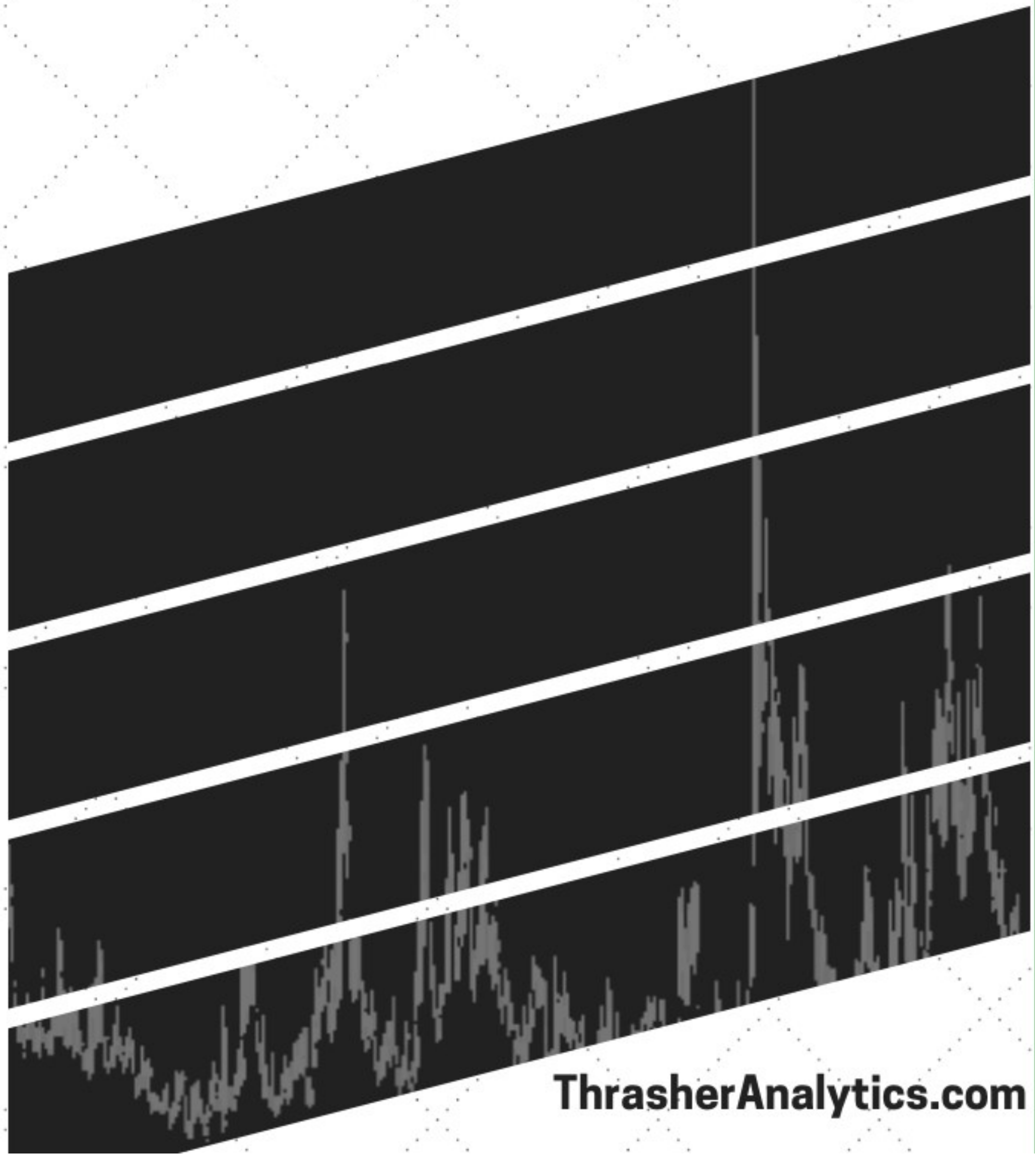
THRASHER ANALYTICS



WEEKLY RESEARCH & ANALYSIS

ThrasherAnalytics.com

Sector Rotation: April	
Technology	XLK
Health Care	XLV
Consumer Staples	XLP

Fixed Income Rotation: Q2	
Emerging Mkt Sovereign	PCY
Convertible Bond	CWB

Index & Sector Adaptive Trend	Up Trend	Down 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

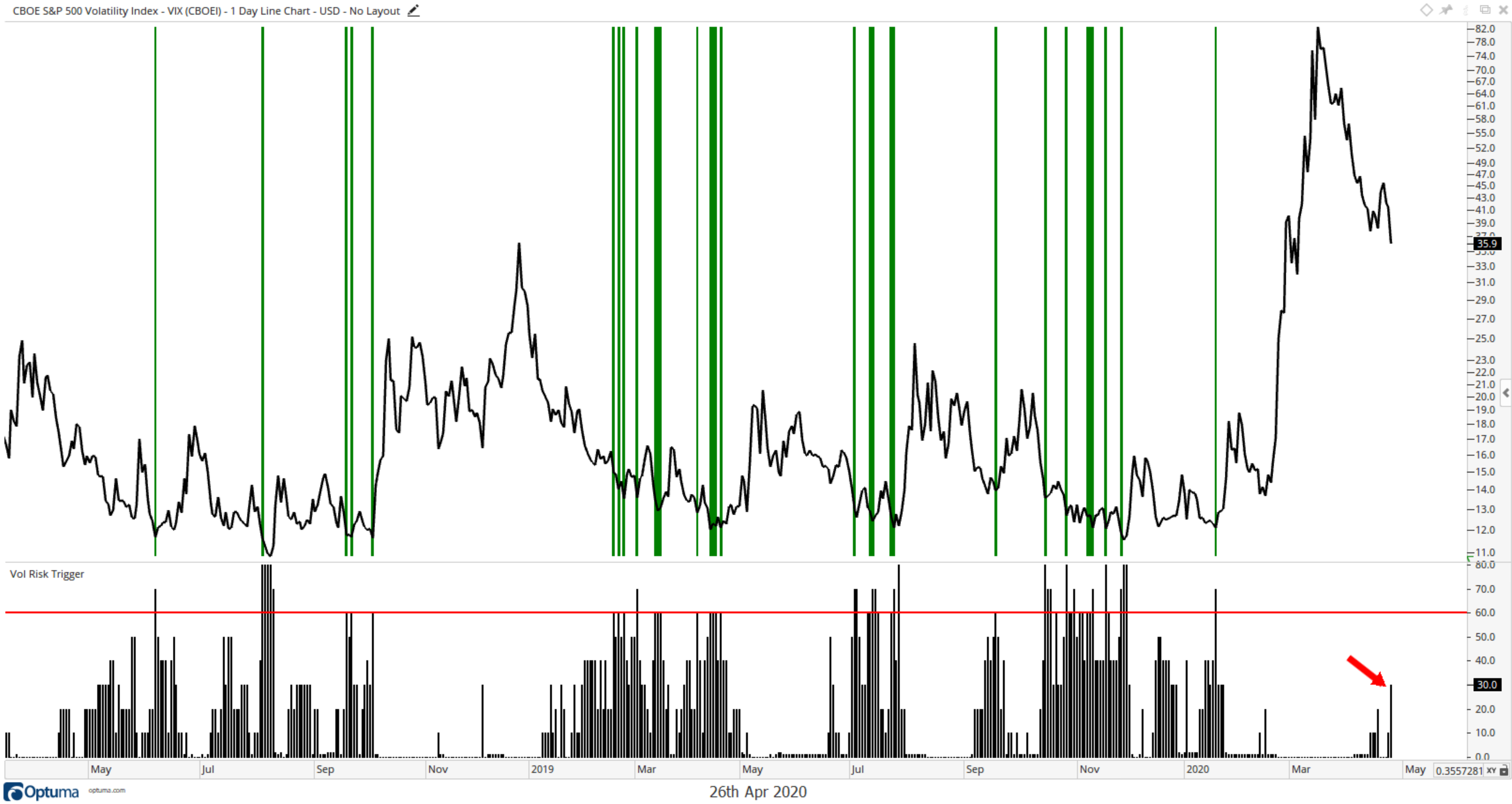
Daily Sentiment Index	% Bullish	5-day MA
S&P 500	45%	44%
Nasdaq 100	51%	49%
Nikkei	64%	57%
VIX	52%	56%
10yr Treasury	71%	66%
5yr Treasury	65%	64%
CRB Index	30%	18%
Gold	**78%**	**70%**
U.S. Dollar	73%	71%

**Green<25%* *Red>80%*

Notable Breadth Data:	
SPX >50MA	39.21%
SPX >200MA	21.19%
Nasdaq >50MA	64.08%
Nasdaq >200MA	45.63%

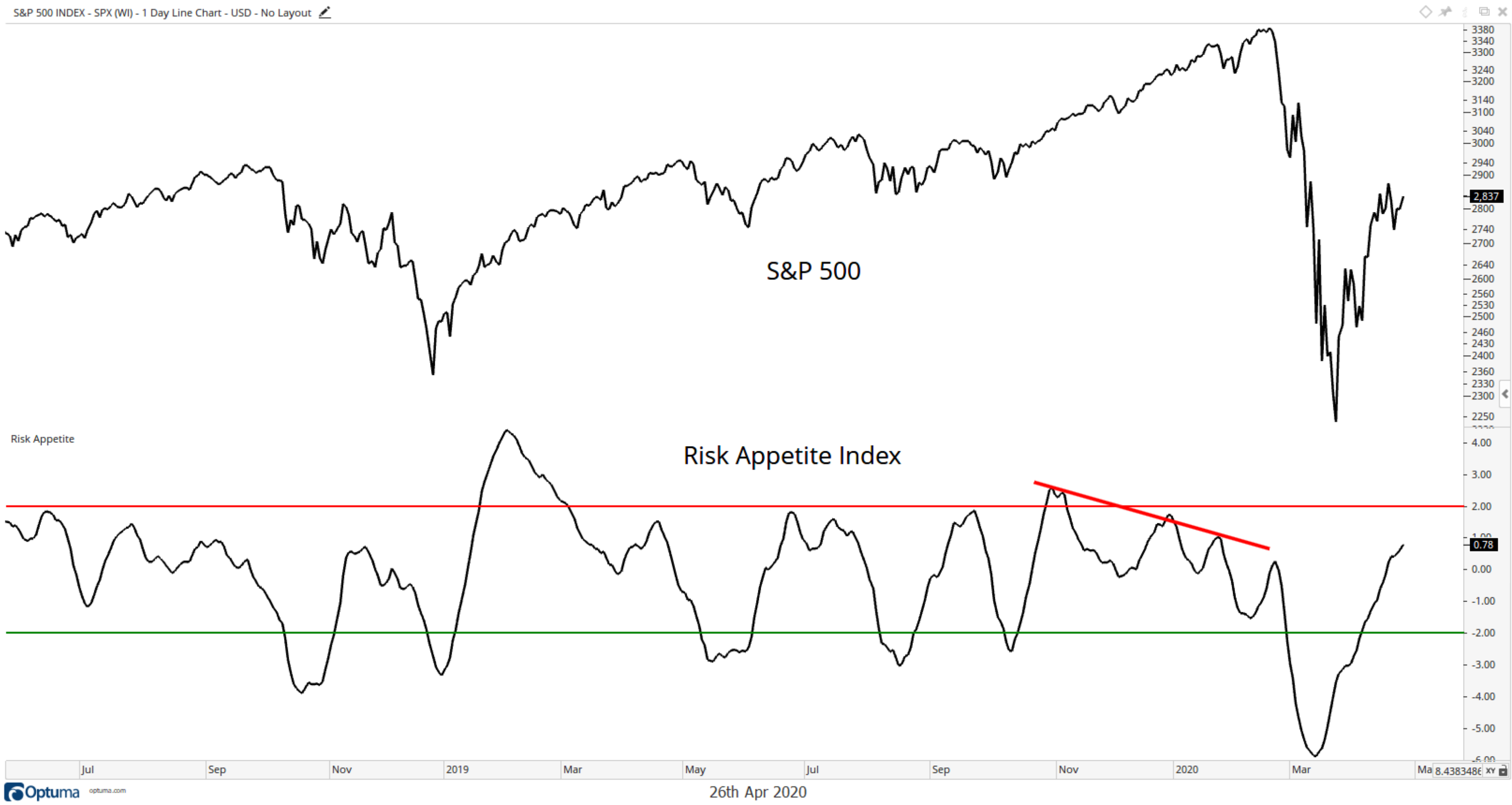
Day - Watch List - No Layout

Sector	> 50MA	> 200MA	1wk Perf	1mo Perf	3mo Perf	12mo Perf
SPDR Energy Select Sector Fund ETF	False	False	1.97%	26.58%	-38.86%	-48.56%
SPDR Communication Services Select Sector ETF	True	False	0.52%	13.69%	-12.62%	-2.29%
SPDR Health Care Select Sector Fund ETF	True	True	-0.49%	24.79%	-2.12%	14.97%
SPDR Consumer Discretionary Select Sector Fund ETF	True	False	-0.6%	17.24%	-10.88%	-6.73%
SPDR Technology Select Sector Fund ETF	True	True	-0.71%	14.20%	-9.03%	12.36%
SPDR Materials Select Sector Fund ETF	True	False	-0.8%	16.33%	-16.54%	-13.03%
S & P 500 Stock Index	True	False	-1.32%	15.91%	-13.92%	-3.09%
SPDR Industrial Select Sector Fund ETF	False	False	-2.42%	12.07%	-26.31%	-21.59%
SPDR Financial Select Sector Fund ETF	False	False	-2.9%	9.52%	-28.46%	-20.66%
SPDR Consumer Staples Select Sector Fund ETF	True	False	-2.96%	14.87%	-7.67%	3.31%
SPDR Utilities Select Sector Fund ETF	False	False	-3.65%	17.20%	-14.69%	0.95%
SPDR Real Estate Select Sector Fund ETF	False	False	-4.23%	19.51%	-17.28%	-7.57%



You may be surprised to see that the VRT has begun to rise again, even though spot VIX is still north of 35! Now it's important to recognize that the Volatility Risk Trigger is still well off the required threshold (red line) but it's now at its highest reading since the prior signal in January. It last crept up like this at the higher-low in February before we saw volatility explode higher. As I mentioned in my last note and wrote a public blog post last week, historically volatility needs to drop below its 30%tile to give confidence volatility as truly subsided and equities can trend higher. We finished the week with VIX at its 34%tile with 3-month vol at 40%tile, suggesting there's still some concern with long-term volatility than for shorter-term volatility based on the current move lower in the vol complex. The 30day-3month portion of the vol curve has moved back into contango, a result of that floor under long-dated volatility expectations and the increase in bullish sentiment for front-month volatility, expecting it to continue to come down as it's done over the last two weeks.

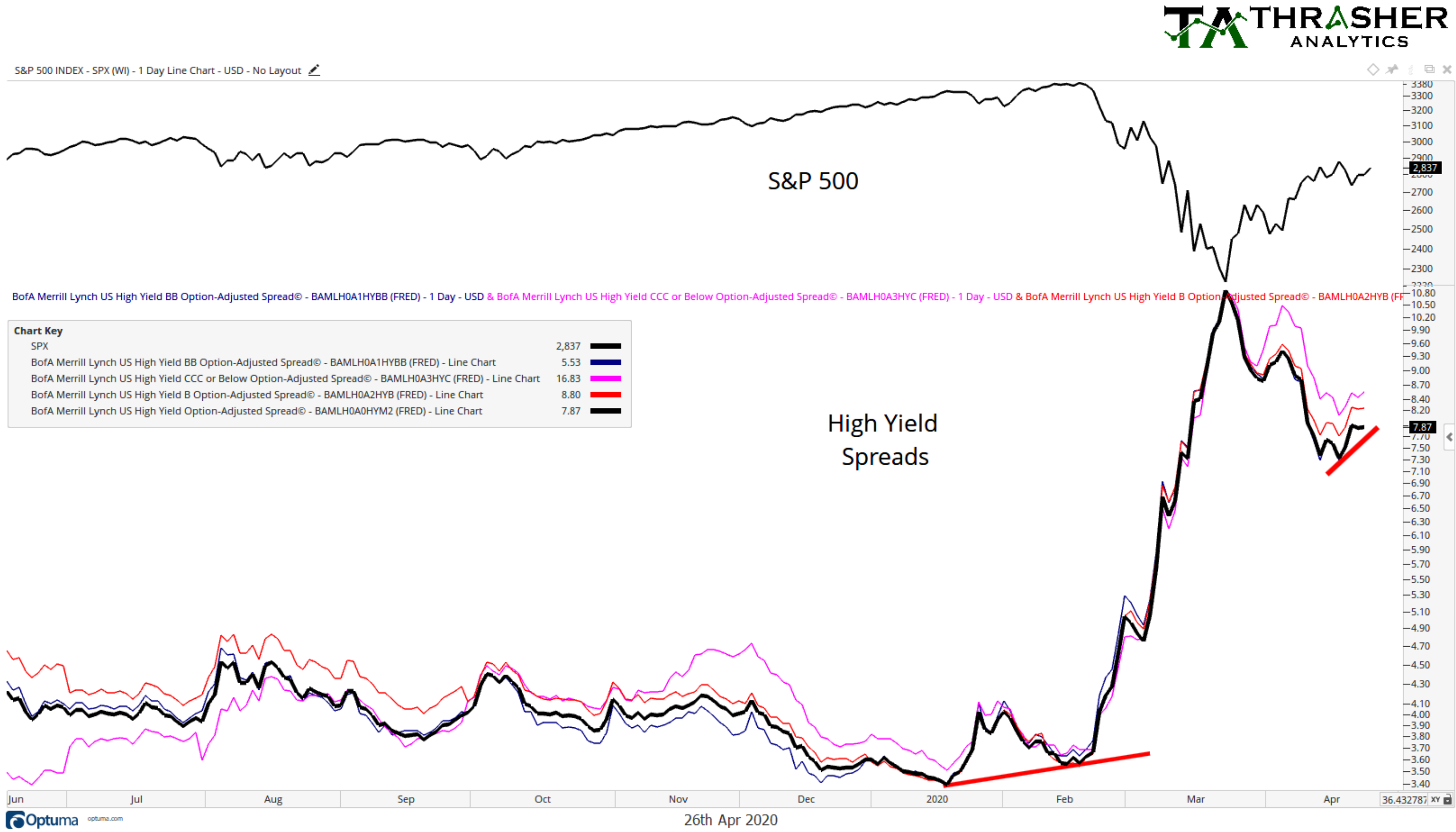
The title of my last full-length letter was "Make it Break it" and that still seems to be the theme today, with SPX holding right around a confluence of important price levels and momentum still hanging out under the upper-end of a bearish range. Last week we cleared the 50% retracement level and squeezed above the 50-day Moving Average on Friday. We hit the Dec. '18 VWAP once and moved lower, so that's going to be a key level if we do see further upside in equities. And of course we are still under the 200-day MA, which has been resistance several times on previous counter-trend rallies in prior bear markets, so we don't want to loose focus of that level. Daily Sentiment Index (DSI) for S&P 500 and Nasdaq 100 have been weakening slightly with DSI for the VIX not making a lower-low with the index—you can check out those specific charts later in the letter. This will be a big news week with earnings from Alphabet, Starbucks, UPS, Southwest, Tesla, Boeing, McDonald's Amazon, Apple, ExxonMobil, eBay, Teladoc, Visa, Yum! And Microsoft all reporting this week. Adding to the list of potential catalysts we get the first look at GDP for Q1 and the FOMC announce this week as well. The last two weeks have been fairly benign and boring but this week has plenty of possible matches to light the fireworks to get price moving again.



The Risk Appetite Index (RAI) has continued to move higher after bottoming with price in March. I'll want to continue to see the RAI move in-line with the S&P 500 going forward. However, as I'll be showing in the next chart, there's several key ratios that aren't showing such positive confirmation.

The chart to the left shows four important (in my opinion) ratios for evaluating risk appetite. Each currently looks pretty lousy in terms of confirming the latest leg up in equity prices. Equal weight, high beta, and small caps all have shown relatively little strength relative to the S&P 500. I'll be looking at high yield a little more closely later in the letter.

If traders were more bullish in taking on risk, you'd expect (and history would confirm) that small caps and high beta stocks would be doing well right now. But they aren't. Three of the four ratios sit just off their March lows.



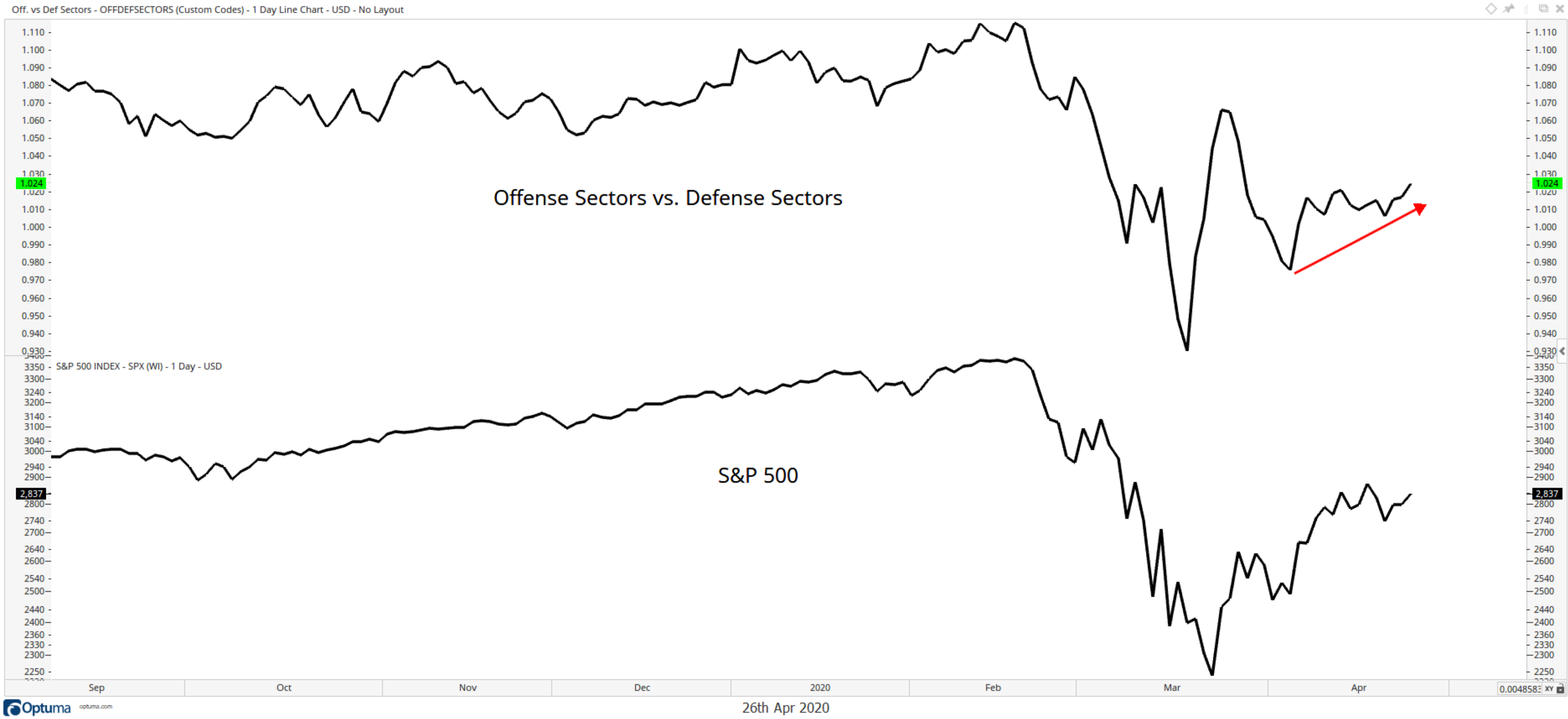
With the financial stress being felt by corporate America due to the Coronavirus economic lockdown, We've already had several reports of retailers under duress with Neiman Marcus announcing a bankruptcy and several others warning they may run out of cash soon. With that, I keep a close eye on the high yield bond spreads to evaluate how the fixed income market is feeling towards these high yield bond issuers. Coming into the February SPX high, we had a higher low in several of the HY bond spreads, which then exploded higher as the market crashed. Then we saw equities bottom and spreads began to come back in, a positive sign from the fixed income corner of the market. But recently spreads have begun to widen again, potentially due to the crash in oil prices. While the turn higher in spreads is still fairly small, if they continue to widen this week, even if equities strength, that's a bad sign that more pain could be in store for corporate America.

Sticking with the high yield bond market, the HY Bond ETF (HYG) has also broken down relative to Aggregate Bond and its own price action. It's unusual to see such a large move lower in HY bond prices when equities have held up firm. Something appears to be going on in fixed income land, and the bond market can often be the tail that wags to the dog, this will be an important market to watch this week.

Tom Demark created a set of unique indicators, one of which is called the TD Buy & Sell Setups, which is a price pattern over nine bars and can be used to signify price exhaustion. I'll be including the above chart occasionally in this letter as developments occur. The red and green arrows signify when a Demark Buy (green) or Sell (red) Setup pattern is completed on either a daily or weekly chart of one of the primary equity indices (S&P 500, Dow Jones Industrial, Nasdaq 11, and Russell 2000).

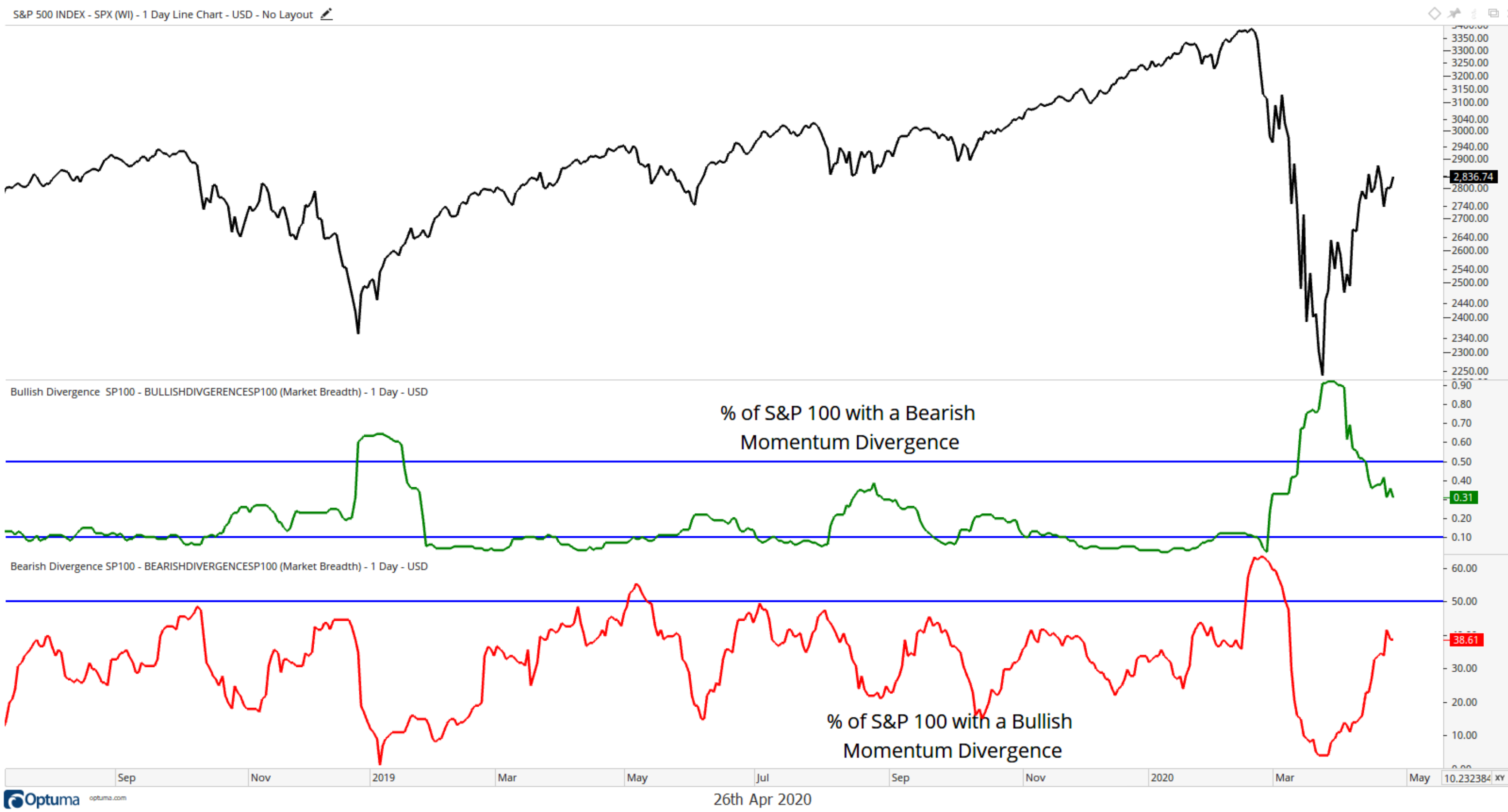
Over the next two pages I'll be showing a study on the percentage of S&P 500 stocks trading above their respective 50-day moving average. Currently, we have 39% of stocks above their intermediate-term moving average, a nice improvement from less than 10% less than a month ago. But is this enough? Not quite. The above green lines show when we've gone from less than 10% to over 40%. On the right is a chart of 2008-2011, notice this occurred several times during the '08 bear market, with the market stopping at the 200-day MA and also in 200 and 2011. The right chart shows 2015 to current. In 2015 we saw a move above 40% and price whipsawed around its 200-day MA before turning lower in 2016 and in '18 we saw a strong V-bottom with the 200-day breaking on the first test. Currently we are about 5% from the 200-day MA.

Here we have the same study as the prior page but from 1998 through 2003. Notice the initial move off the '98 low saw improvement of breadth as well as twice before the final low during the dot-com bear market - each unable to break the 200-day MA. I've said this several times in prior letters, that the 200-day MA is going to be a critical level for SPX to clear in order to confirm the improvements that have been made in market internals.



From a sector leadership, we saw good improvement over the last two weeks.

With the move up in equity prices on Friday the 10-day average of S&P 500 advances-declines went negative. You'd expect if stocks were rising then you'd have more advances than declines, but we didn't finish in such a position unfortunately. Going back to 2000, I've plotted red arrows on previous occurrences we've seen the 10-day average of the A-D go negative when the S&P 500 was under its 200-day moving average but finishing above its 50-day MA. As you can see, this is a regular development during the 2000 and 2008 bear markets and also happened at the counter-trend peak in 2015. But also note it occurred just after the 2002 and 2009 lows as well, with the S&P cutting right through its 200-day MA soon after. Another reason, the 200-MA is an important level to watch.



While we often look at momentum divergences on indices on their own, I've developed a breadth tool that looks at the percentage of stocks within indices and sectors that are showing bearish or bullish divergences. This can be useful data, when more than half to the underlying index (or sector) has a bearish or bullish divergence we often see a trend change develop. Above is an example showing the % for S&P 100 stocks, notice more than 60% had a bearish momentum divergence coming into the peak in the S&P 500 and almost 90% had a bullish divergence just before the March bottom.

You'll be seeing more of these types of charts be included in the letter.

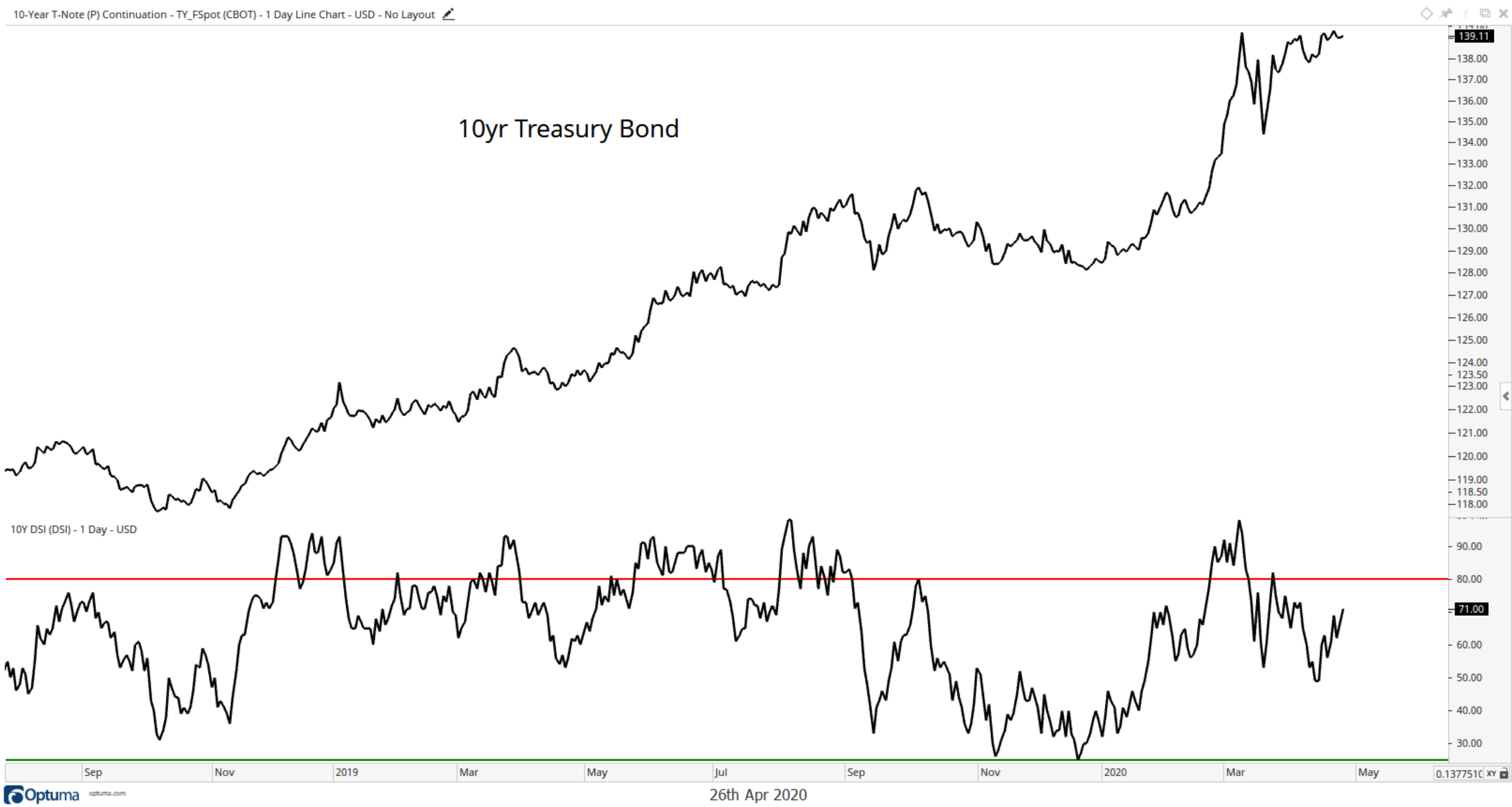
1 Day - Watch List - No Layout

Market	% Bullish	5MA	History
Mexican Peso DSI	12	19.6	
Heating Oil DSI	13	11.6	
Cocoa DSI	15	21.2	
Swiss Franc DSI	18	21.4	
Sugar DSI	21	23.6	
Cattle DSI	21	24	
Gasoline DSI	22	18.2	
Corn DSI	22	17.4	
Natural Gas DSI	25	29.60	
Lumber DSI	25	32.20	
Lean Hog DSI	25	19.4	
Euro DSI	25	28.20	
Crude Oil DSI	28.00	16	
Coffee DSI	28.00	31.40	
CRB Index DSI	30.00	18	
Palladium DSI	33.00	34.80	
Orange Juice DSI	40.00	33.80	

1 Day - Watch List - No Layout

Code	% Bullish	5MA	History
Cotton DSI	42.00	39.60	
SPX DSI	45.00	43.60	
New Zealand Dollar DSI	46.00	43.80	
British Pound DSI	49.00	45.60	
Nasdaq DSI	51.00	49.40	
VIX DSI	52.00	56.00	
Platinum DSI	53.00	48.20	
Silver DSI	55.00	49.40	
Copper DSI	58.00	51.60	
Australian Dollar DSI	58.00	53.00	
Wheat DSI	61.00	61.80	
Nikkei DSI	64.00	56.60	
5YR DSI	65.00	64.20	
10Y DSI	71.00	65.80	
US Dollar DSI	73.00	71.20	
EuroDollar DSI	75.00	73.00	
Gold DSI	78.00	69.80	

Above is the DSI score for each of the futures markets.


10-Year T-Note (P) Continuation - TY_FSpot (CBOT) - 1 Day Line Chart - USD - No Layout
10yr Treasury Bond
139.11
10Y DSI (DSI) - 1 Day - USD
71.00
Sep
Nov
2019
Mar
May
Jul
Sep
Nov
2020
Mar
May
26th Apr 2020
Optuma


S&P 500 INDEX - SPX (WI) - 1 Day Line Chart - USD - No Layout
S&P 500
SPX DSI (DSI) - 1 Day - USD
2,836.74
45.00
Mar
May
Jul
Sep
Nov
2020
Mar
Optuma
26th Apr 2020


NASDAQ 100 Index - NDY (WI) - 1 Day Line Chart - USD - No Layout
Nasdaq 100
8,786.60
Nasdaq DSI (DSI) - 1 Day - USD
51.00
Apr
May
Jun
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Dec
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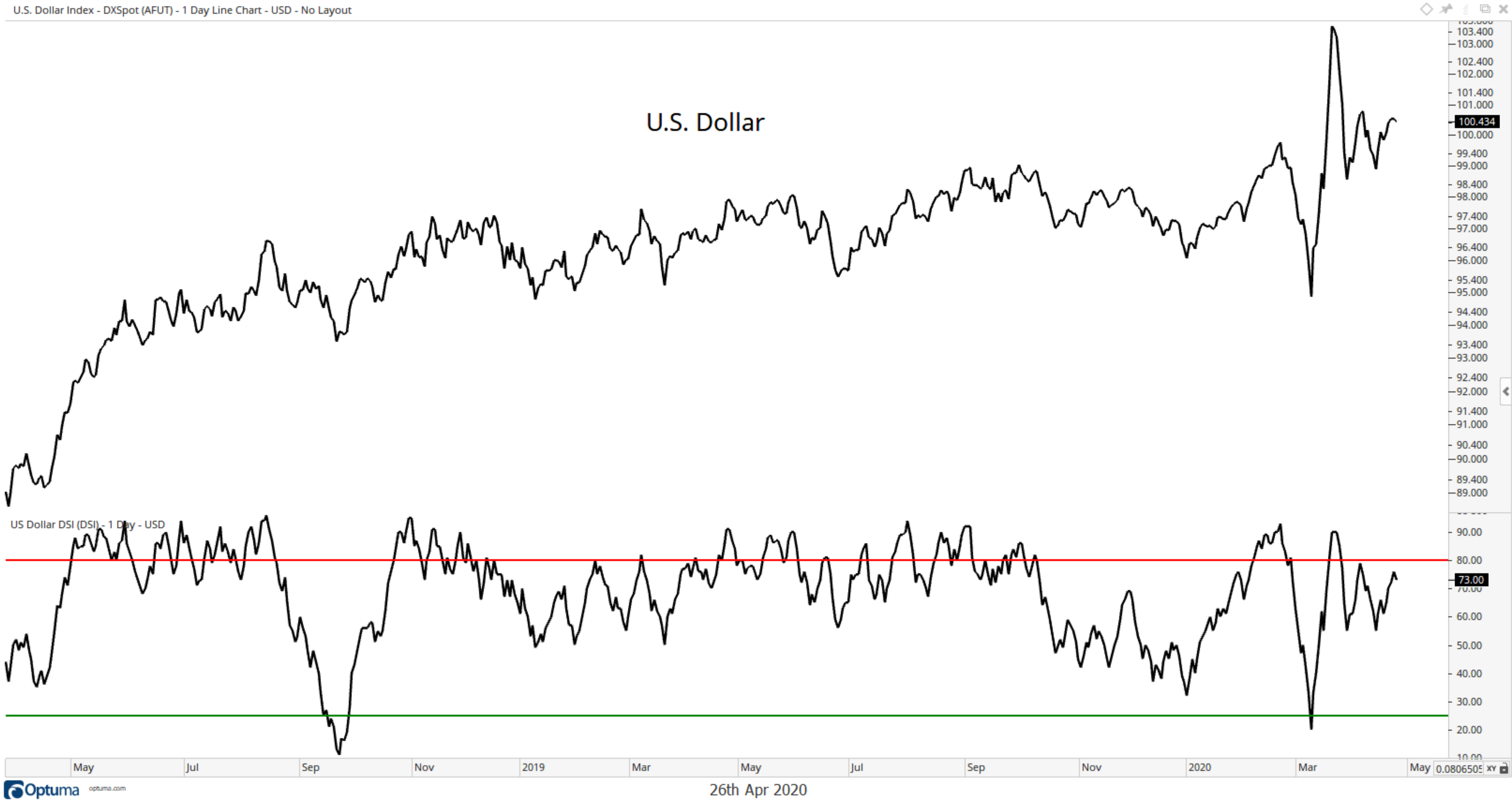
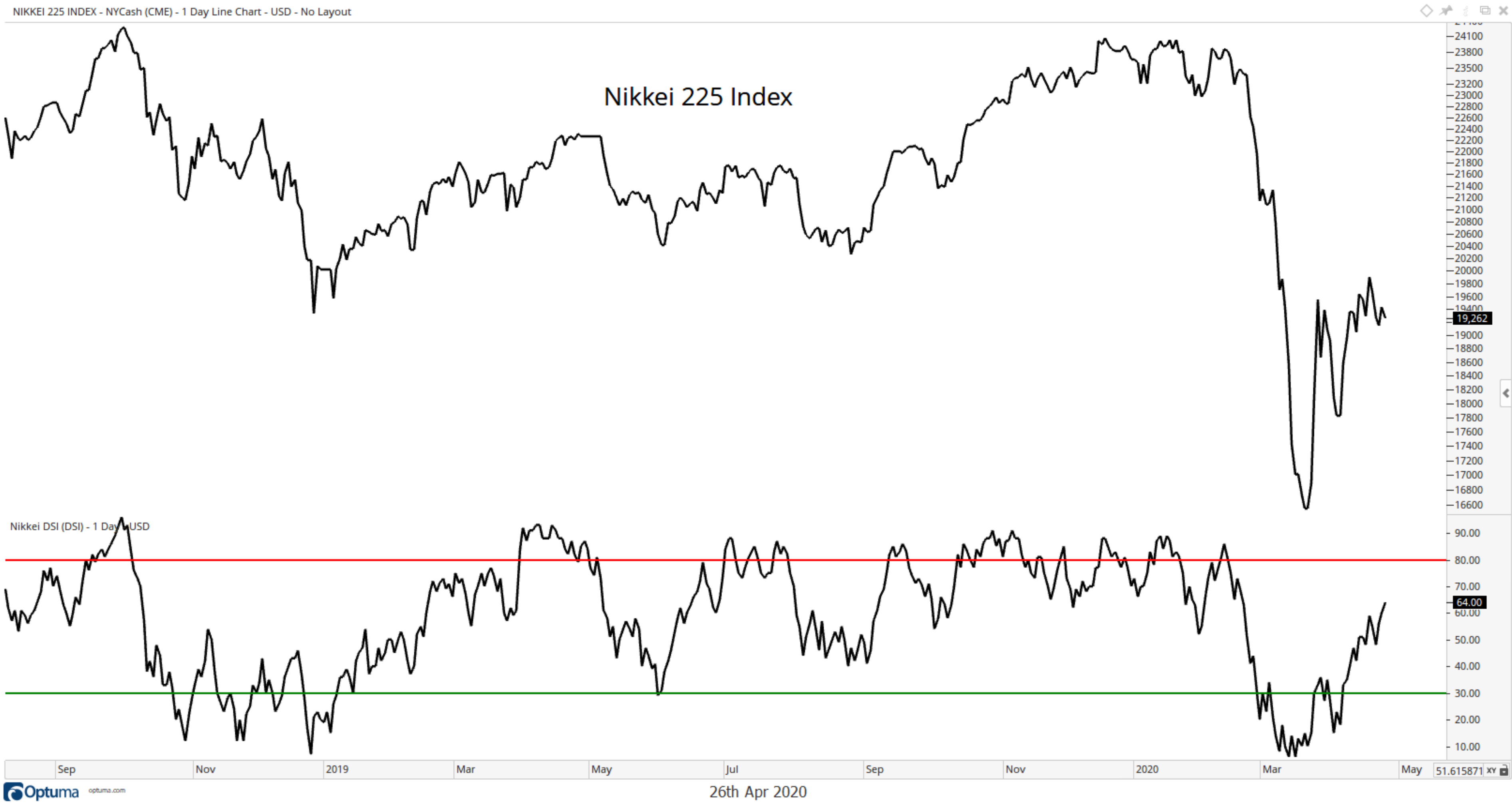
Feb
Mar
Apr
Optuma
26th Apr 2020

Daily Sentiment Index Gold

Daily Sentiment Index U.S. Dollar



Daily Sentiment Index VIX


NIKKEI 225 INDEX - NYCash (CME) - 1 Day Line Chart - USD - No Layout
Nikkei 225 Index
19,262
Nikkei DSI (DSI) - 1 Day - USD
64.00
Sep
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May
26th Apr 2020
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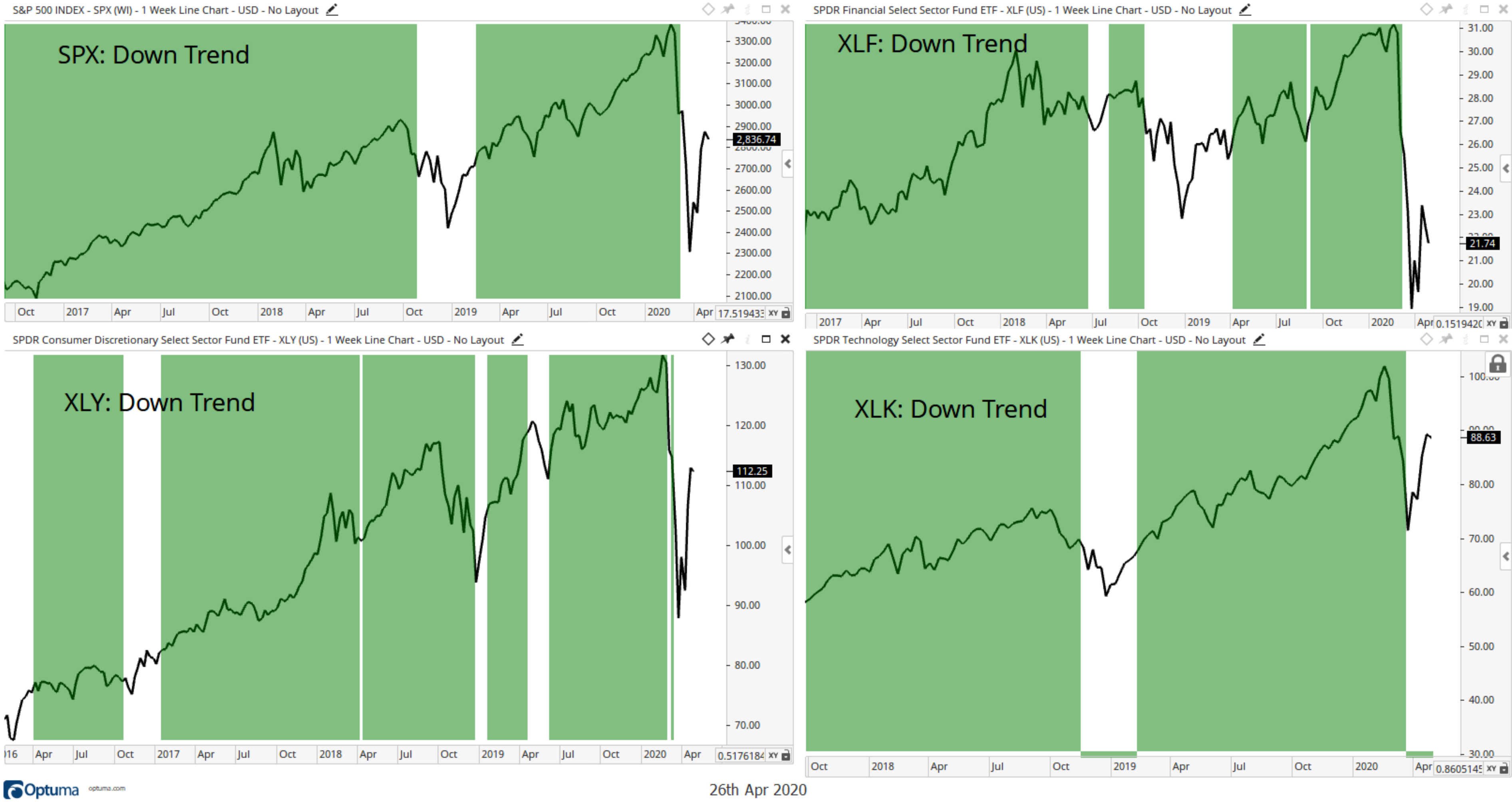
S&P 500 INDEX - SPX (WI) - 1 Week Line Chart - USD - No Layout
SPX: Down Trend
2,836.74
SPDR Financial Select Sector Fund ETF - XLF (US) - 1 Week Line Chart - USD - No Layout
XLF: Down Trend
21.74
SPDR Consumer Discretionary Select Sector Fund ETF - XLY (US) - 1 Week Line Chart - USD - No Layout
XLY: Down Trend
112.25
SPDR Technology Select Sector Fund ETF - XLK (US) - 1 Week Line Chart - USD - No Layout
XLK: Down Trend
88.63
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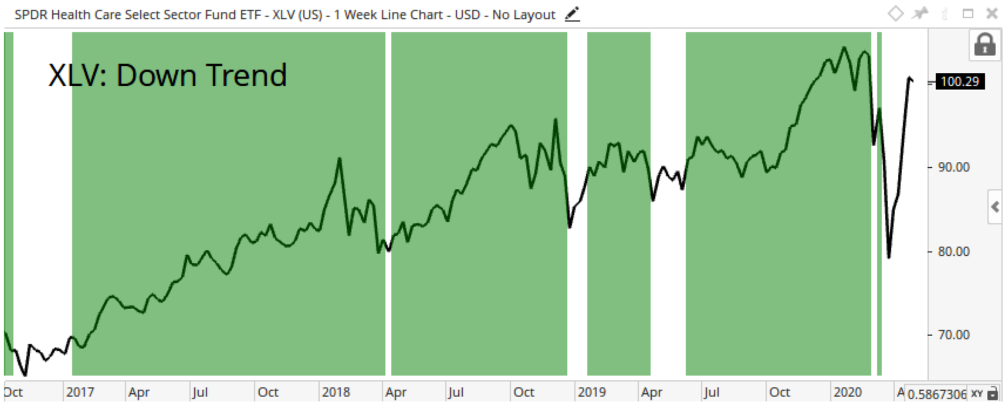
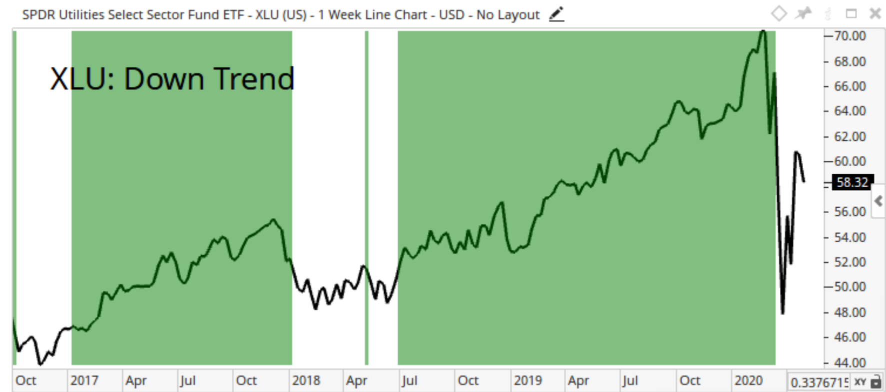
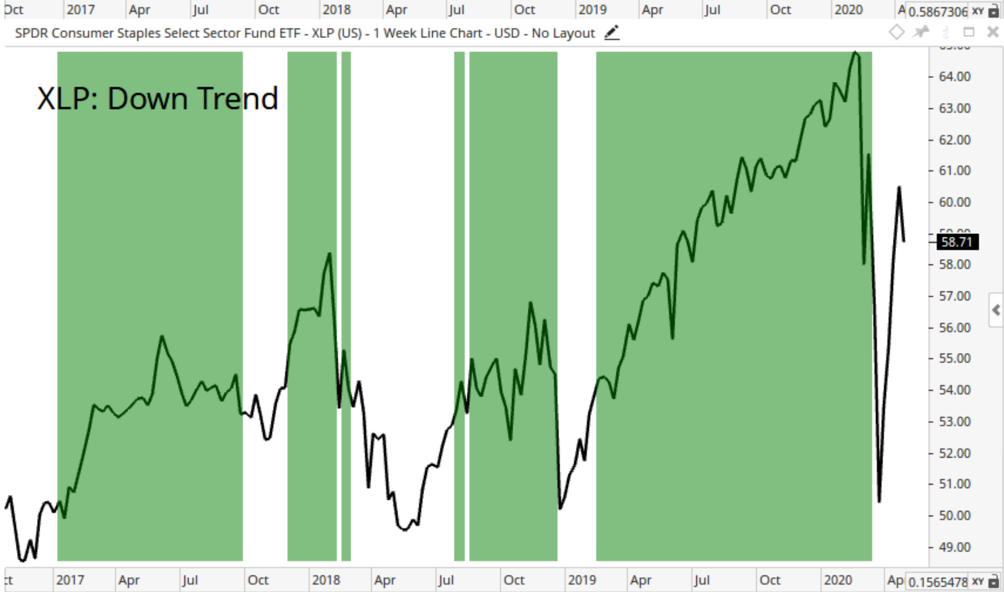
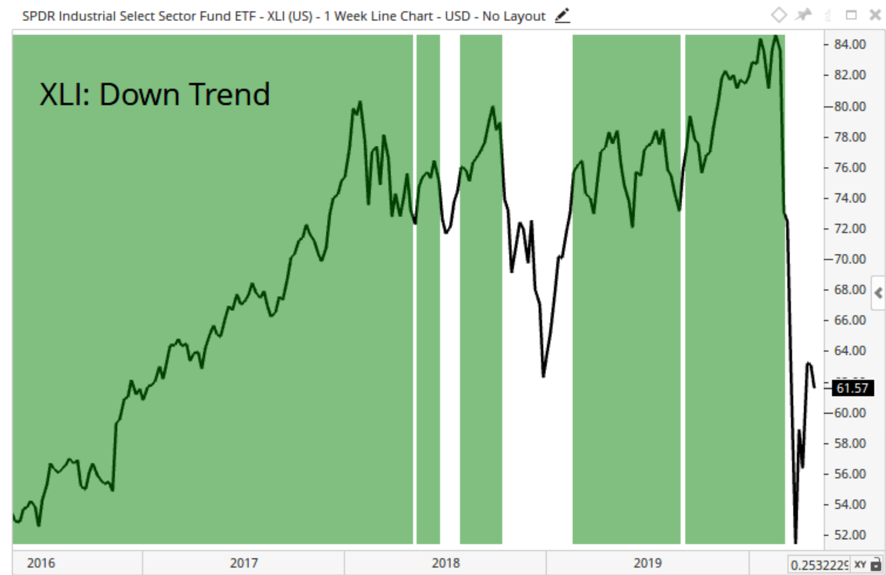
26th Apr 2020

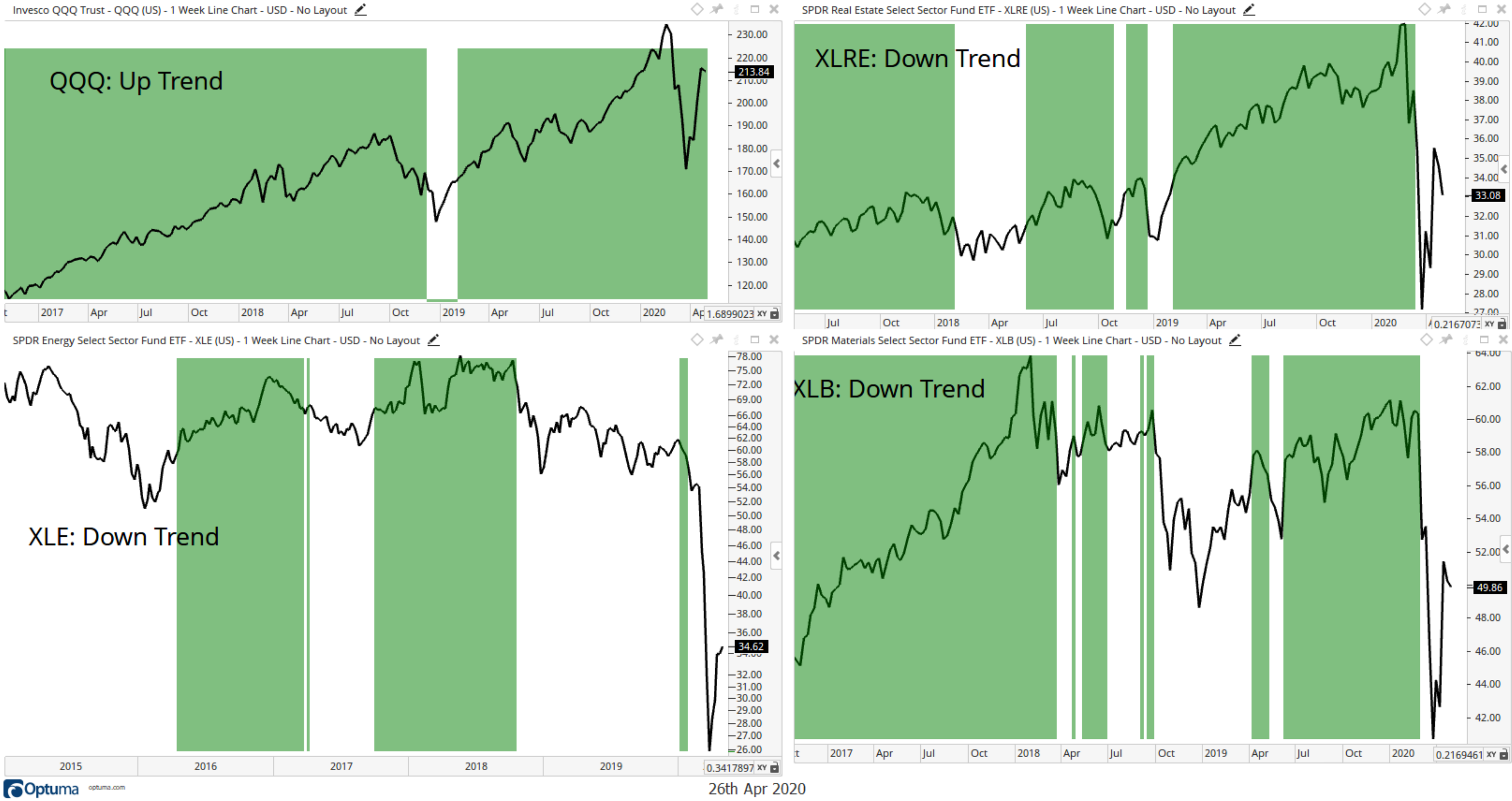








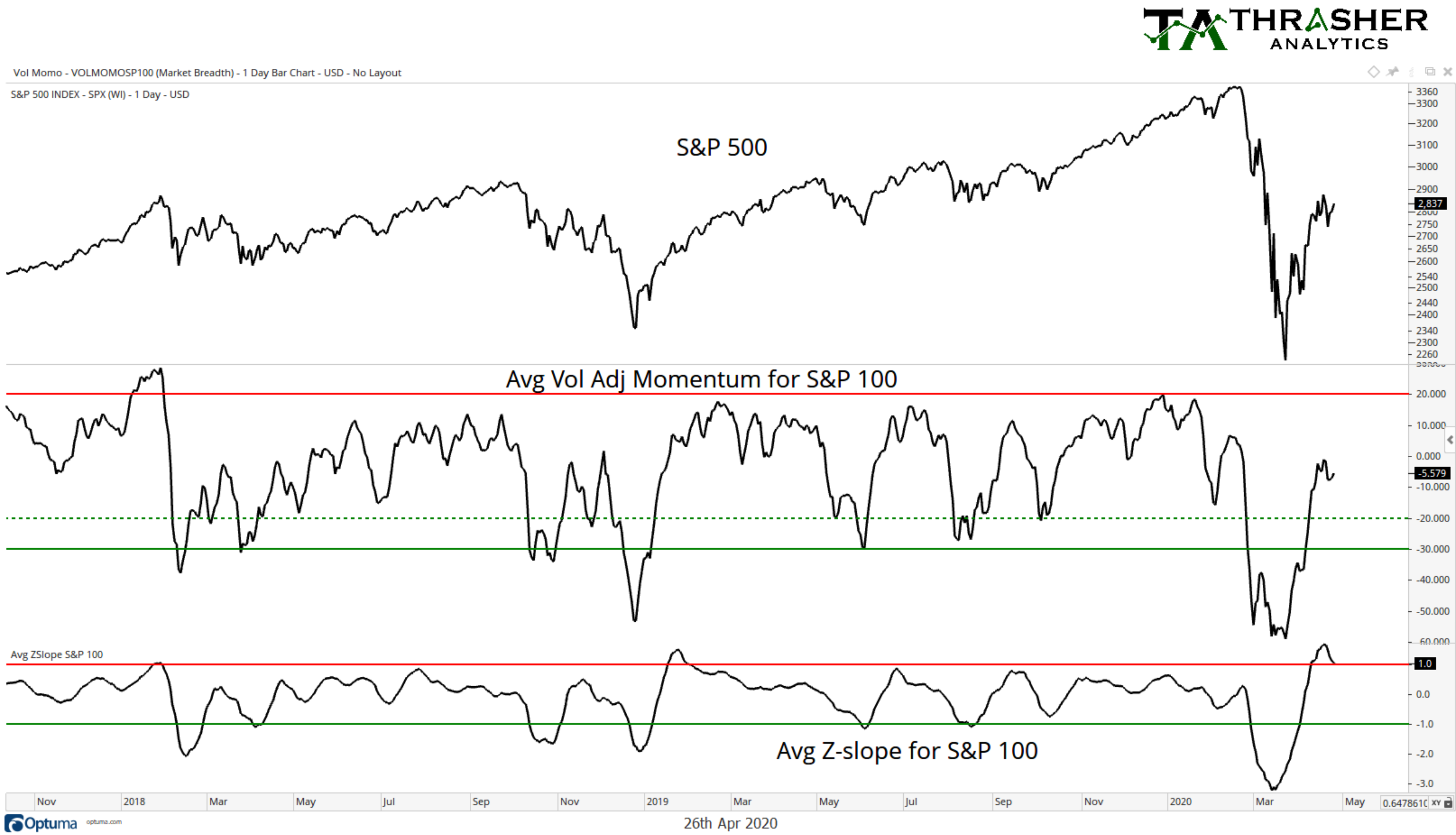
Optuma
26th Apr 2020


Invesco QQQ Trust - QQQ (US) - 1 Week Line Chart - USD - No Layout
QQQ: Up Trend
213.84
SPDR Real Estate Select Sector Fund ETF - XLRE (US) - 1 Week Line Chart - USD - No Layout
XLRE: Down Trend
33.08
SPDR Energy Select Sector Fund ETF - XLE (US) - 1 Week Line Chart - USD - No Layout
XLE: Down Trend
34.62
SPDR Materials Select Sector Fund ETF - XLB (US) - 1 Week Line Chart - USD - No Layout
XLB: Down Trend
49.86
Optuma
26th Apr 2020

The following charts will become a regular installment for this, and future letters. Each page will include a daily and weekly chart with two indicators that are unique to Thrasher Analytics. With a focus on risk mitigation, the focus of these charts is on potential mean-reversion of each asset through the analysis of the two indicators described below.

Volatility-Adjusted Momentum (VaM: This is a spin on the traditional measures of momentum, taking into account the volatility of the underlying asset into the calculation. By adjusting for volatility we can get a better look at potential mean-reversion signals when risk/ reward becomes unbalanced towards 40 as 'overbought' or –40 as 'oversold.'

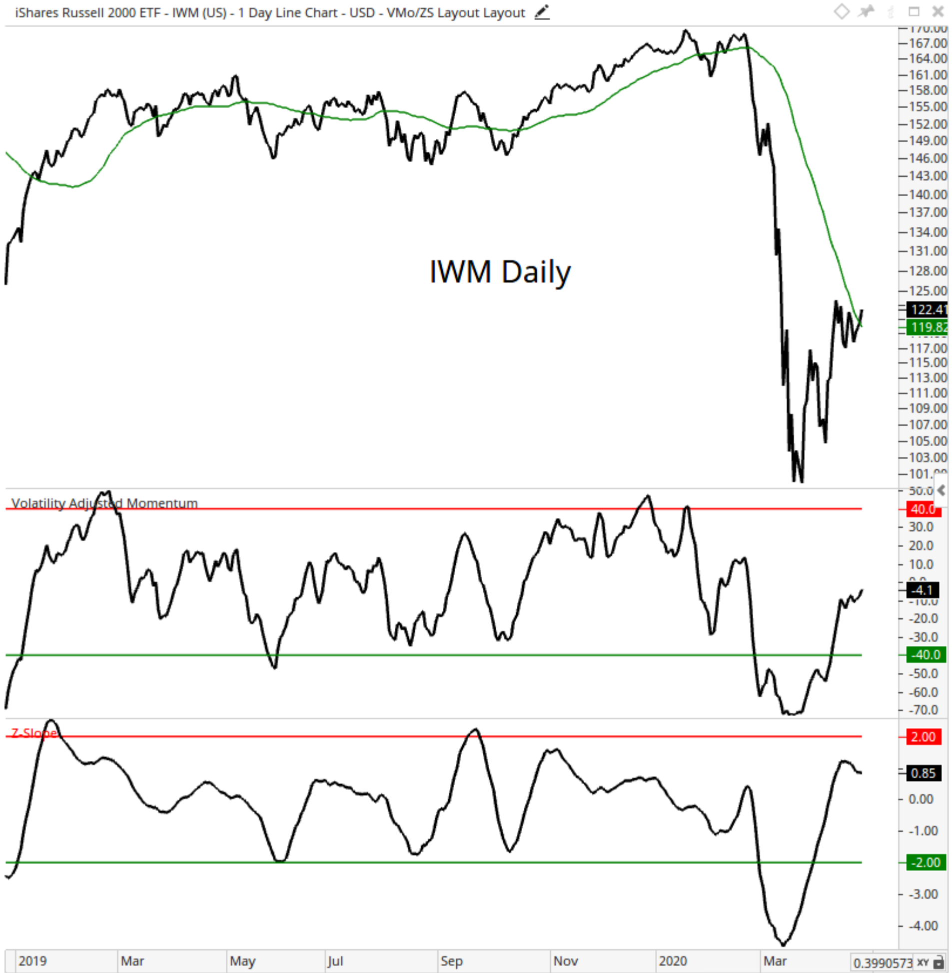
Z-Slope: This indicator takes two lookback periods, one long and one short, for calculating the slope and evaluates the z-score of the difference. This provides insight into whether the current slope of the trend fits within the long-term price history of the security. If a z-score breaks above 2, then the slope has gotten to upward sloping compared to its history. And the opposite is true when we get readings below –2, that the downward sloping trend has gotten 'oversold' compared to the asset's price history.

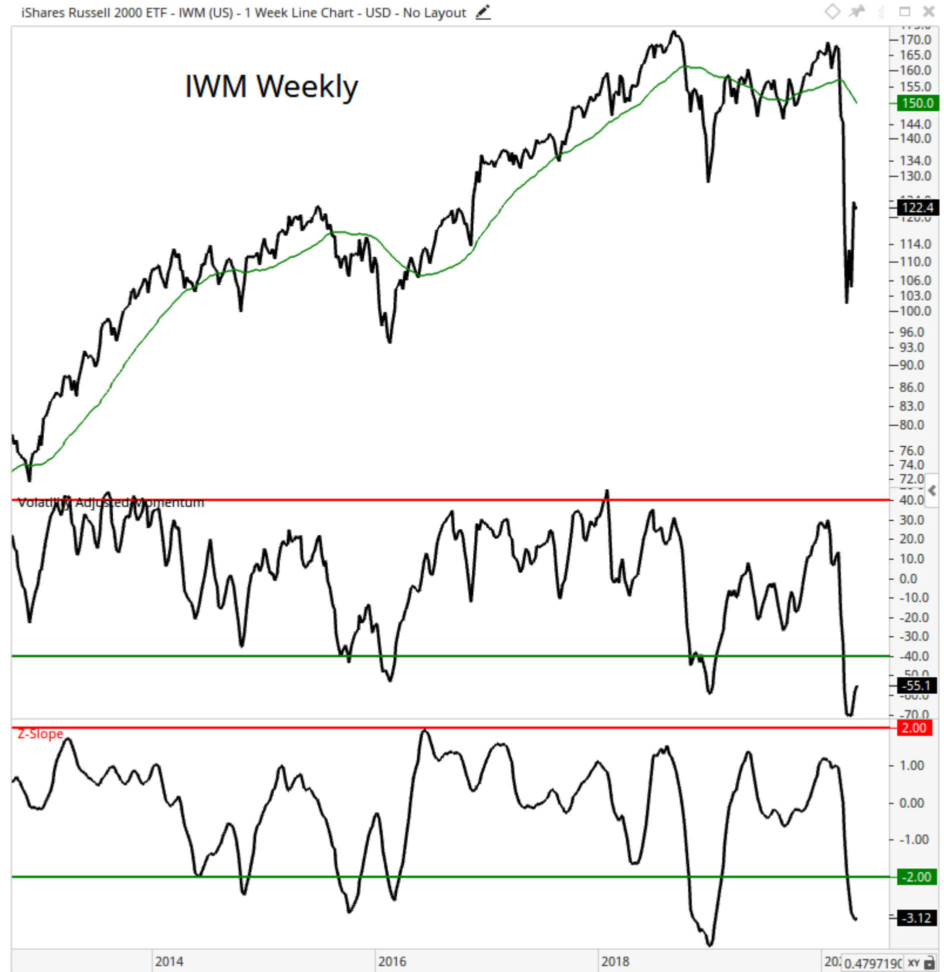


Above are the average Volatility Adjusted Momentum Indicator (VaM) and Z-slope scores for the S&P 100.

26th Apr 2020

IWM





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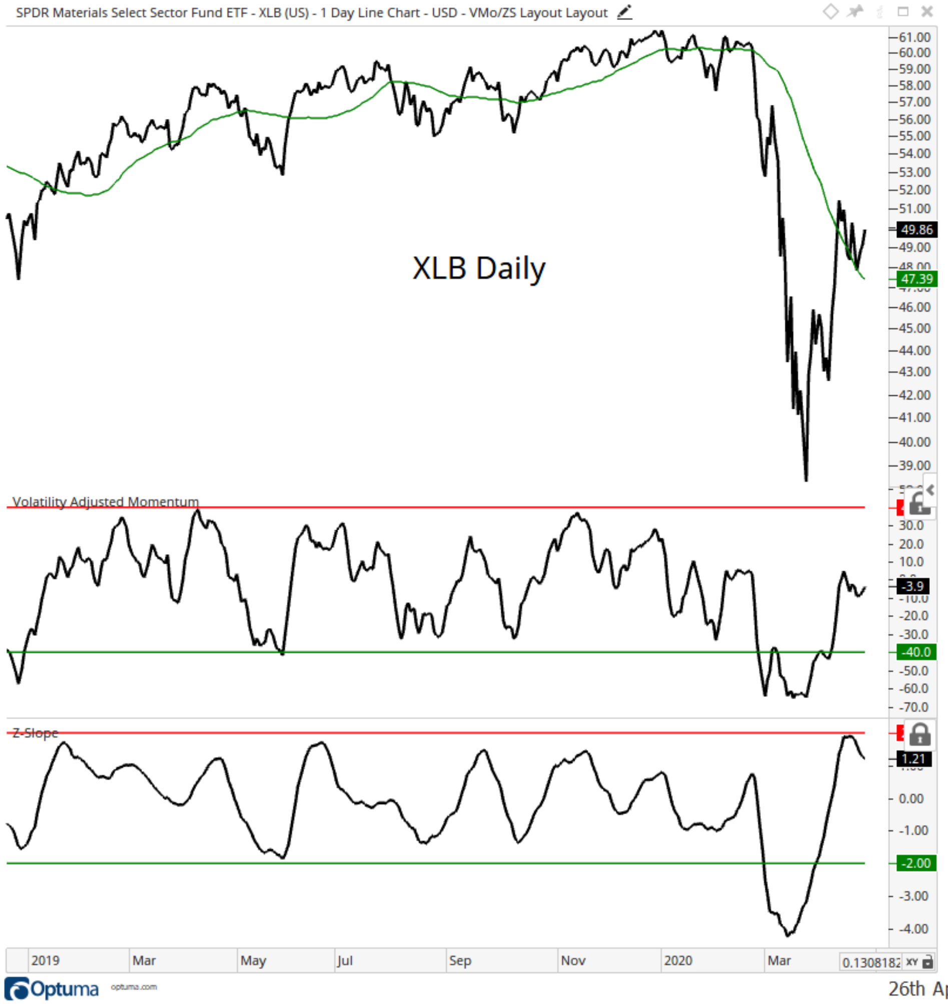
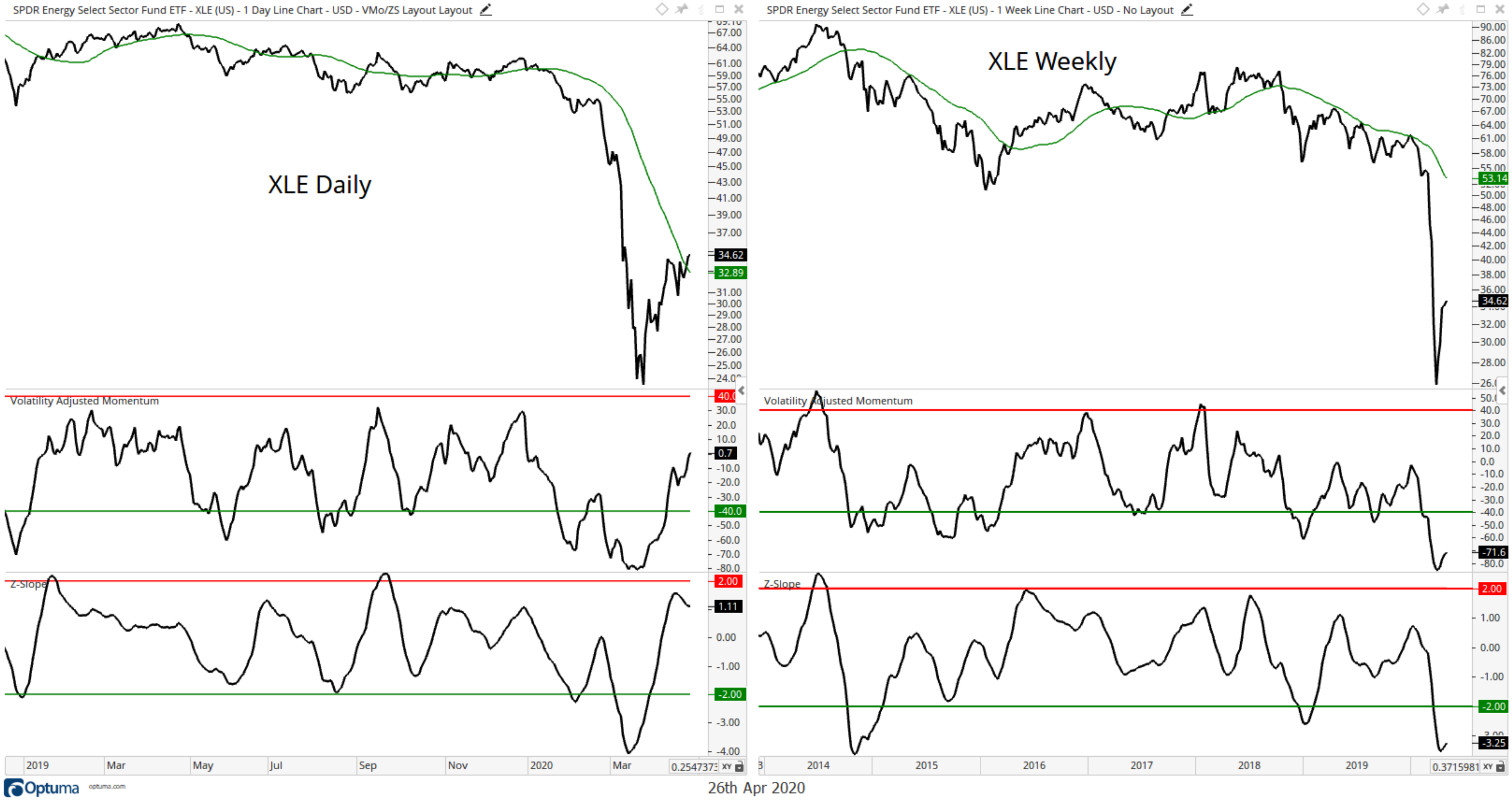
26th Apr 2020

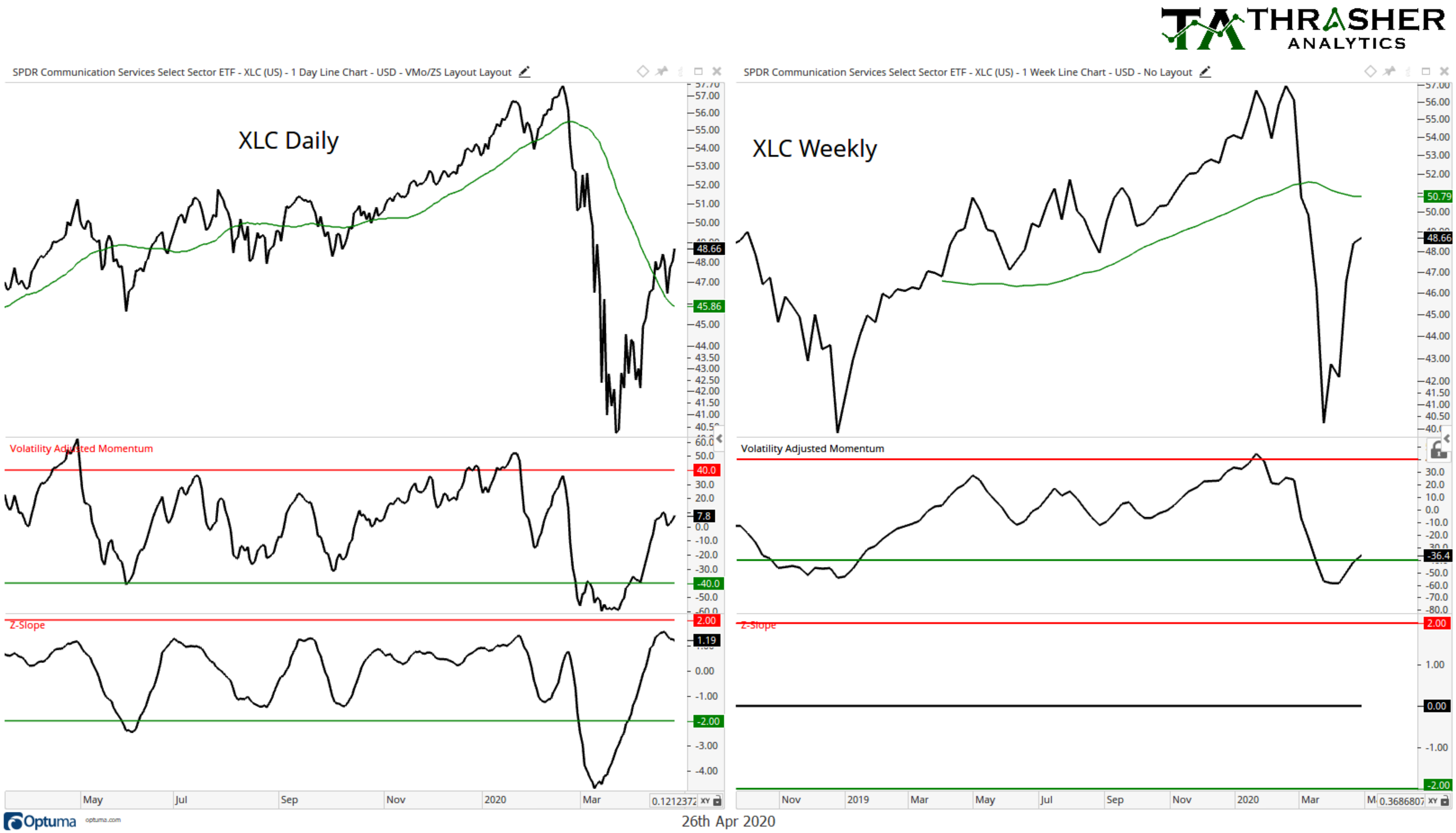
THRASHER ANALYTICS

XLB



26th Apr 2020


SPDR Energy Select Sector Fund ETF - XLE (US) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
XLE Daily
Volatility Adjusted Momentum
Z-Slope
SPDR Energy Select Sector Fund ETF - XLE (US) - 1 Week Line Chart - USD - No Layout
XLE Weekly
Volatility Adjusted Momentum
Z-Slope
Optuma
26th Apr 2020


THRASHER ANALYTICS
SPDR Communication Services Select Sector ETF - XLC (US) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
XLC Daily
Volatility Adjusted Momentum
Z-Slope
May
Jul
Sep
Nov
2020
Mar
SPDR Communication Services Select Sector ETF - XLC (US) - 1 Week Line Chart - USD - No Layout
XLC Weekly
Volatility Adjusted Momentum
Z-Slope
Nov
2019
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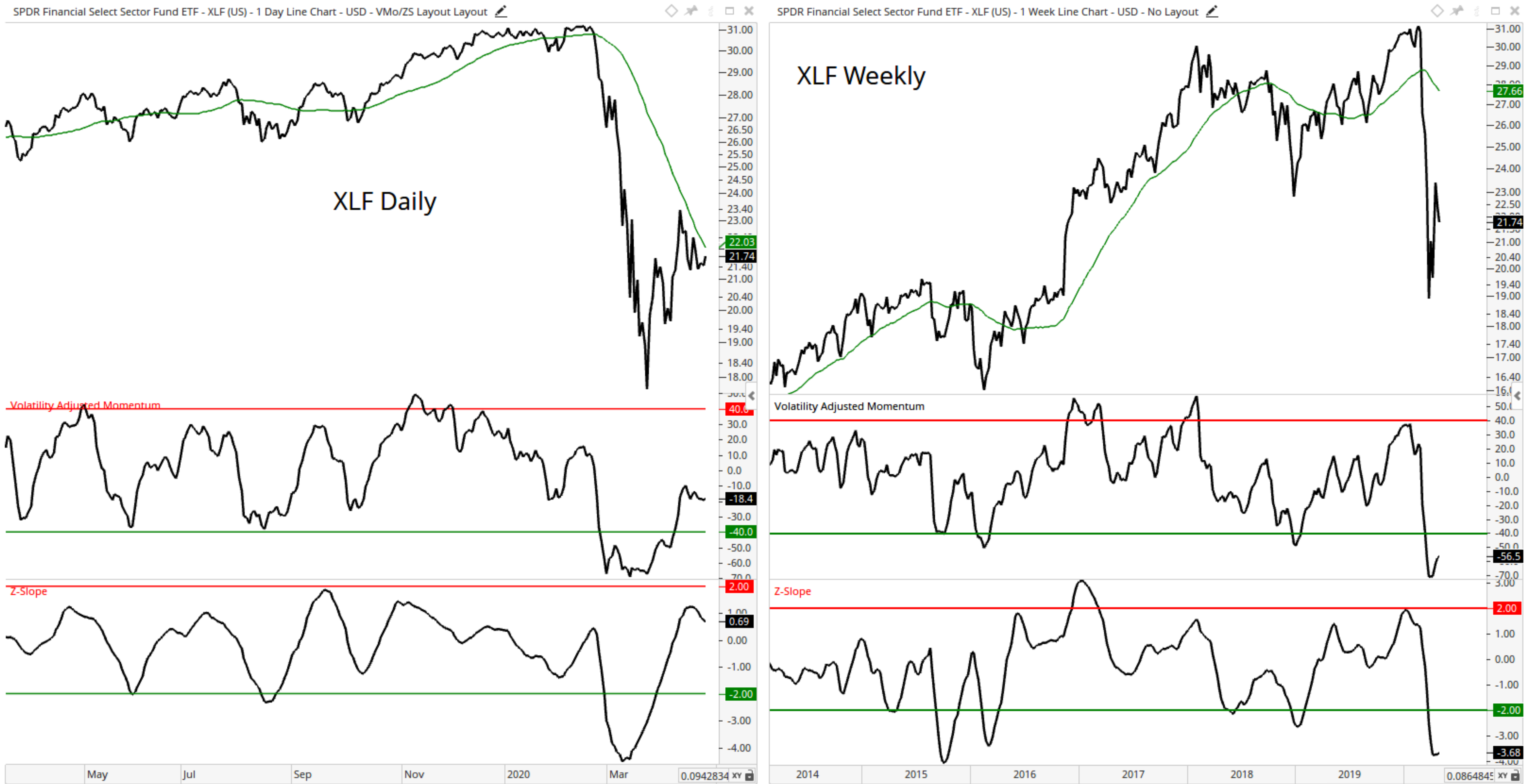
Optuma
26th Apr 2020



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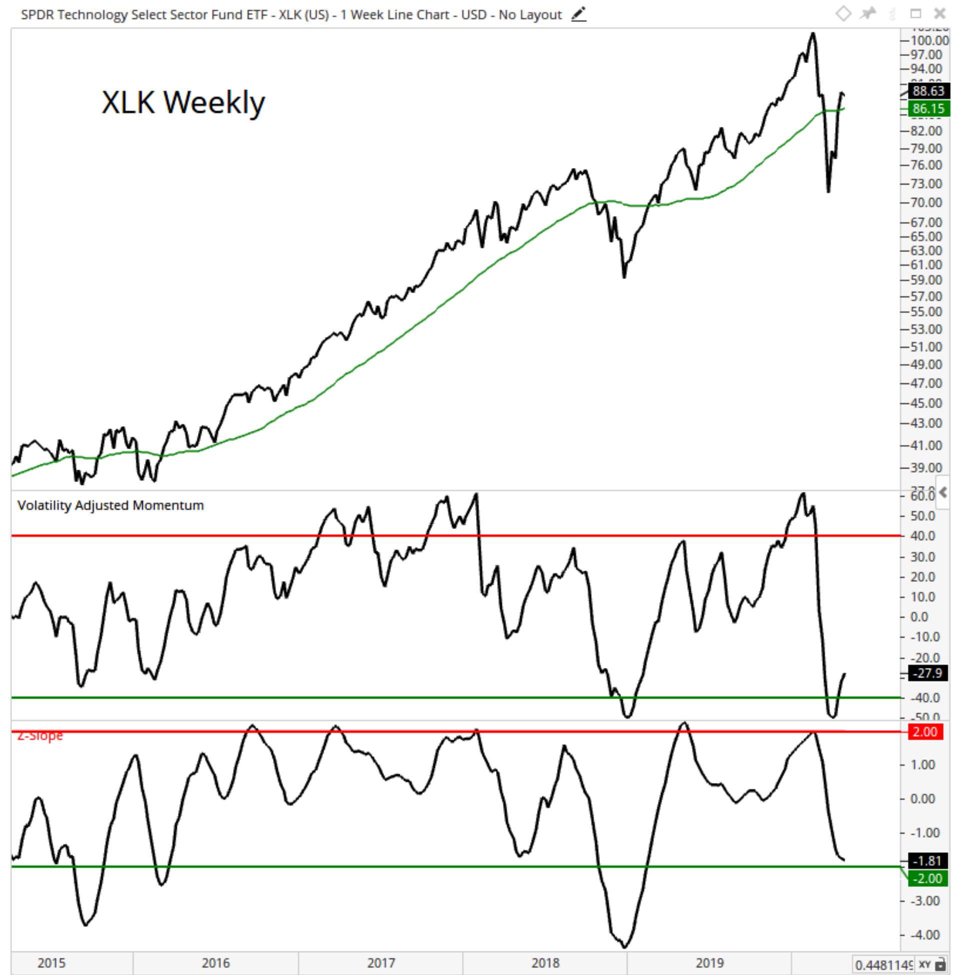

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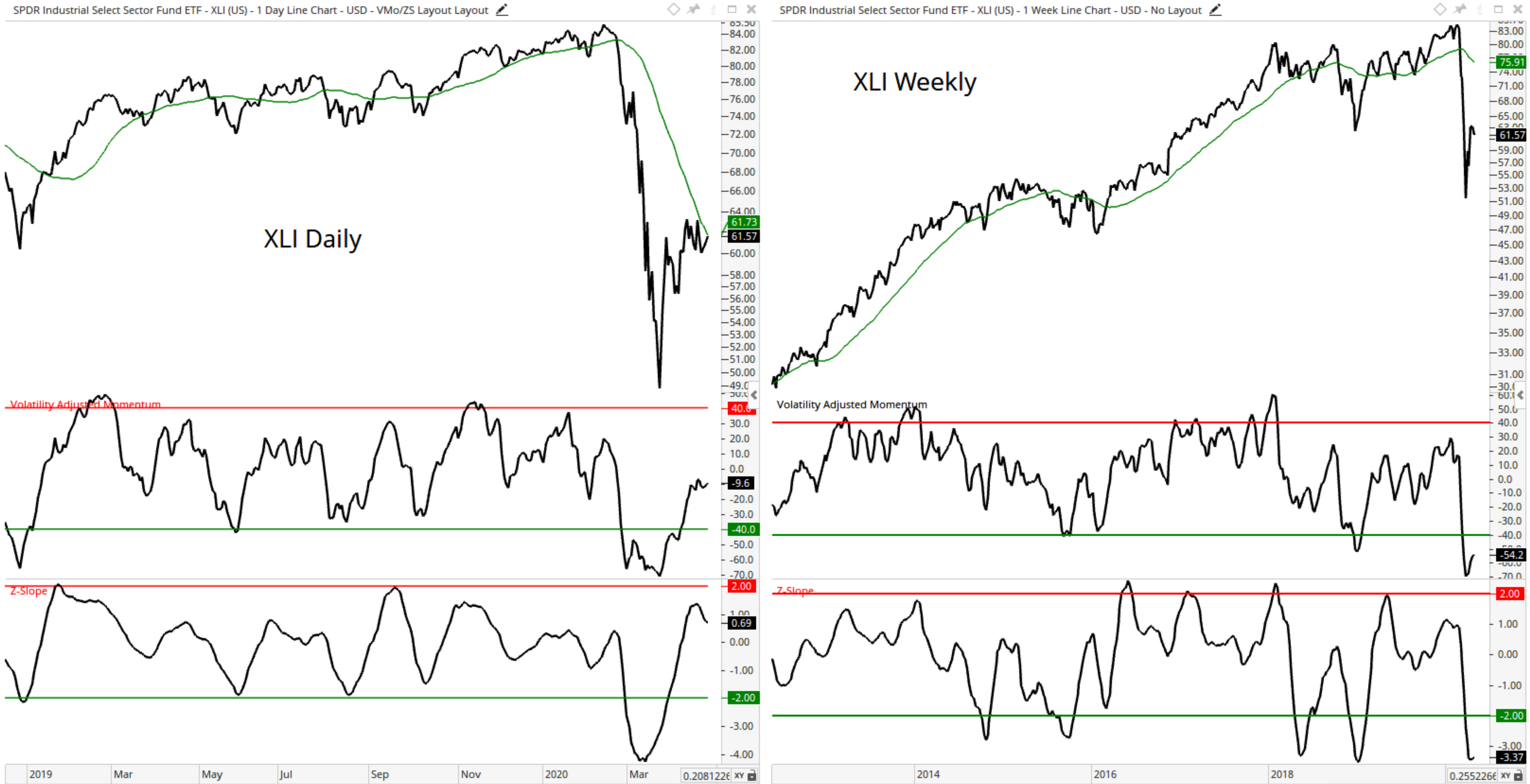

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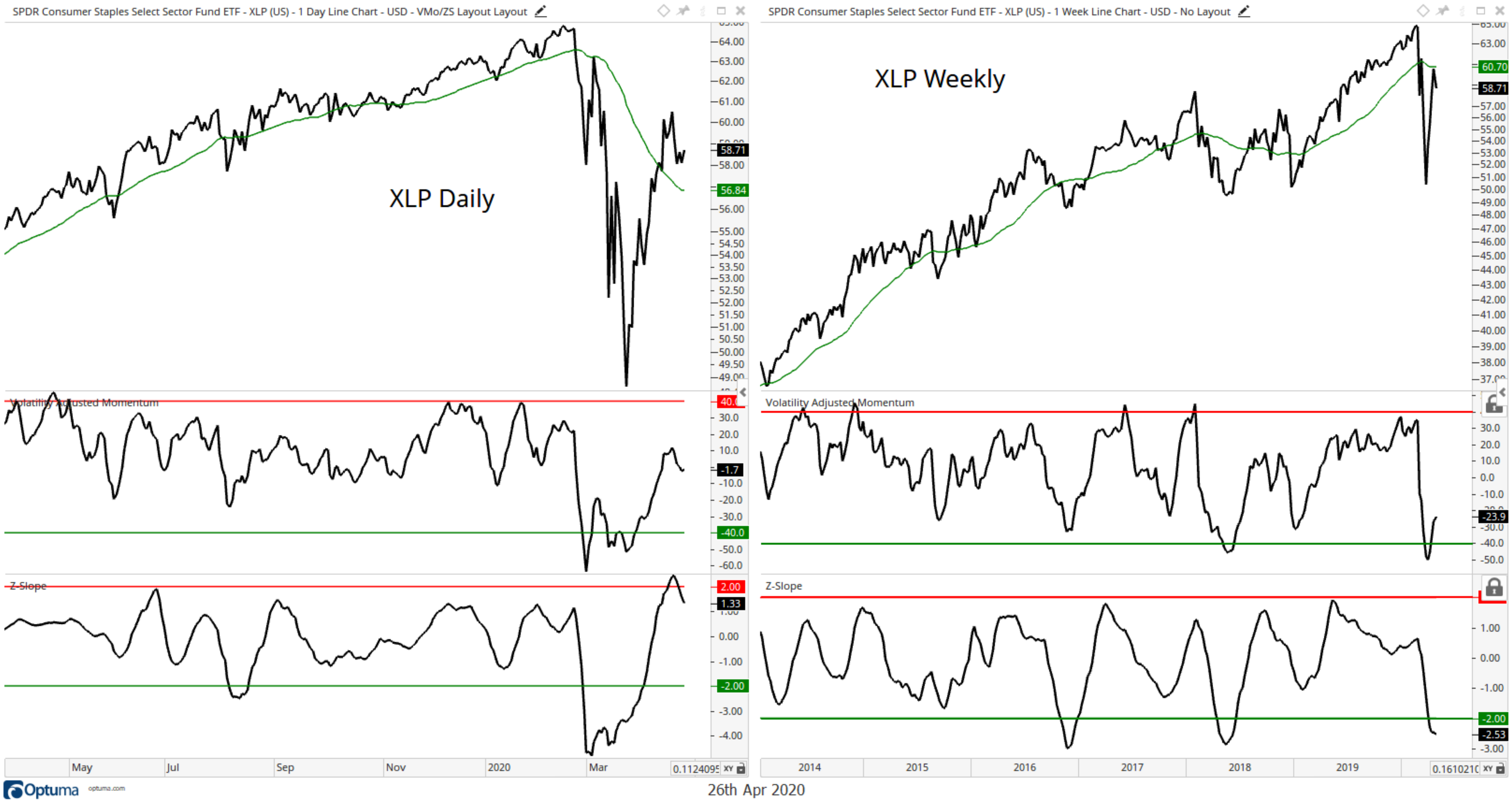
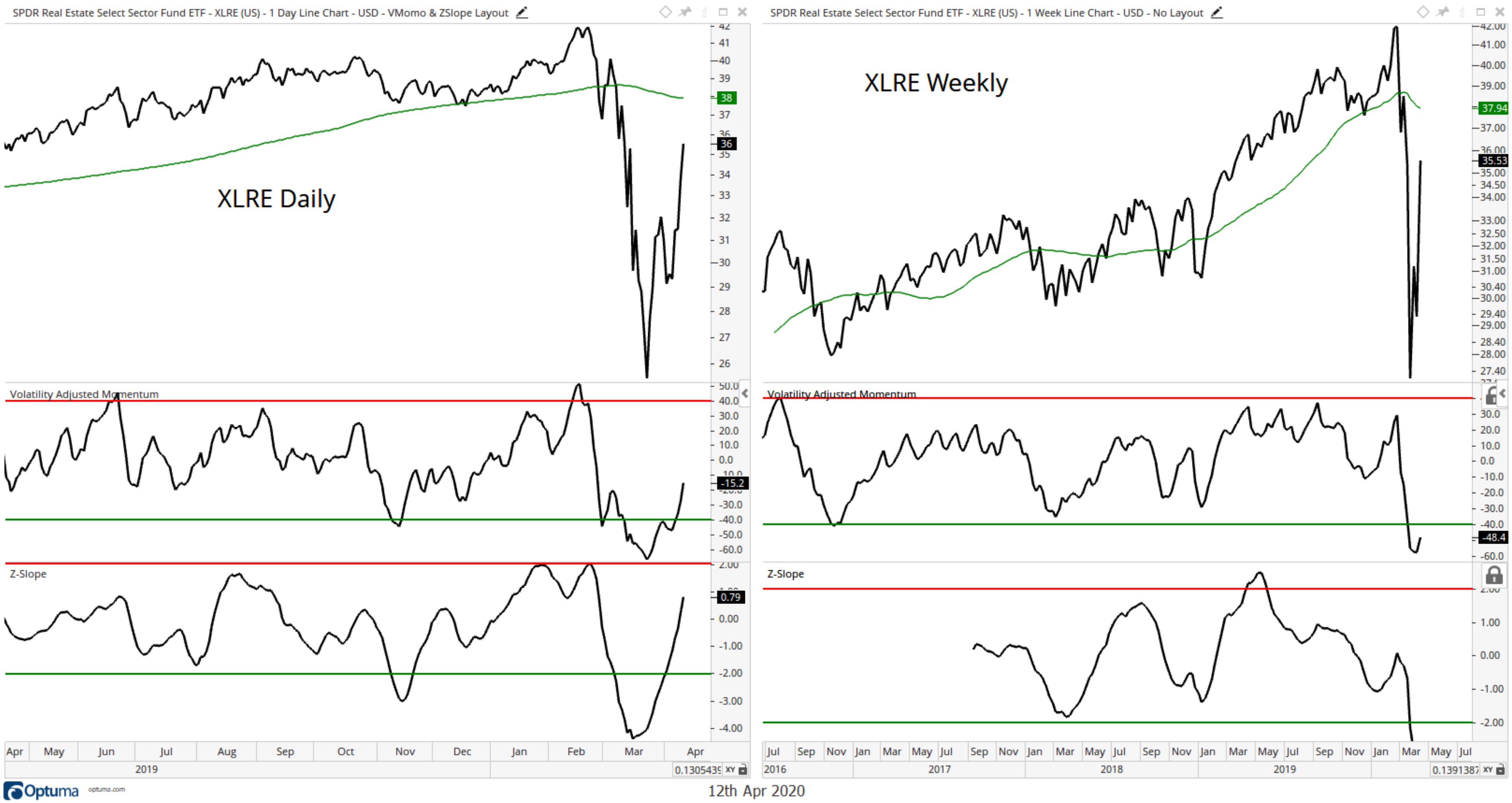


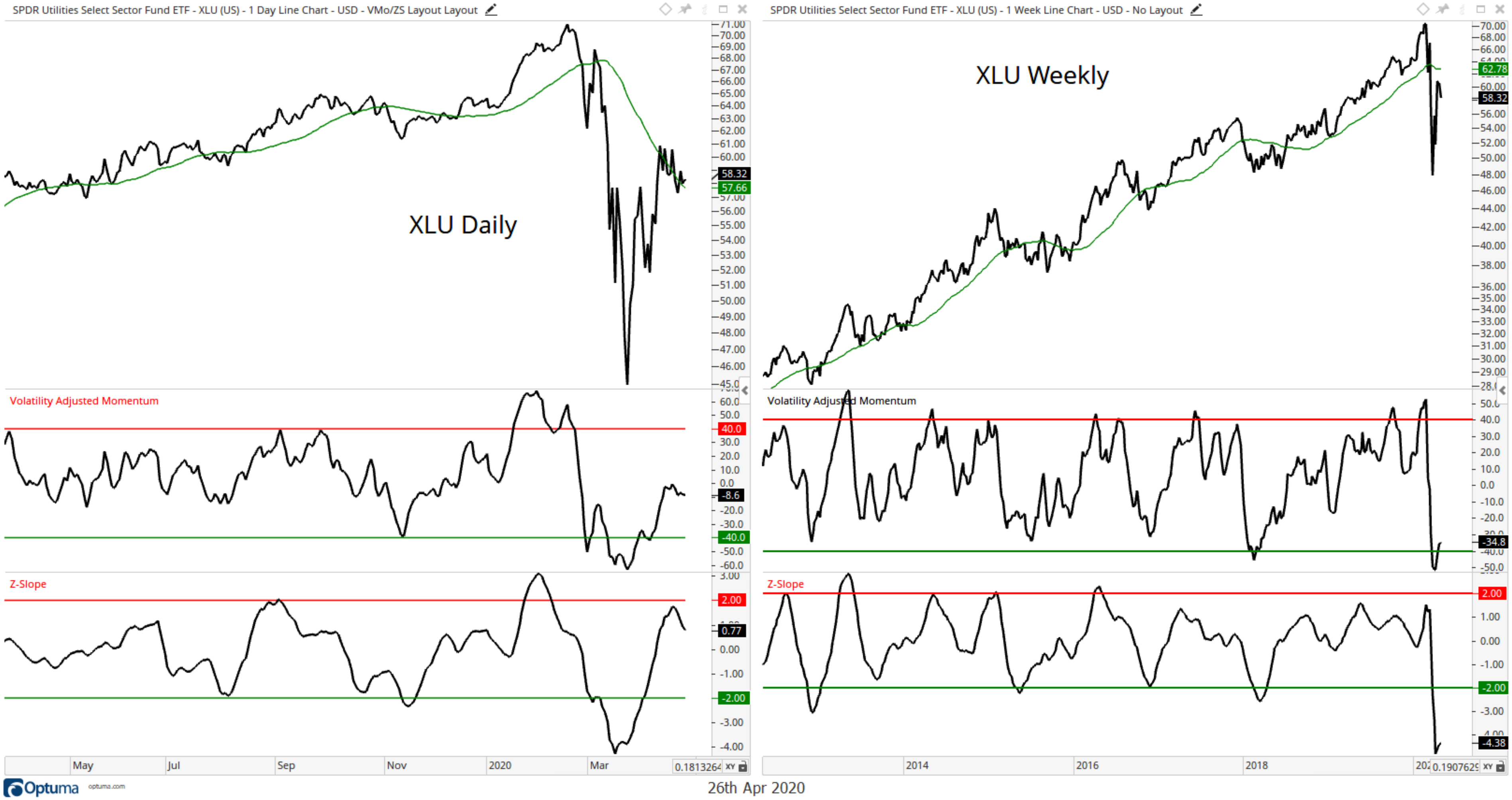
26th Apr 2020

XLRE

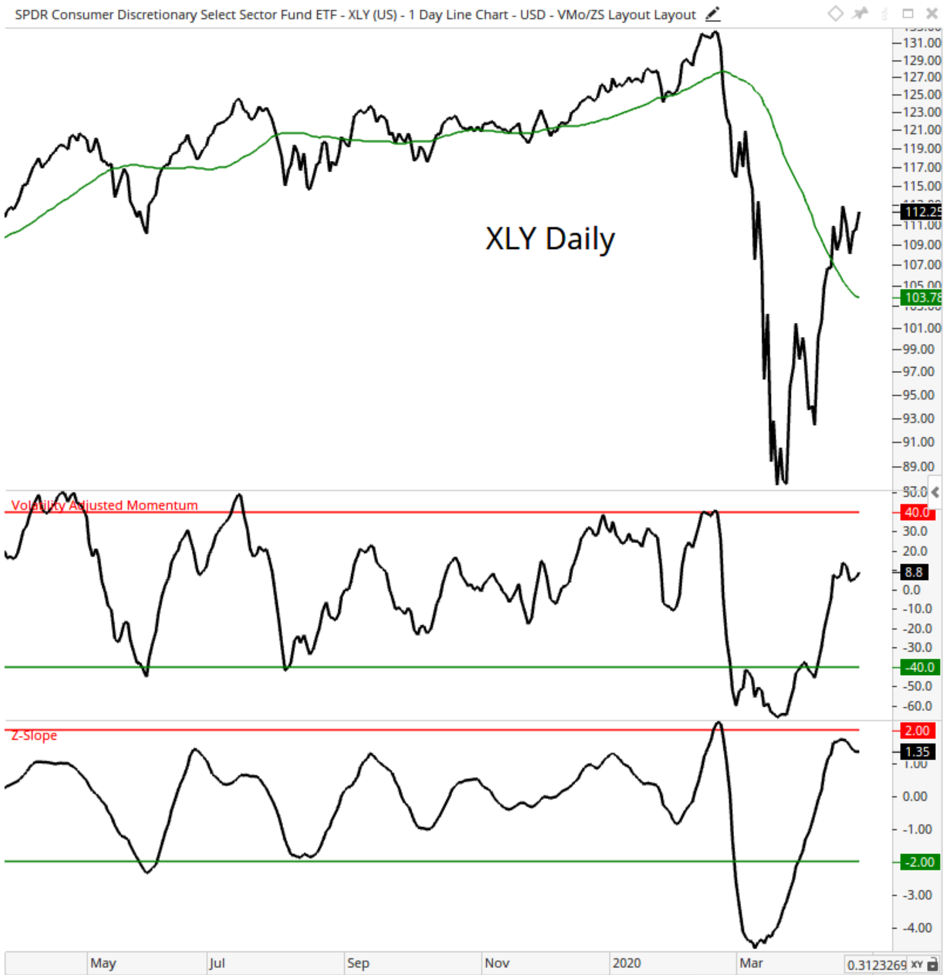


12th Apr 2020

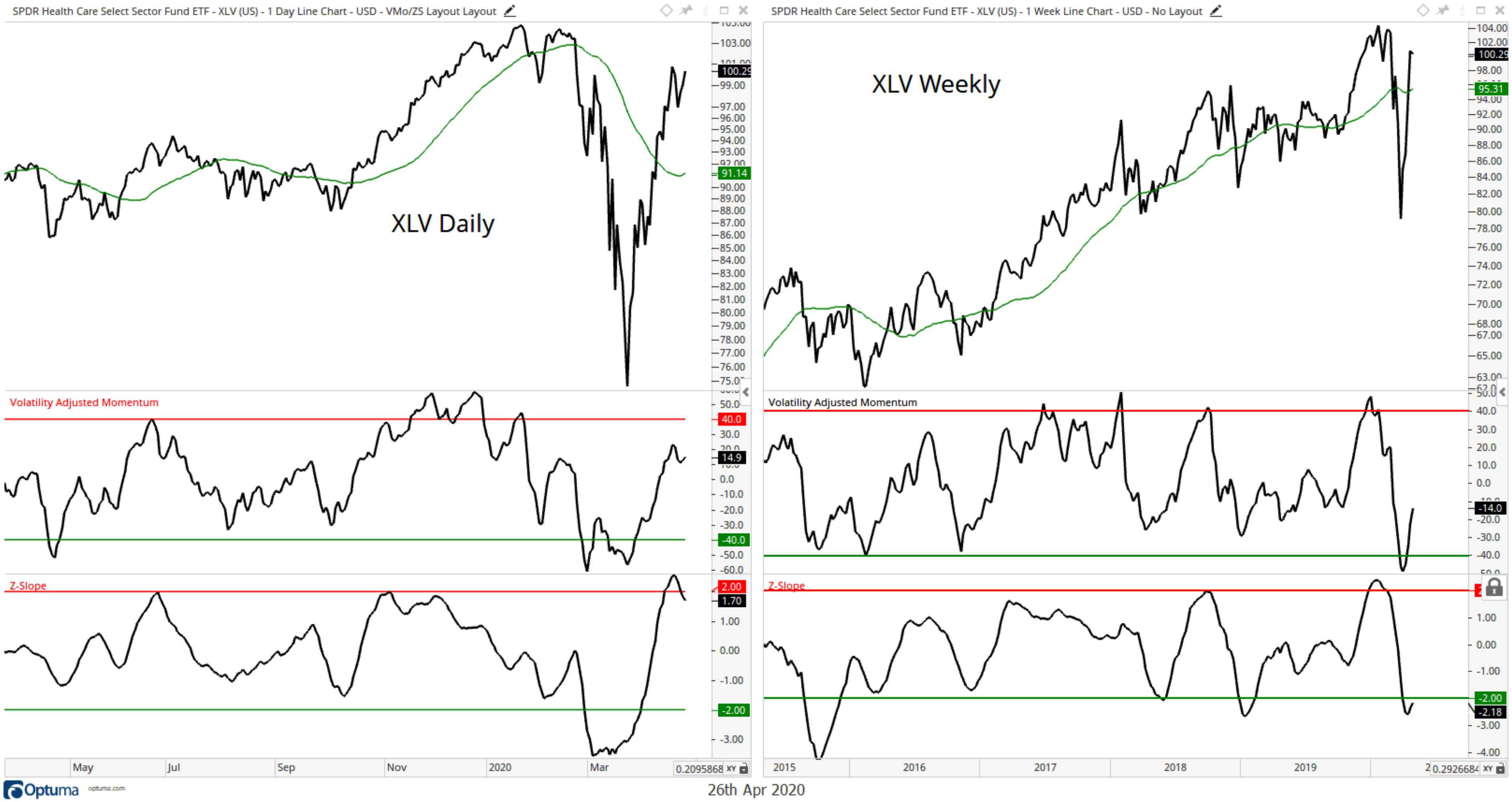
XLU



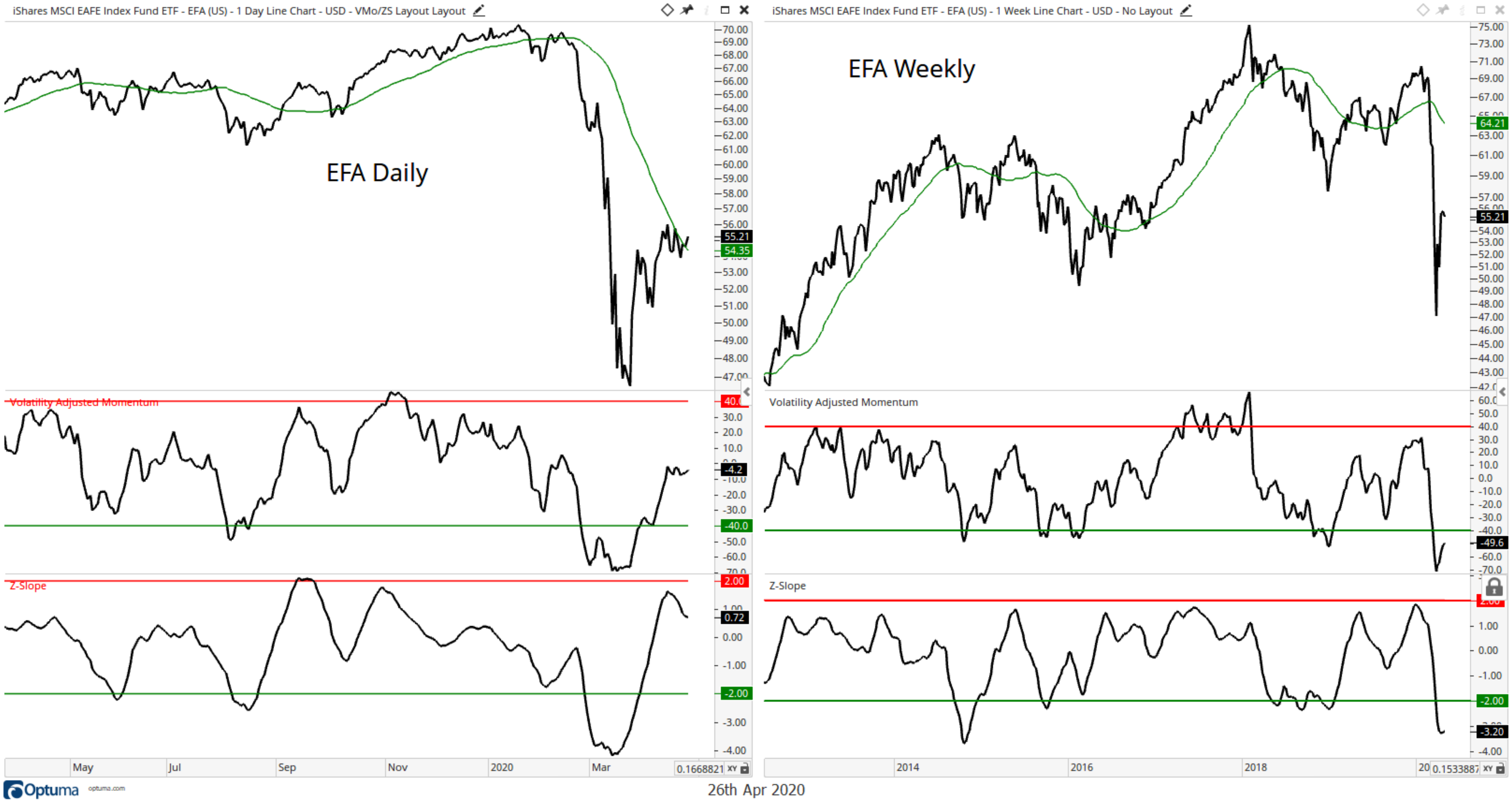
26th Apr 2020

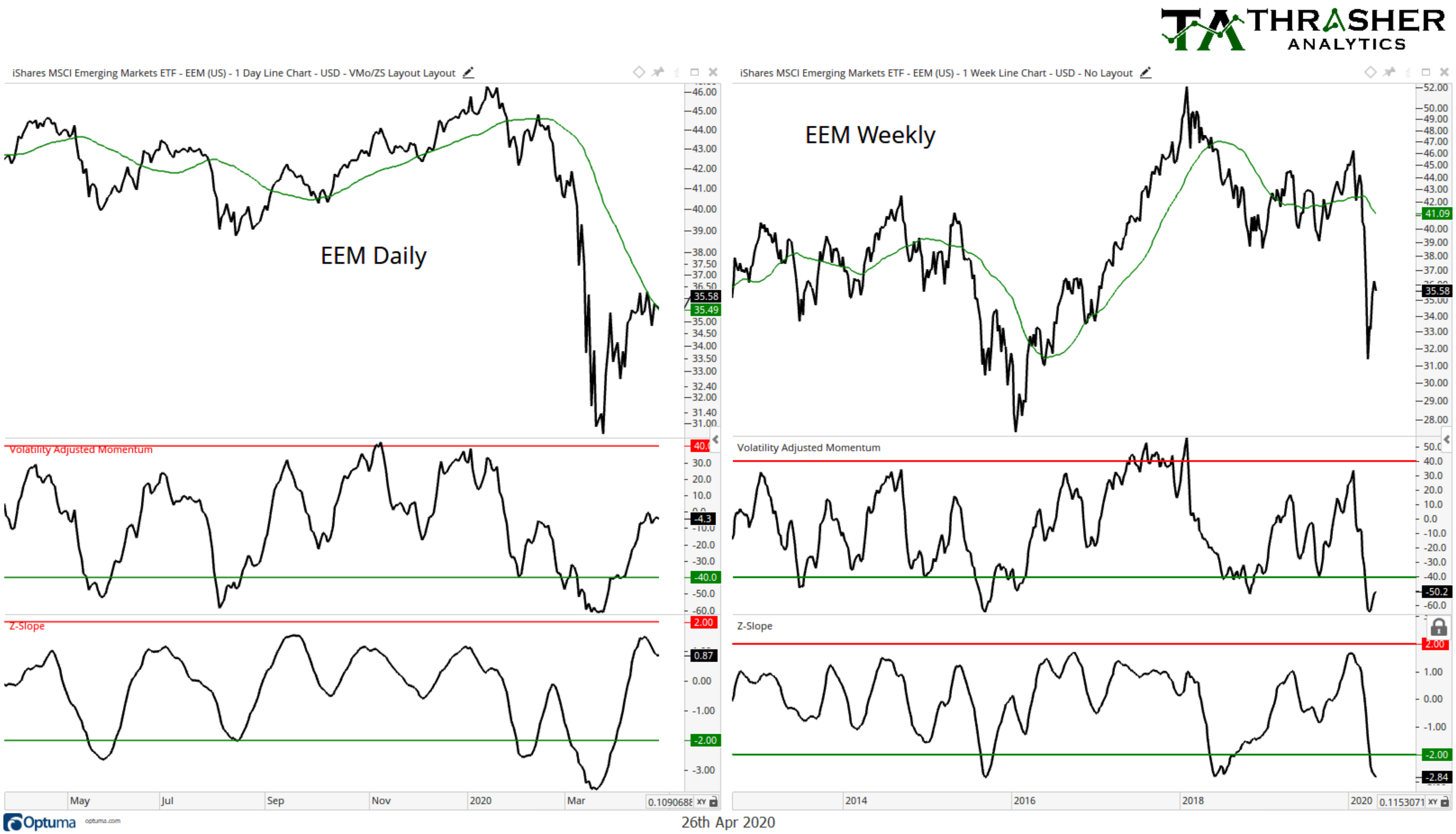


26th Apr 2020

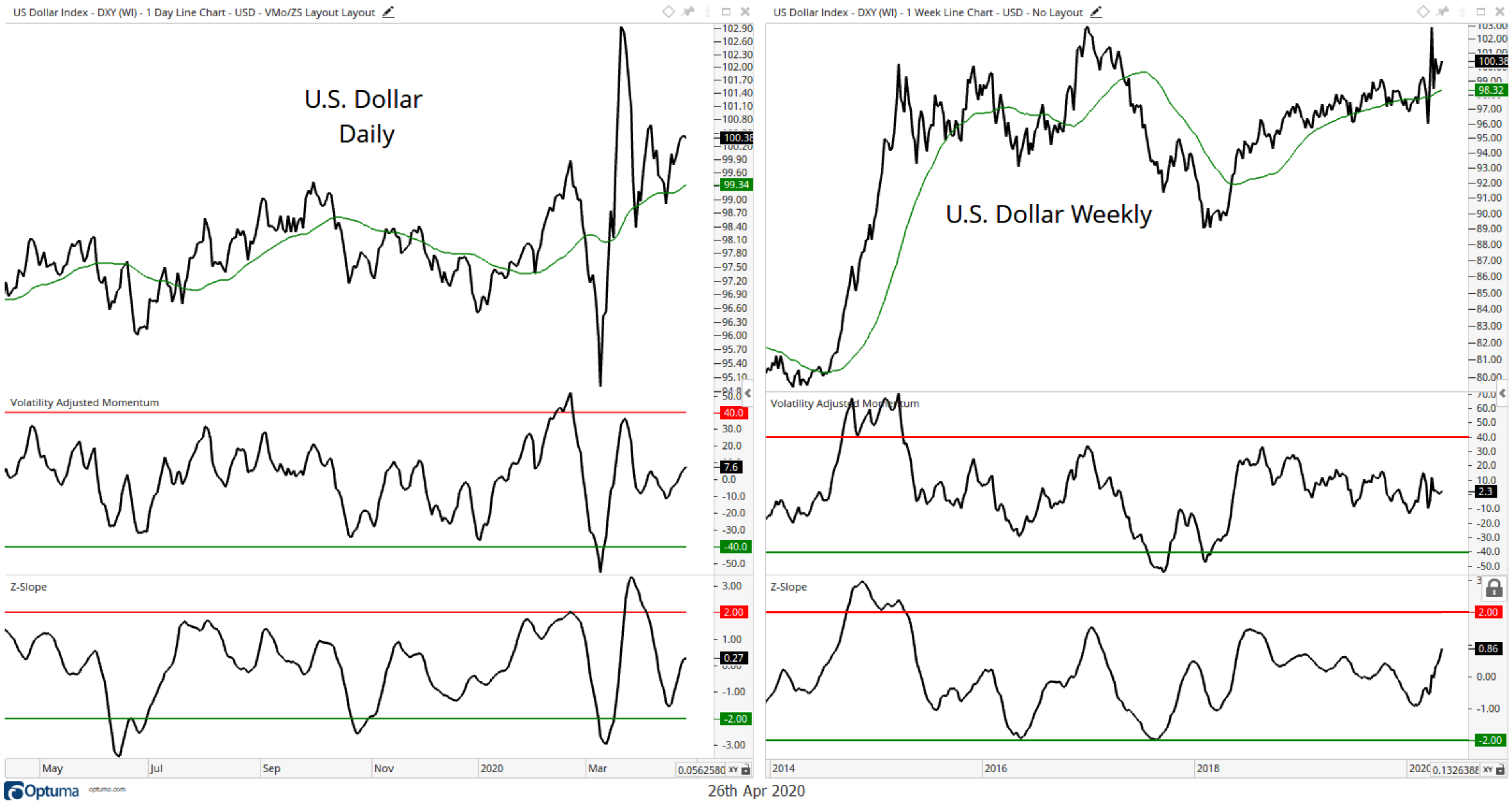


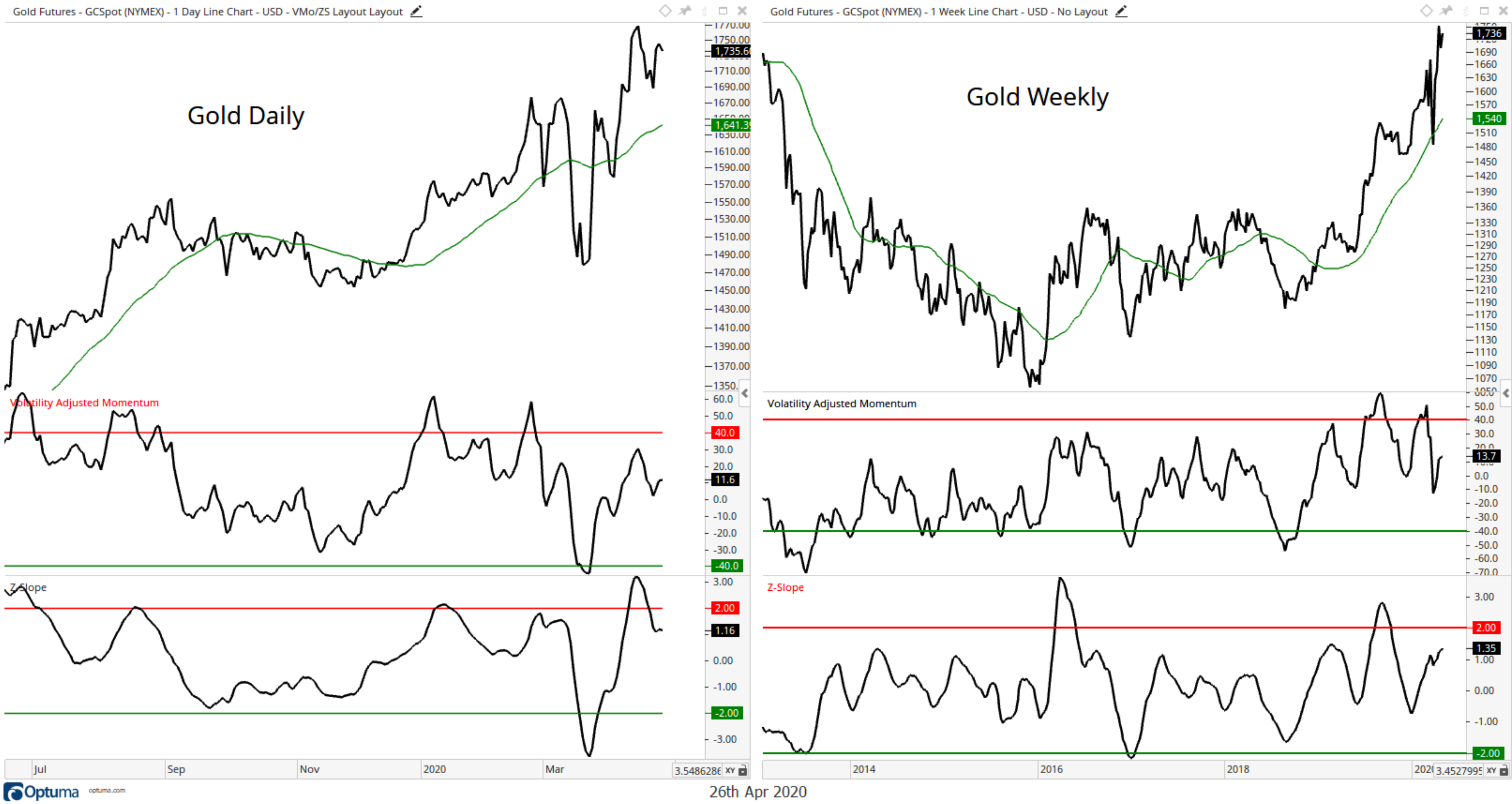
26th Apr 2020


iShares MSCI EAFE Index Fund ETF - EFA (US) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
EFA Daily
Volatility Adjusted Momentum
Z-Slope
May
Jul
Sep
Nov
2020
Mar
iShares MSCI EAFE Index Fund ETF - EFA (US) - 1 Week Line Chart - USD - No Layout
EFA Weekly
Volatility Adjusted Momentum
Z-Slope
2014
2016
2018
Optuma
26th Apr 2020


iShares MSCI Emerging Markets ETF - EEM (US) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
EEM Daily
Volatility Adjusted Momentum
Z-Slope
May
Jul
Sep
Nov
2020
Mar
iShares MSCI Emerging Markets ETF - EEM (US) - 1 Week Line Chart - USD - No Layout
EEM Weekly
Volatility Adjusted Momentum
Z-Slope
2014
2016
2018
2020
Optuma
26th Apr 2020

U.S. DOLLAR


US Dollar Index - DXY (WI) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
U.S. Dollar
Daily
Volatility Adjusted Momentum
Z-Slope
May
Jul
Sep
Nov
2020
Mar
US Dollar Index - DXY (WI) - 1 Week Line Chart - USD - No Layout
U.S. Dollar Weekly
Volatility Adjusted Momentum
Z-Slope
2014
2016
2018
Optuma
26th Apr 2020


Gold Futures - GCSpot (NYMEX) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
Gold Daily
Volatility Adjusted Momentum
Z-Slope
Jul
Sep
Nov
2020
Mar
Gold Futures - GCSpot (NYMEX) - 1 Week Line Chart - USD - No Layout
Gold Weekly
Volatility Adjusted Momentum
Z-Slope
2014
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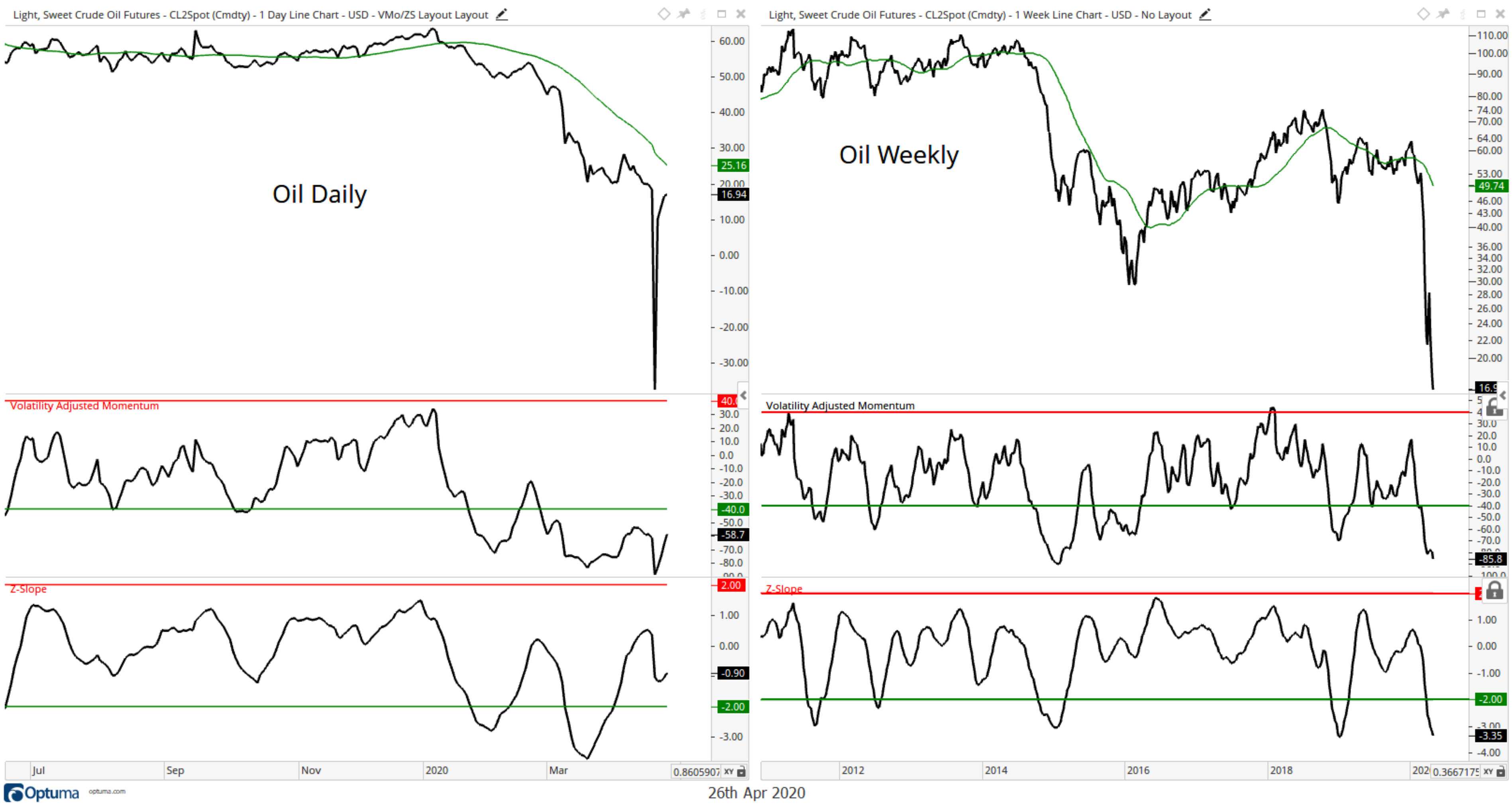
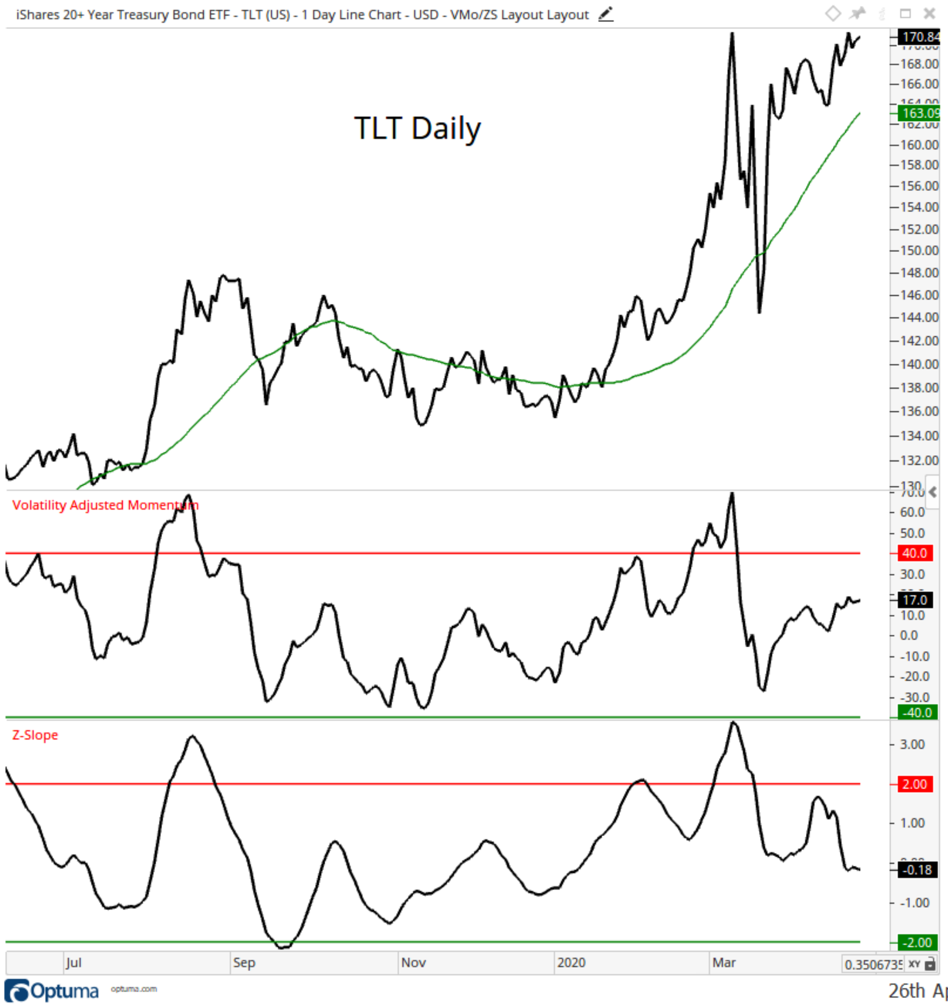
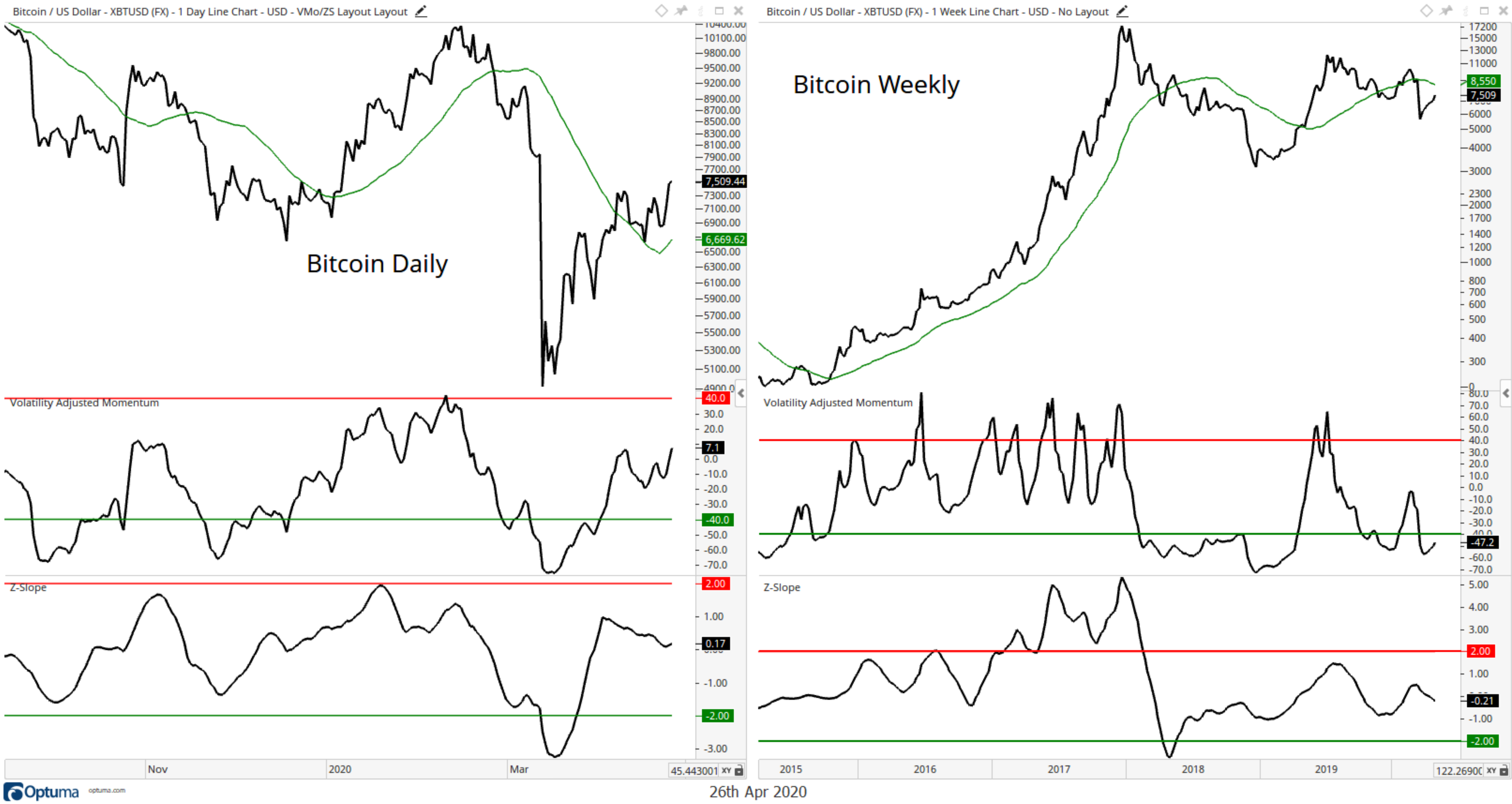
26th Apr 2020


Light, Sweet Crude Oil Futures - CL2Spot (Cmdty) - 1 Day Line Chart - USD - VMo/ZS Layout Layout
Oil Daily
Volatility Adjusted Momentum
Z-Slope
Light, Sweet Crude Oil Futures - CL2Spot (Cmdty) - 1 Week Line Chart - USD - No Layout
Oil Weekly
Volatility Adjusted Momentum
Z-Slope
Optuma
26th Apr 2020



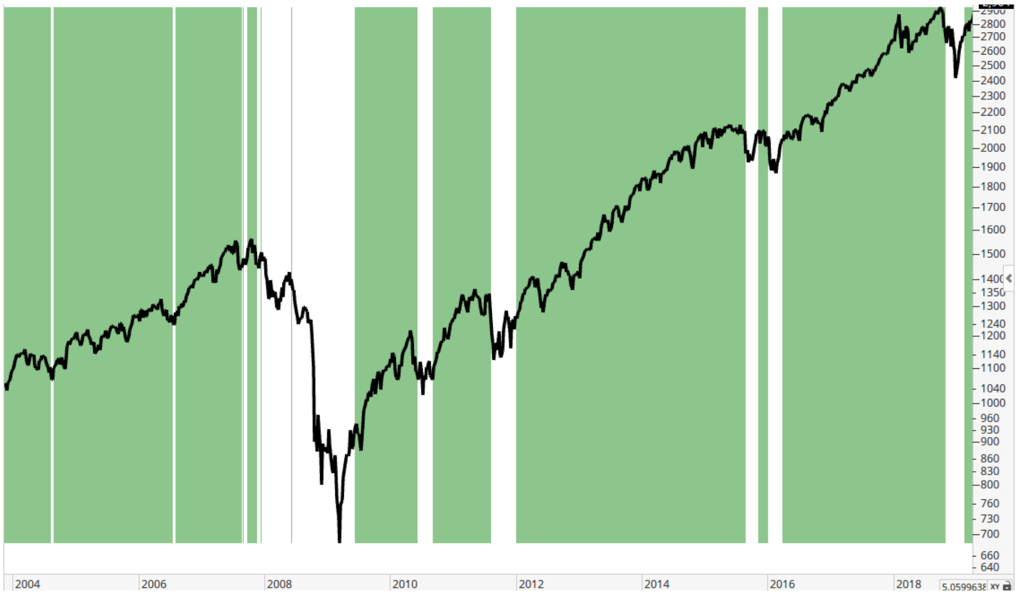
26th Apr 2020

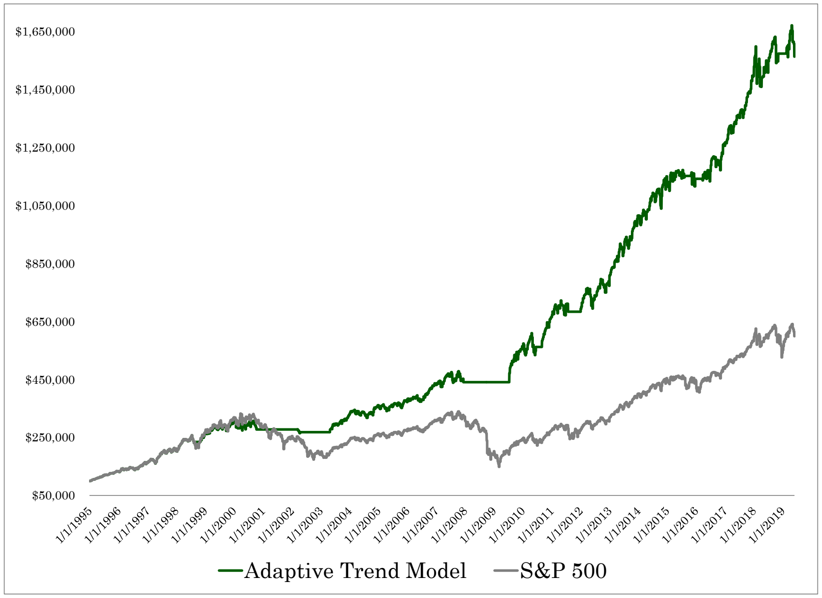


26th Apr 2020

Trend-based analysis is a process built on the idea of enduring minor pullbacks in the anticipating of avoiding protracted drawdowns in financial markets. With a focus on stepping out of the market during large down trends, the Thrasher Analytics Adaptive Trend Model (TAATM) pursues to minimize the "whipsaws" of signals during highly volatile periods of market activity. To accomplish this, TAATM incorporates multiple look-back time periods and incorporates volatility gauges in its evaluation of the equity market's overall trend.

Thrasher Analytics analysis concludes the market's trend is led by the resulting trend of its individual stocks. This means, if the majority of stocks are trending in one direction, then the broad index will be persuaded to follow that trend as well. By incorporating the individual stock trends, volatility, and multiple time periods, the TAATM provides a data-focused look at the overall trend of the U.S. equity market.





	Annualized Return	Annualized Volatility	Beta	Sharpe Ratio	Maximum Drawdown
Adaptive Trend	12.5%	10.3%	0.47	0.97	14.1%
S&P 500	8.9%	15.3%	1	0.42	56.6%

Provided charts, data, and descriptions are a result of a back test using historical market data. No representation is being made that the use of this strategy or any system or data will generate profits. The results do not represent actual results and actual results may significantly differ from the theoretical returns being presented.

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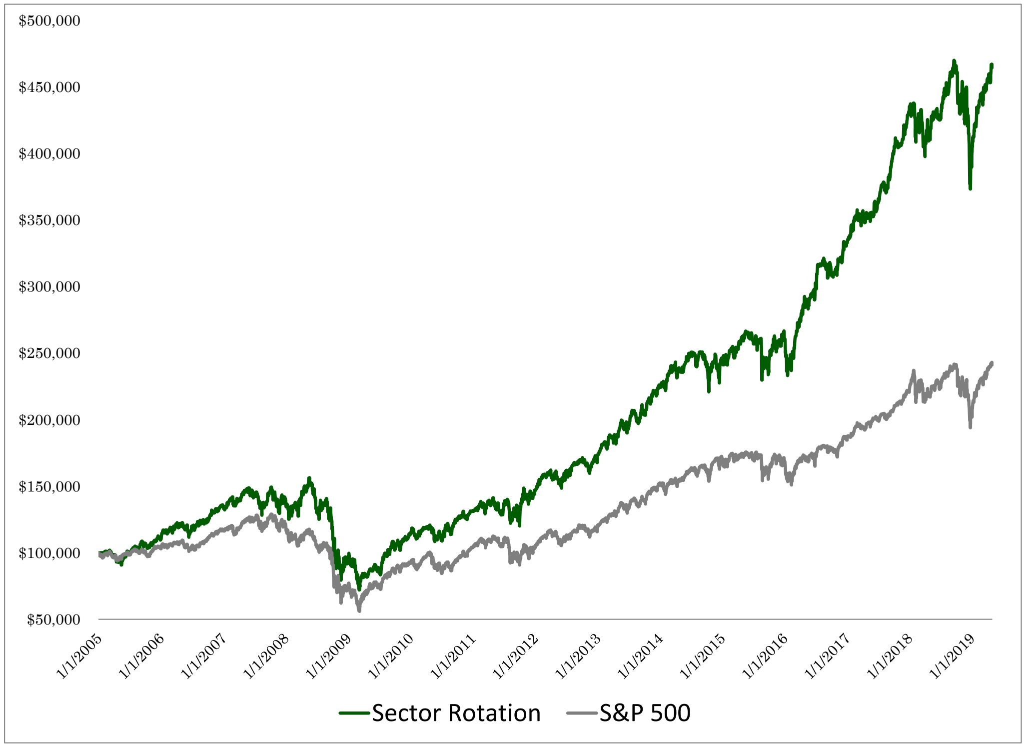
Thrasher Analytics holds the belief, resulted from an in-depth examination of the performance of the primary S&P sectors, that they historically cycle through periods of strength and weakness. In order to move towards capturing the alpha from this rotation, a mean-reversion model is deployed with a monthly rebalance of the lowest scoring sectors. Using proprietary methods of systematic technical analysis, Thrasher Analytics sector rotation model focuses on equity sectors that are most heavily showing signs of volatility and trend exhaustion and likely to be exposed to a positive shift in investor sentiment. By pairing this mean reversion approach towards sectors with the Adaptive Trend Model for the broad index, a layer of risk management can be achieved through strategy diversification.



	Annualized Return	Annualized Volatility	Beta	Sharpe Ratio	Maximum Drawdown
Sector Rotation	12.7%	15.9%	0.96	0.64	53.9%
S&P 500	7.5%	14.8%	1	0.34	56.6%

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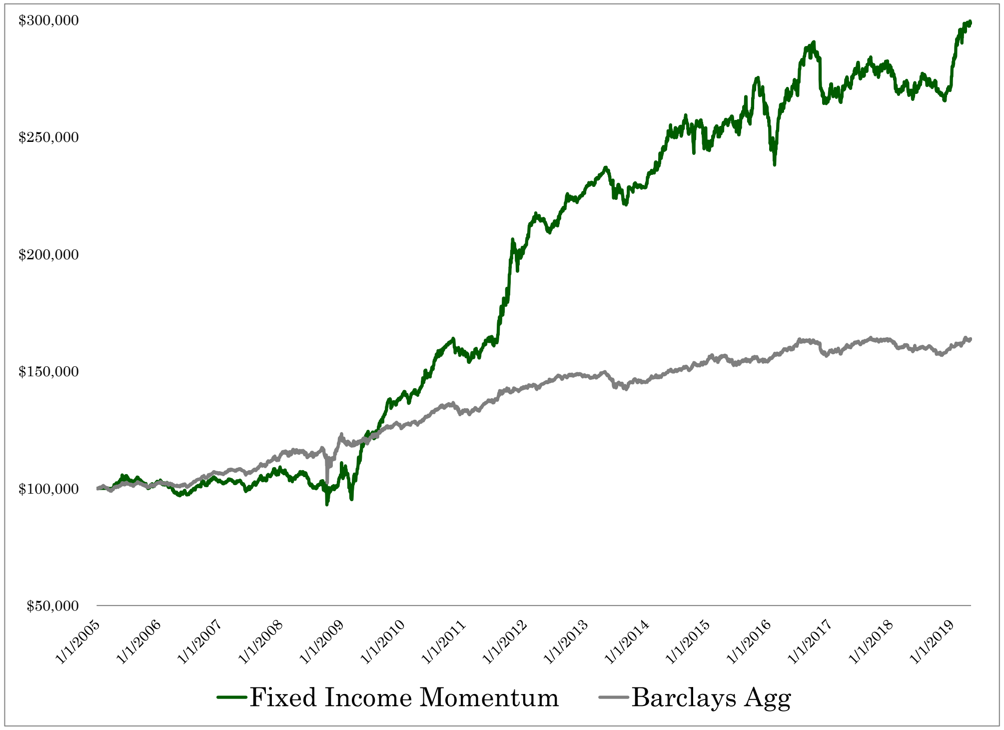
If equities are the speedboats in the sea of financial markets then fixed income securities are the tanker ships. While stocks can move violently in both directions, Thrasher Analytics research has shown that fixed income markets historically show consistent trends. Because of the tanker-like movements displayed by bonds, a quarterly rebalance method is used for the Thrasher Analytics Fixed Income Momentum Model, with a pursuit focusing on the strongest performing corners of the fixed income market. By evaluating the risk adjusted momentum of both long- and short-term momentum, the Fixed Income Momentum Model also incorporates a proprietary indicator that acts as a throttle of the momentum score of each fixed income ETF. This indicator penalizes those ETFs that have moved too high and too fast in short-term trading while still allowing overall positive momentum to be the guiding principle of the model.



	Annualized Return	Annualized Volatility	Beta	Sharpe Ratio	Maximum Drawdown
Fixed Income Momentum	8.3%	8.2%	1.04	0.7	14.9%
Barclays Agg	3.6%	3.7%	1	0.29	11.0%

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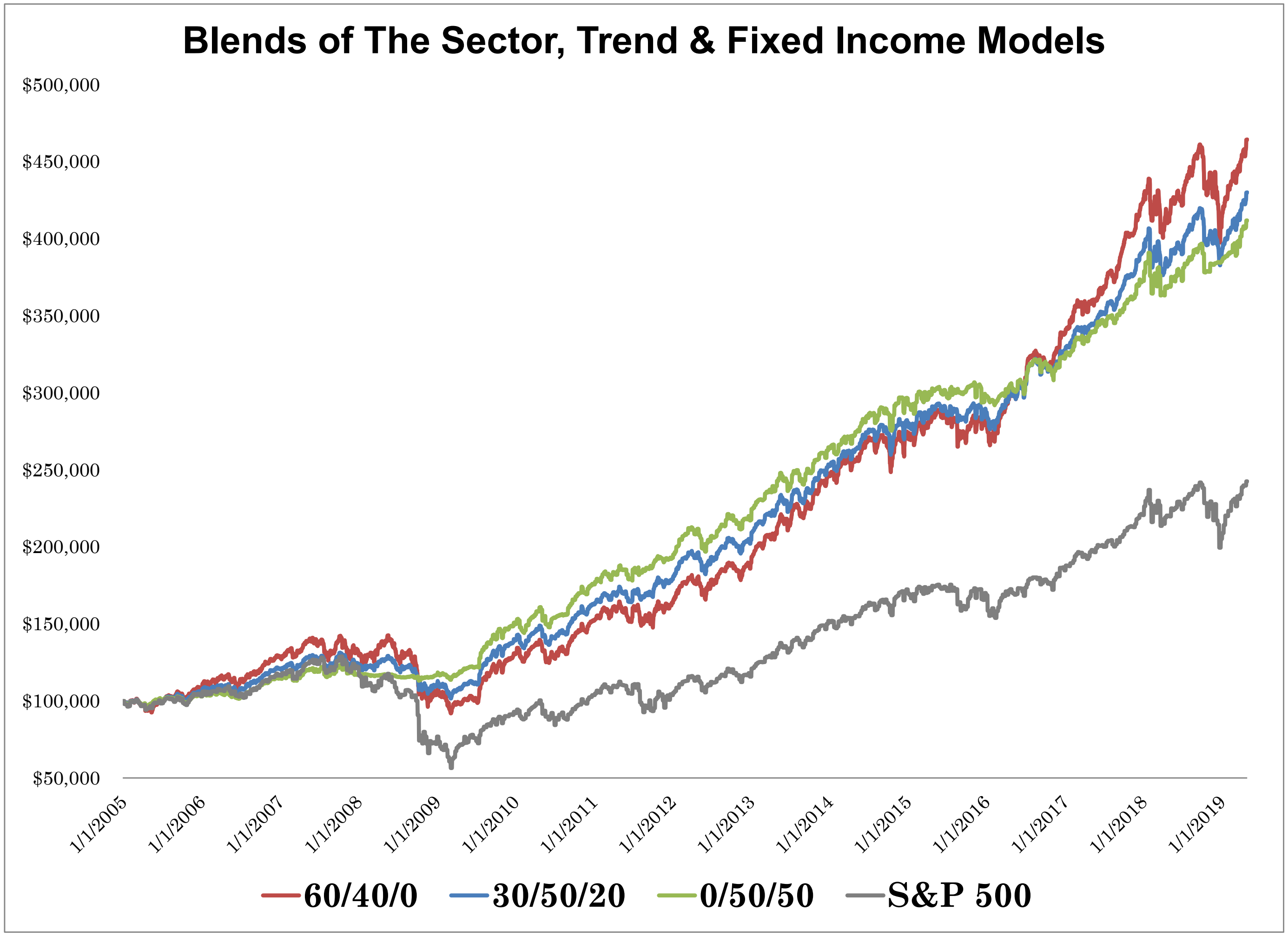
The concept of diversification is not new to financial markets. While many market participants focus on the diversification of the underlying holdings. This procedure is can be vastly skewed during periods of high market turmoil, in which correlations across asset classes tend to historically rise. Thrasher Analytics believes in diversifying in strategy styles. By using multiple investment philosophies, specifically trend following, mean-reversion, and momentum, a blended model is created that has the ability to adapt to changing market environments and volatility. For example, when equity markets show a strong trend preference, the adaptive S&P 500 trend following component benefits but if there's a shift favoring a range-bound market the sector rotation strategy based on mean-reversion should provide favorable performance.



The above chart shows examples of blending the sector, trend, and fixed income models . Ranging from an all equity approach of 60% in sector rotation, 40% trend and 0% in fixed income; 30% in sector rotation, 50% in trend, and 20% in fixed income; 0% in sector rotation, 50% in trend, and 50% in fixed income.

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Trend (weekly)	Sector Rotation (monthly)	Fixed Income Momentum (quarterly)
Negative	XLV	PCY
	XLK	CWB
	XLP	

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Back tested performance is developed with the benefit of hindsight and has inherent limitations. Specifically, back tested results do not reflect actual trading or the effect of material economic and market factors on the decision-making process. Since trades have not actually been executed, results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Further, back testing allows the security selection methodology to be adjusted until past returns are maximized. Actual performance may differ significantly from back tested performance.

The models, results, and data shown assumes that the markets were sufficiently liquid to permit the types of trading used in the model. A $6.95 per trade transaction fee was assumed during the back tested period but the results give no consideration to the effect of taxes of any kind. Because the trades assumed in Thrasher Analytics' presentations have not actually been executed, the results shown may have under- or over-compensated for the impact, if any, of certain market factors such as lack of liquidity or the ability to obtain the execution prices that have been assumed. The models developed and presented by Thrasher Analytics LLC require an historical period of data for parameter estimation prior to the actual commencement of the period shown in the model and in the back tested results. No representation is being made that any account will or is likely to achieve profit or loss similar to those shown in this or any other content produced by Thrasher Analytics LLC.

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