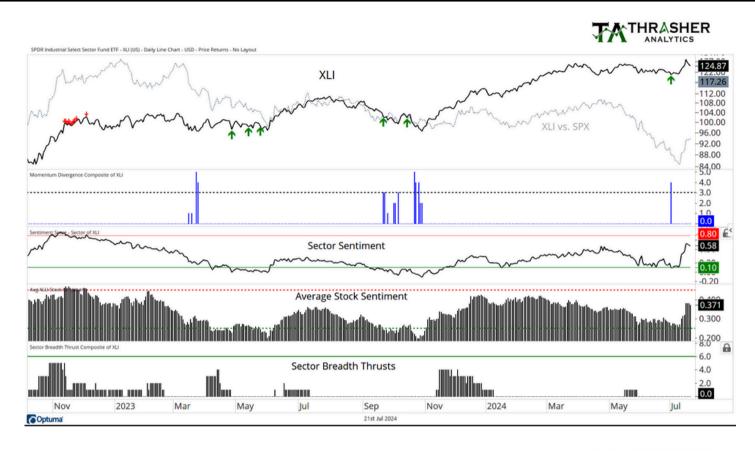


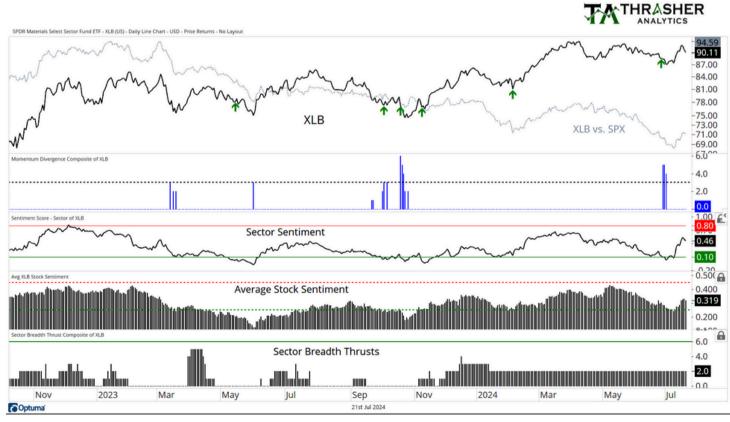




SENTIMENT SCORE: XLI & XLB

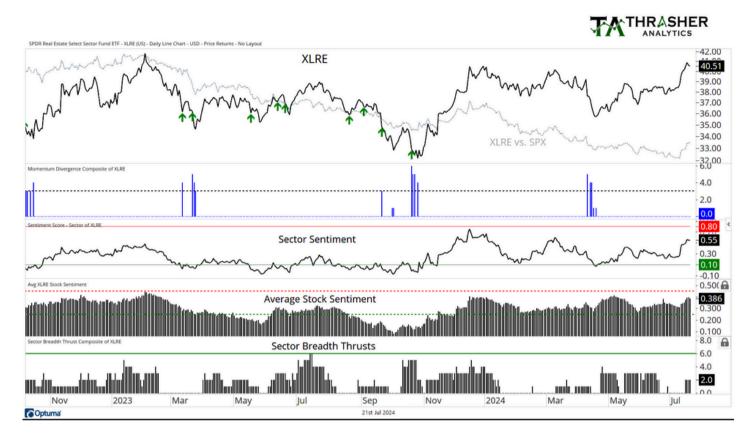


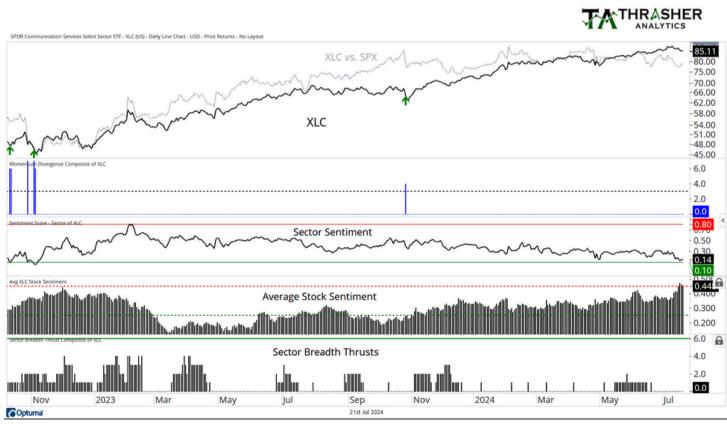




SENTIMENT SCORE: XLRE & XLC 不然



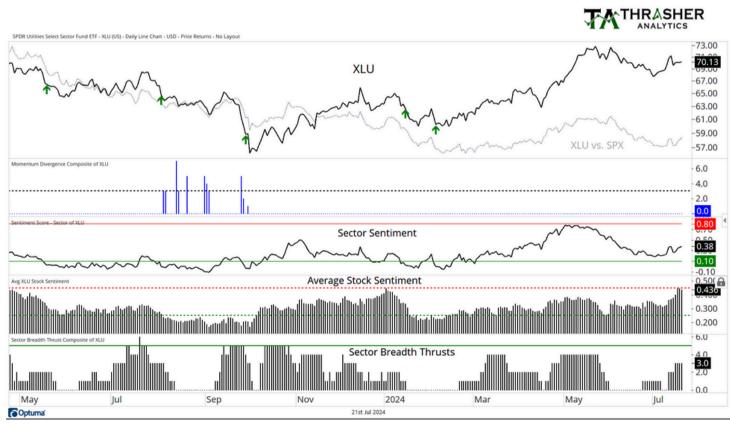




SENTIMENT SCORE: XLP & XLU

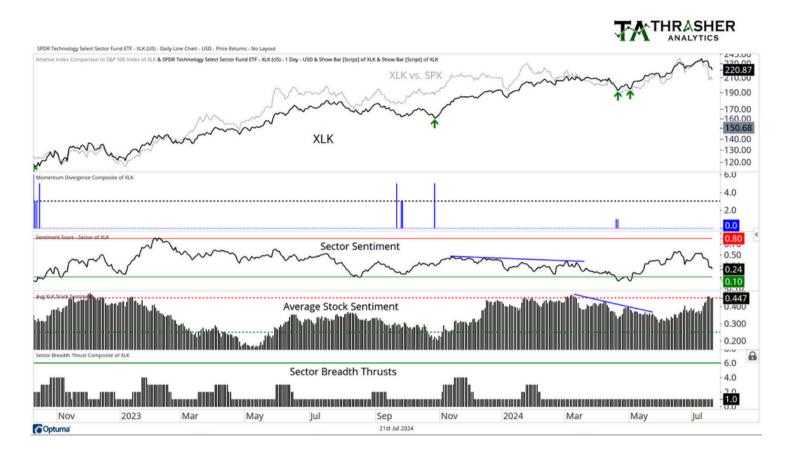


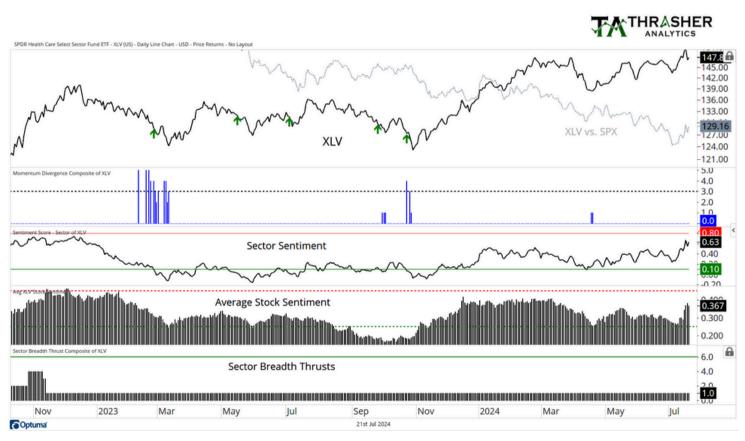




SENTIMENT SCORE: XLK & XLV

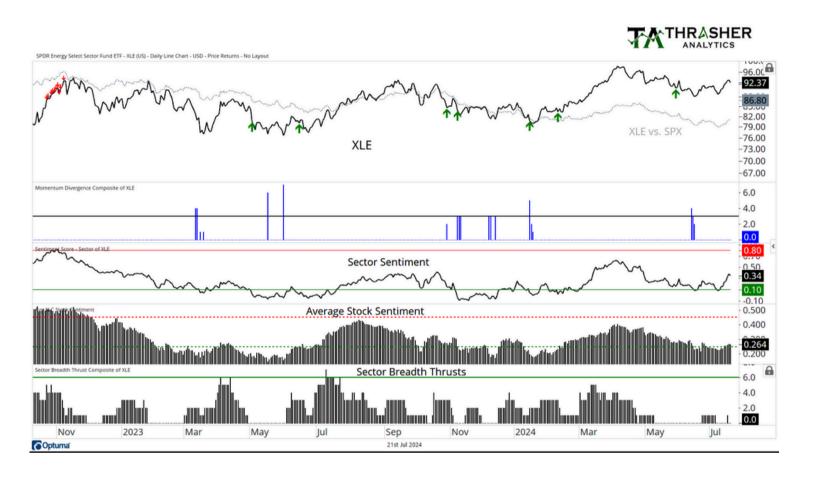






SENTIMENT SCORE: XLE





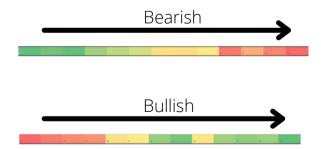
RISK APPETITE RATIO



Below is a table of 16 gauges of risk appetite such as offense vs. defense sectors, foreign markets vs. domestic, small vs. large cap, lumber vs gold, high beta vs. broad market, high yield debt vs. Treasury debt, etc. The table shows each ratio's 1-year percentile going back the last 35 trading days. As the data improves, it turns green and as it declines it becomes red.

The average Risk Appetite Ratio percentile is at the 51st percentile.

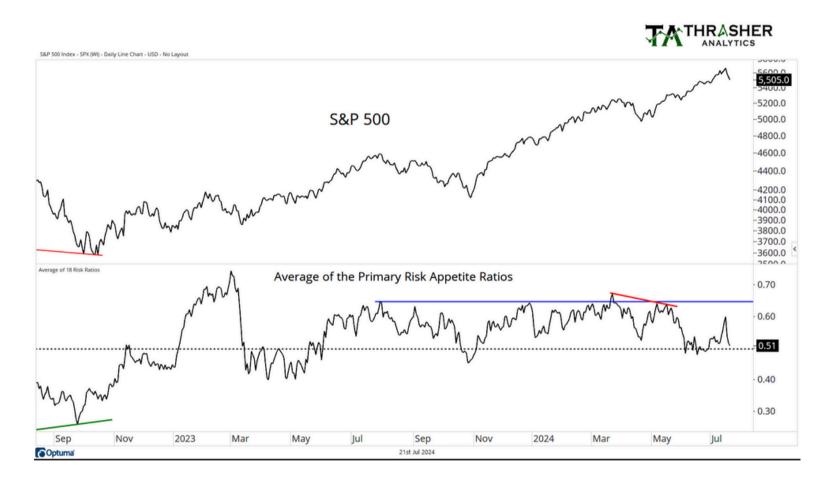
Risk Metric	-35	-34	-33	-32	-31	-30	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	.9	-8	-7	-6	-5	-4	-3	-2	-1	Current
Emerging Market vs. SPX	0.15	0.17	0.07	0.12	0.04	0.06	0.00	0.04	0.05	0.00	0.01	0.00	0.00	0.00	0.04	0.04	0.05	0.07	0.02	0.01	0.01	0.04	0.04	0.00	0.00	0.07	0.06	0.00	0.06	0.14	0.12	0.05	0.05	0.04	0.03	0.01
EAFE vs. SPX	0.07	0.18	0.07	0.12	0.04	0.00	0.09	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.04	0.03	0.07	0.00	0.01	0.01	0.04	0.04	0.02	0.06	0.07	0.00	0.00	0.00	0.10	0.13	0.05	0.05	0.04	0.10	0.10
HY Debt vs. Treasury	0.07	0.10	0.19	0.20	0.24	0.13	0.20	0.12	0.06	0.00	0.03	0.00	0.00	0.00	0.01	0.03	0.01	0.09	0.08	0.02	0.02	0.05	0.05	0.02	0.00	0.07	0.03	0.00	0.03	0.20	0.15	0.06	0.05	0.11	0.20	
		0.90	0.89	0.81	0.74	0.72	0.72	0.80	0.85	0.80	0.78	0.70	0.63	0.69	0.66	0.69	0.70	0.67	0.67	0.72	0.71	0.79	0.88	0.85	0.79	0.75	0.74	0.76	0.75	0.72	0.71	0.78	0.72	0.71	0.74	0.76
Home Construction vs. SPX	0.60	0.70	0.71	0.66	0.56	0.60	0.55	0.52	0.54	0.50	0.60	0.61	0.54	0.54	0.52	0.48	0.48	0.54	0.41	0.39	0.40	0.42	0.31	0.28	0.27	0.22	0.27	0.24	0.28	0.54	0.59	0.58	0.79	0.75	0.79	0.81
Offense vs. Defense Sectors	0.72	0.67	0.61	0.56	0.52	0.56	0.56	0.57	0.56	0.60	0.71	0.71	0.67	0.77	0.77	0.74	0.75	0.67	0.72	0.73	0.75	0.77	0.82	0.88	0.97	0.91	0.93	0.89	0.91	0.80	0.83	0.94	0.93	0.74	0.80	0.69
Broker-Dealer vs. SPX	0.71	0.73	0.70	0.67	0.68	0.66	0.64	0.57	0.56	0.44	0.45	0.37	0.36	0.34	0.35	0.39	0.40	0.46	0.44	0.40	0.40	0.46	0.51	0.52	0.47	0.43	0.36	0.43	0.39	0.55	0.52	0.66	0.64	0.75	0.65	0.67
S&P Growth vs. S&P Value	1.00	0.84	0.75	0.81	0.85	0.96	0.96	0.96	0.98	1.00	1.00	1.00	1.00	1.00	0.99	0.92	0.91	0.83	0.95	0.99	1.00	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86	0.79	0.64	0.65	0.65
Semiconductor vs. SPX	0.97	0.95	0.89	0.93	0.91	1.00	0.98	0.98	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.93	0.90	0.81	0.86	0.85	0.83	0.86	0.85	0.86	0.91	0.90	0.94	0.94	0.98	0.90	0.92	0.91	0.89	0.73	0.76	0.71
Consumer Disc. Vs. Staples	0.82	0.88	0.86	0.87	0.82	0.89	0.87	0.87	0.92	0.88	1.00	0.99	0.91	0.92	0.91	0.94	0.95	0.92	0.92	0.93	0.99	1.00	0.92	0.89	0.92	0.88	0.91	0.93	0.94	1.00	1.00	1.00	1.00	0.83	0.79	0.81
Small Cap vs. Utilities	0.29	0.27	0.17	0.18	0.12	0.22	0.23	0.23	0.18	0.18	0.29	0.23	0.17	0.26	0.27	0.21	0.25	0.24	0.27	0.28	0.32	0.40	0.39	0.38	0.35	0.32	0.35	0.31	0.31	0.40	0.42	0.64	0.78	0.72	0.62	0.59
Transports vs. Utilities	0.26	0.26	0.23	0.22	0.14	0.22	0.24	0.26	0.23	0.22	0.27	0.20	0.15	0.22	0.22	0.22	0.22	0.19	0.22	0.29	0.25	0.33	0.33	0.33	0.34	0.28	0.26	0.19	0.17	0.17	0.16	0.32	0.42	0.28	0.22	0.21
Equal Weight vs. Cap Weight	0.00	0.11	0.15	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.10	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.13	0.15	0.14	0.21	0.28	0.27	0.27
Small cap vs. Large Cap	0.01	0.12	0.12	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.04	0.08	0.04	0.02	0.06	0.11	0.05	0.03	0.01	0.00	0.03	0.00	0.00	0.23	0.25	0.34	0.49	0.51	0.44	0.45
Equities, vs. VIX	0.69	0.66	0.84	0.82	0.82	0.90	0.91	0.96	0.89	0.88	1.00	1.00	0.90	0.90	0.97	0.84	0.84	0.82	0.89	0.93	0.97	0.94	0.97	1.00	1.00	0.96	0.97	0.95	0.93	0.90	0.97	0.89	0.89	0.73	0.58	0.53
Aussie Dollar vs. Yen	1.00	0.99	0.85	0.92	0.92	0.86	0.93	0.93	0.98	0.97	0.95	0.97	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.89	0.87	0.86	0.85	0.75	0.78	0.76
Copper vs. Gold	0.82	0.64	0.62	0.59	0.47	0.49	0.55	0.46	0.53	0.49	0.49	0.48	0.42	0.40	0.41	0.45	0.39	0.35	0.31	0.34	0.23	0.30	0.35	0.37	0.42	0.51	0.54	0.48	0.49	0.25	0.37	0.26	0.08	0.04	0.00	0.07
AVERAGE	0.56	0.57	0.54	0.53	0.49	0.52	0.53	0.52	0.52	0.50	0.54	0.52	0.48	0.50	0.51	0.49	0.50	0.49	0.49	0.49	0.50	0.53	0.53	0.53	0.54	0.52	0.52	0.51	0.52	0.54	0.55	0.58	0.60	0.54	0.52	0.51



RISK APPETITE RATIO



The Average Risk Appetite Ratio fell again to the 51st percentile, remaining week for several months.



EQUITIES - BREADTH



Below is a table showing the changes in breadth data over the last 35 days. This provides insight into whether bullish or bearish data is improving or declining.

	35 Days Ago	30 Days Ago	25 Days Ago	20 Days Ago	15 Days Ago	10 Days Ago	5 Days Ago	Current
			M	oving Averag	e Breadth			
S&P 500 % above 200-day MA	65.0	67.4	66.4	67.0	67.4	64.0	71.4	72.0
Nasdaq 100 % above 200-day MA	71.3	68.3	63.4	60.4	61.4	66.3	62.4	63.4
S&P 500 % above 50-day MA	42.0	48.7	46.3	50.9	47.7	43.7	68.4	63.6
Nasdaq 100 % above 50-day MA	55.5	51.5	47.5	55.5	54.5	65.4	61.4	64.4
S&P 500 % above 20-day MA	28.8	39.8	37.6	52.7	47.1	43.1	80.7	69.2
Nasdaq 100 % above 20-day MA	76.2	56.4	45.5	50.5	49.5	69.3	56.4	63.4
				Bullish Bre	adth			
S&P 500 % RSI(14) > 70	13.9	8.6	3.4	3.8	5.2	4.8	3.4	4.0
Nasdaq 100 % RSI(14) > 70	14.9	8.9	4.0	6.9	8.9	8.9	6.9	11.9
S&P 400 % New 52 week highs	13.7	4.5	2.0	2.0	2.0	3.2	2.7	1.0
S&P 600 % New 52 week highs	8.5	3.8	2.2	1.3	0.8	1.3	1.7	1.5
S&P 500 % New 52 week highs	2.8	5.4	3.4	6.2	2.2	3.4	12.1	2.2
Nasdaq 100 % New 52 week highs	9.9	5.9	8.9	17.8	7.9	2.0	11.9	10.9
S&P 500 % New 6 month highs	3.4	5.6	3.6	6.6	2.4	4.0	14.5	2.2
Nasdaq 100 % New 6 month highs	10.9	11.9	4.0	9.9	6.9	5.9	5.9	12.9
				Bearish Bre	eadth			
S&P 500 % RSI(14) < 30	7.8	3.0	5.0	2.0	1.6	2.8	1.0	1.6
Nasdaq 100 % RSI(14) < 30	0.0	3.0	11.9	4.0	6.9	2.0	1.0	1.0
S&P 400 % New 52 week lows	0.0	0.8	1.3	1.3	2.5	4.0	1.3	3.8
S&P 600 % New 52 week lows	0.7	2.5	0.7	2.2	3.2	2.3	2.5	5.2
S&P 500 % New 52 week lows	1.6	1.4	0.8	3.2	0.4	0.2	1.4	0.8
Nasdaq 100 % New 52 week lows	1.0	0.0	1.0	2.0	0.0	1.0	2.0	2.0
S&P 500 % New 6 month lows	3.4	3.8	3.6	8.4	1.8	1.4	2.2	1.2
Nasdaq 100 % New 6 month lows	0.0	5.0	10.9	3.0	8.9	3.0	1.0	1.0

EQUITIES - S&P 500 DAILY



For the first time since the end of May, the S&P 500 has closed under its 20-day moving average. This is a short-term development, but one we haven't had occur in nearly two months. 5380 is when we'll have the Index down more than -5% which would require a break of the intermediate 50-day MA but would still be above prior support of the 100-day MA

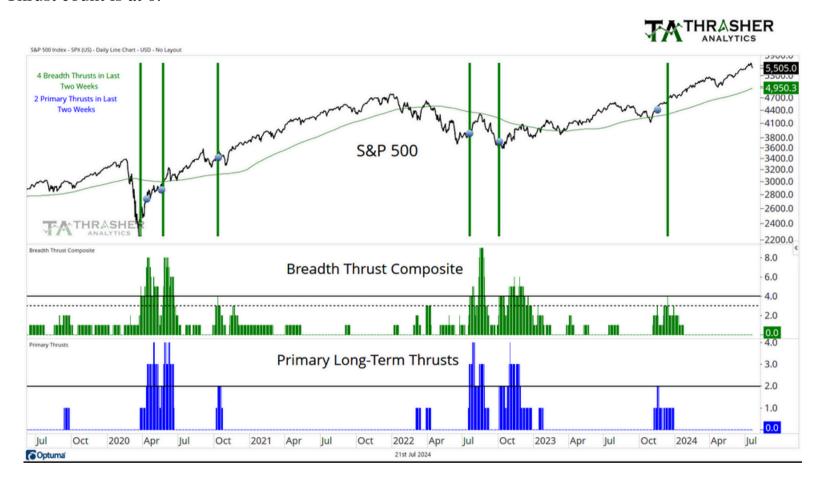


EQUITIES - BREADTH THRUSTS



I've added an add'l section of the breadth thrust composite chart, titled Primary Long-Term Thrusts. These are the handful of thrusts that are in the original composite that have the best track record and only have the highest bar to clear to signal. The original composite is still what 'feeds' the breadth category of the Maestro Model.

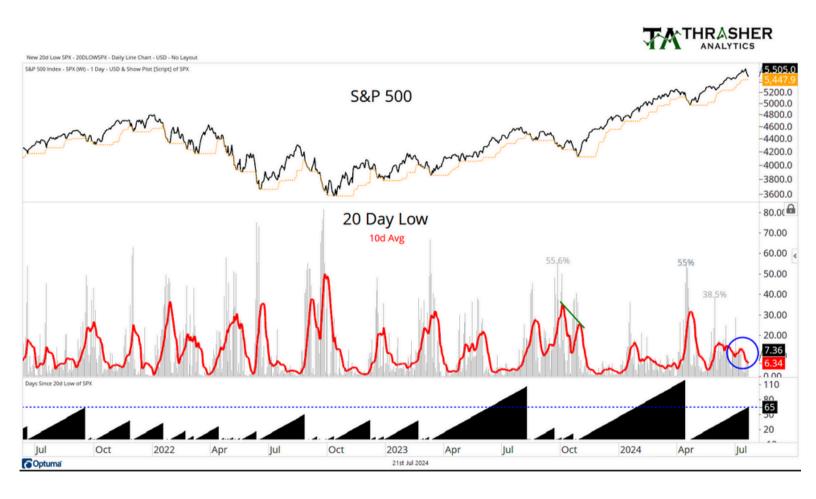
Thrust count is at 0.



EQUITIES - 20-DAY LOWS



While the S&P 500 has fallen a few percent and closed under its 20-day MA, it's still not at a 20-day low yet and we haven't seen a major pick up in stocks making new 20-day lows. This should make some sense. I've been discussing (as have many other analysts) that the market is heavily driven by the Mega Caps, mostly just Apple and NVDA recently. The market didn't need to see a drop by a massive number of stocks to experience weakness, it just needed the mega cap few to stumble, which is what we've seen occur. So, while some will point to just 7% of stocks at a 20-day low on Friday as a positive, in the market we are in, it's less relevant when the Big Boys are weakening.



EQUITIES - GROWTH VS. VALUE



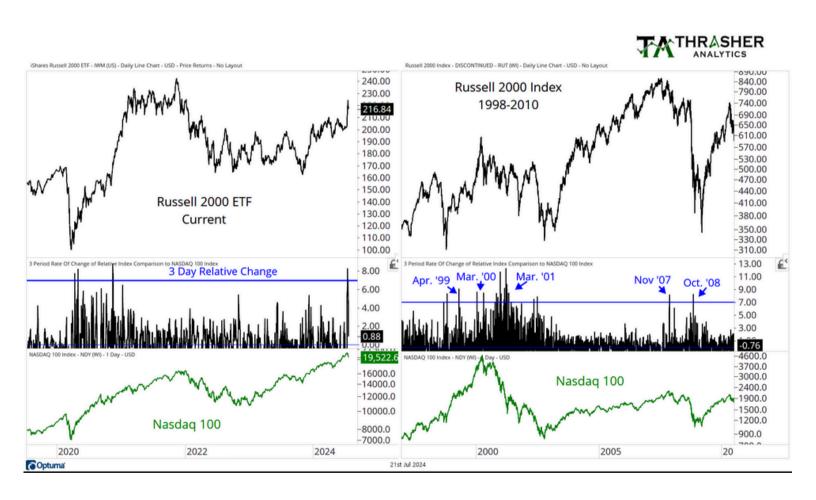
Below is a look at the relative performance ratio of the S&P 500 Growth vs. the S&P 500 Value factors. The ratio has risen back to the level hit in September 2020 and exceeded just briefly at the end of 2021. What's notable about these periods is Sept. '20 was when we saw a quick -10% drop in the SPX and of course Dec. '21 was near the peak in the Index before the bear market of 2022. This tells us the market views these levels as being excessive and rotation then taking place, with Value seeing the strongest of the major factors (more later in the letter) last week.



EQUITIES - SMALL CAP STRENGTH



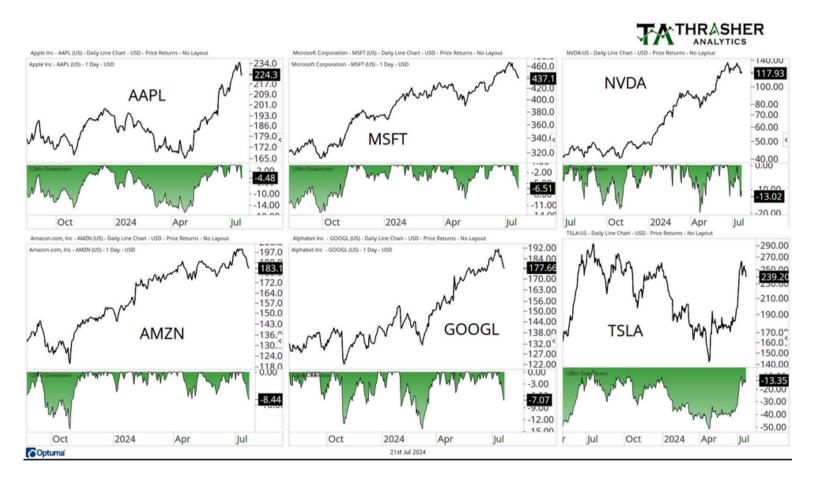
Last week saw small cap stocks show huge relative performance gains relative to both the S&P 500 and Nasdaq 100. Some have made calls that this is the rotation needed to keep equities afloat. Here's the problem, this is occurring when there's a massive weight of the SPX in just a few tech stocks. That means rotation can occur but doesn't mean it can "save" the large cap index. Below we can see the prior instances of small cap strength relative to the Nasdaq 100, hitting 8% last week. We had several instances of this after the Covid Crash but looking back at the 2000 and 2007 periods, "rotation" to small or value didn't save the market. Instead, it began to market periods of continued weakness: April '99, March 2000, March 2001, November 2007, October 2008.



EQUITIES - BIG 6



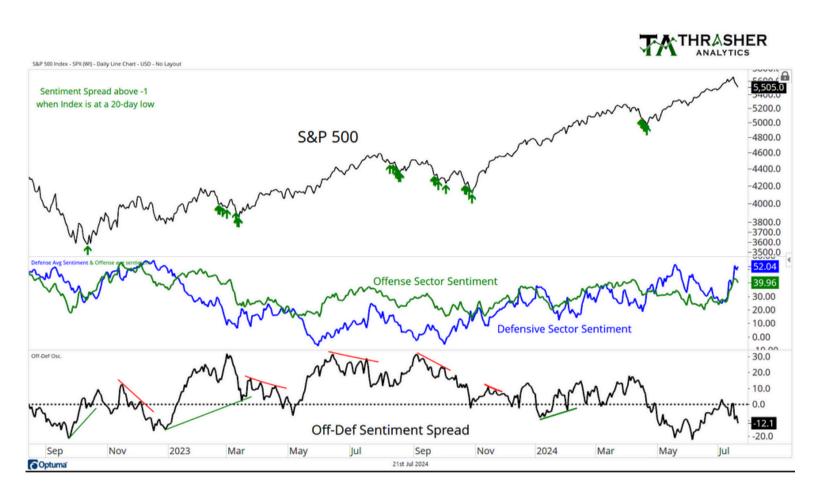
Here are six of the largest and most watched stocks in the market today. Here we can see where weakness developed over the last week. Apple is down almost -5a%, Nvidia is off double-digits and the others are down over -6%. Google and Tesla report earnings this week, we'll see how that impacts these drawdowns and if more sellers begin to step in.



EQUITIES - SECTOR SENTIMENT



The Offense-Defense Sentiment Spread moved lower as Tech and Comm. sentiment fell last week.



SECTOR - PERFORMANCE



THRASHER ANALYTICS

- Ticker	Name	2024	YTD Rel% to SPX	1W % ∀	1M %	3M%	6M%	% from 52Wk High	% from 52Wk Low	% From 20MA	% From 50MA	% From 200MA
			AVG: -4.44%					AVG: 3.65%	AVG: 31.41%		AVG: 2.39%	
SML	S&P SmallCap 600 Index		-9.27%				8.67%			4.61%		
DJI	Dow Jones Industrial Average	6.89%							24.62%	1.52%		
MID	S&P Midcap 400 Index	8.40%							29.84%	1.87%		
SPX	S&P 500 Index											
NDY	NASDAQ 100 Index								38.87%			
								AVG: 3.60%	AVG: 27.35%			
XLE	SPDR Energy Select Sector Fund ETF									1.47%		4.47%
XLRE	SPDR Real Estate Select Sector Fund ETF	1.12%					4.68%					
XLF	SPDR Financial Select Sector Fund ETF				3.83%			2.85%			2.85%	
XLP	SPDR Consumer Staples Select Sector Fund ETF	8.41%					8.38%		19.81%			
XLI	SPDR Industrial Select Sector Fund ETF											
XLV	SPDR Health Care Select Sector Fund ETF	8.42%				6.42%						
XLB	SPDR Materials Select Sector Fund ETF							3.85%				
XLC	SPDR Communication Services Select Sector ETF										0.82%	
XLU	SPDR Utilities Select Sector Fund ETF							3.81%				
XLY	SPDR Consumer Discretionary Select Sector Fund				3.85%							
XLK	SPDR Technology Select Sector Fund ETF								38.48%			

EQUITIES - FACTORS



Below is a look at the major S&P 500 factors and their relative performance to the Index.



SECTOR - RELATIVE STRENGTH



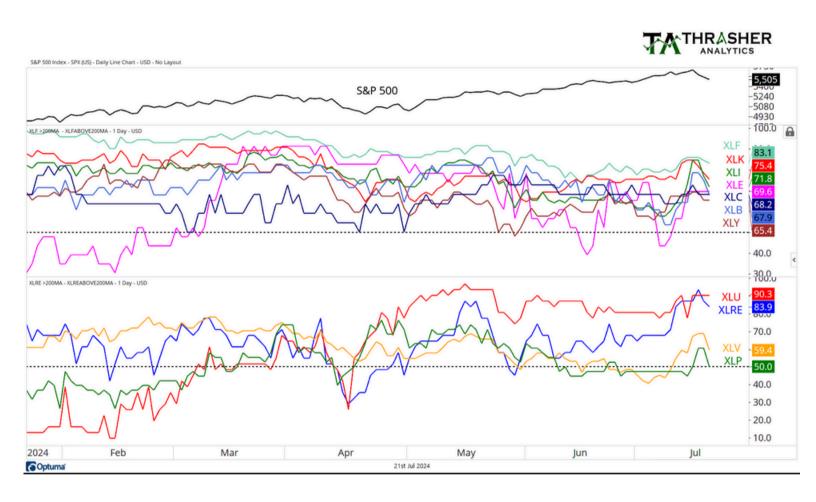
Below is a look at each sector's relative performance trend against the S&P 500.



SECTOR - BREADTH 200-MA



Most sector breadth lines moving lower.



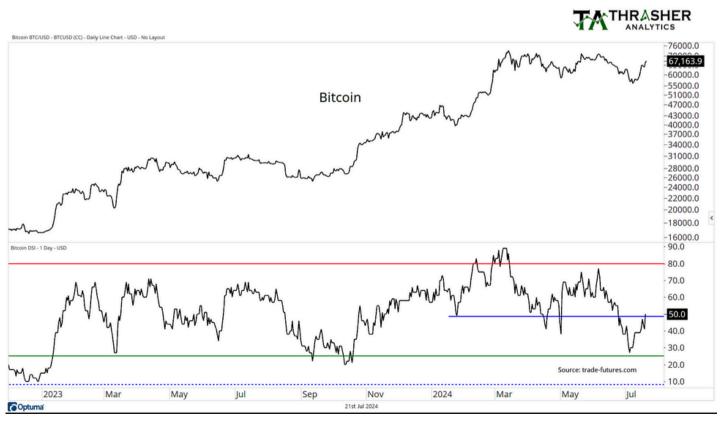


Daily - DSI - No Layout		0		Daily - DSI - No Layout			0
Code	History	% Bullish 🔦	5-day MA	Code	History	% Bullish 🔦	5-day MA
Palladium DSI	Janes Janes	10	17	Orange Juice DSI	Marian Asses	52	57
Soybean DSI			13	Silver DSI	and the state of	56	66
Corn DSI	particular the particular to		18	Heating Oil DSI	11.14	56	64
Wheat DSI	THE RESERVE AND DESCRIPTION OF THE PERSON OF		13	Australian Dollar DSI	Annual State of London	57	66
Sugar DSI	Sales Jacobs		34	10Y DSI	Augusta Albeit	57	66
Cotton DSI	And the last	26	31	Platinum DSI	A.A. A.A.M	58	66
Copper DSI	and the state of the state of	33	50	Cattle DSI	MARLEY AND	58	57
Swiss Franc DSI	Mary Ash	34	38	British Pound DSI	distribution	58	61
Yen DSI	A 1 1	35	33	EuroDollar DSI	State of the	60	64
Cocoa DSI	Land Strain	35	40	New Zealand Dollar DSI	Mary and their	61	67
Natural Gas DSI		37	35	SPX DSI	Mark Company	62	75
VIX DSI	A STATE OF THE STA	40	28	Nasdaq DSI	man, and a	62	74
US Dollar DSI	and the same	41	35	Crude Oil DSI	10.00	62	67
Nikkei DSI	Maria de la compansión de	46	57	Mexican Peso DSI	10000	63	70
Lean Hog DSI		46	37	CRB Index DSI	1	63	71
Euro DSI	Mary Janes	47	51	Gold DSI	The last state	65	76
Gasoline DSI	making and	48	53	5YR DSI	Ad 100	66	69
Lumber DSI		49	41	Coffee DSI	A STATE OF THE STA	69	73
Bitcoin DSI	The said of	50	45	Type Code or Name to ad	d an item to the w	atchlist	

Source: trade-futures.com

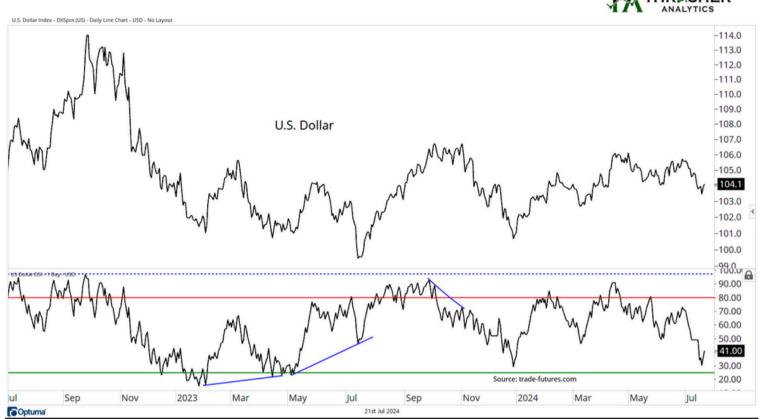








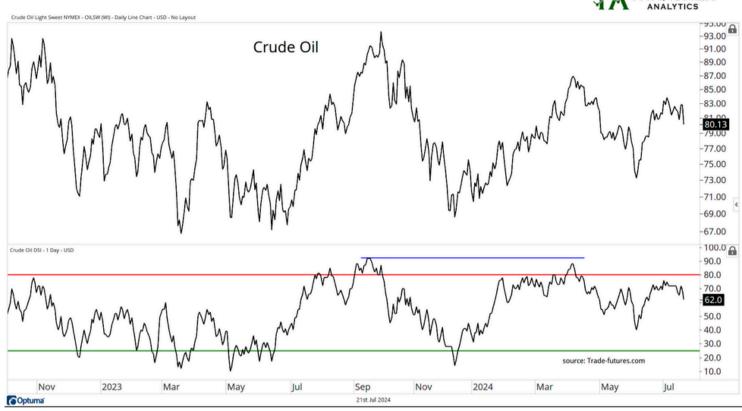




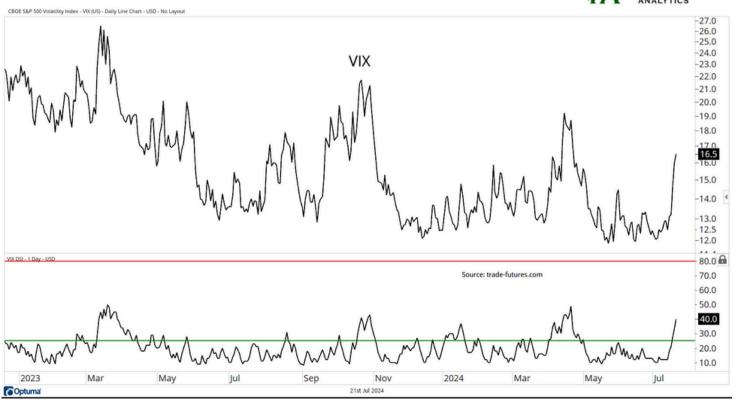








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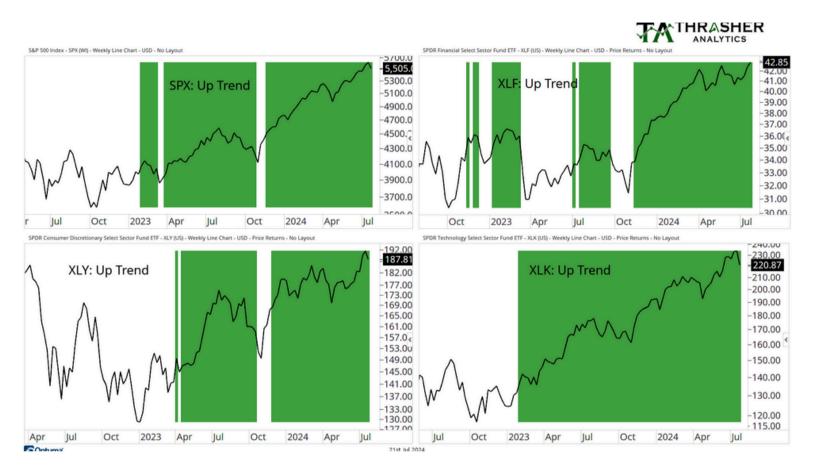






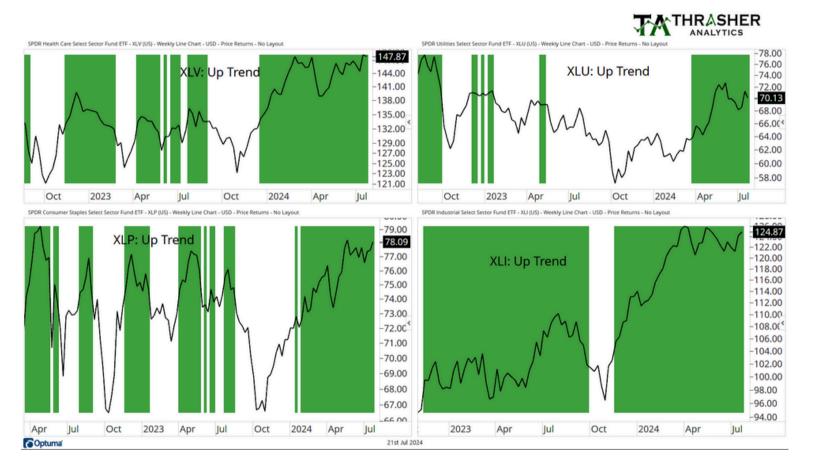
TREND MODELS





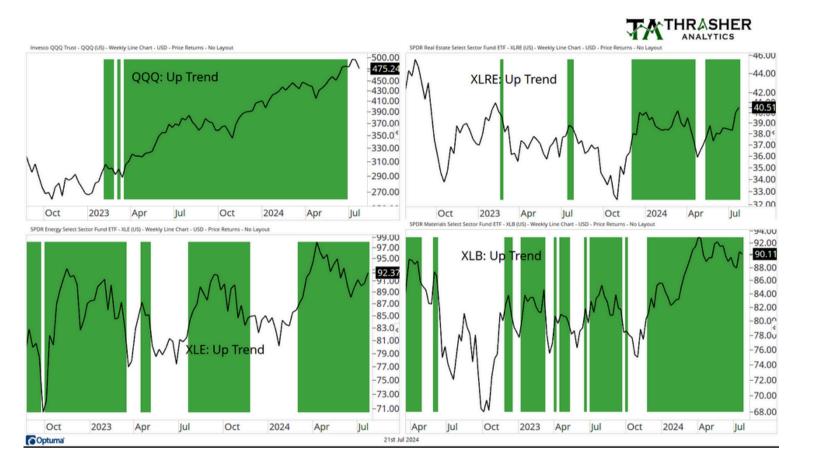
TREND MODELS





TREND MODELS







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