

ThrasherAnalytics.com

BI-WEEKLY RESEARCH & ANALYSIS

Sector Rotation: March	
Technology	XLK
Utilities	XLU
Communications	XLC

Notable Breadth Data:	
SPX >50MA	1.58%
SPX >200MA	5.75%
Nasdaq >50MA	3.88%
Nasdaq >200MA	15.53%

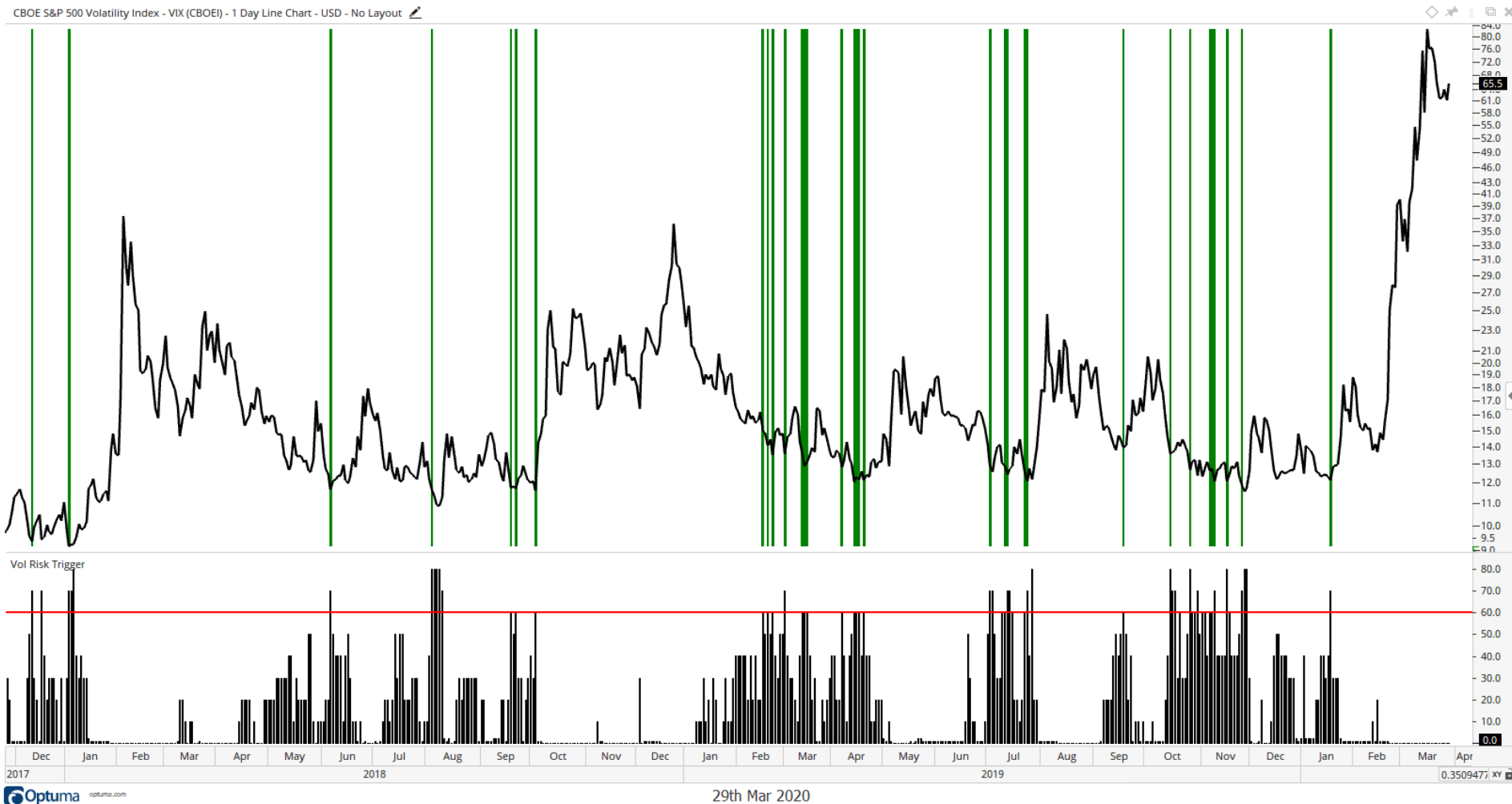
Fixed Income Rotation: Q1	
20+ Treasury	TLT
Aggr Bond	AGG

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	29%	26%
Nasdaq 100	29%	26%
Nikkei	27%	28%
VIX	78%	71%
10yr Treasury	75%	74%
5yr Treasury	74%	73%
CRB Index	15%	21%
Gold	66%	67%
U.S. Dollar	55%	74%

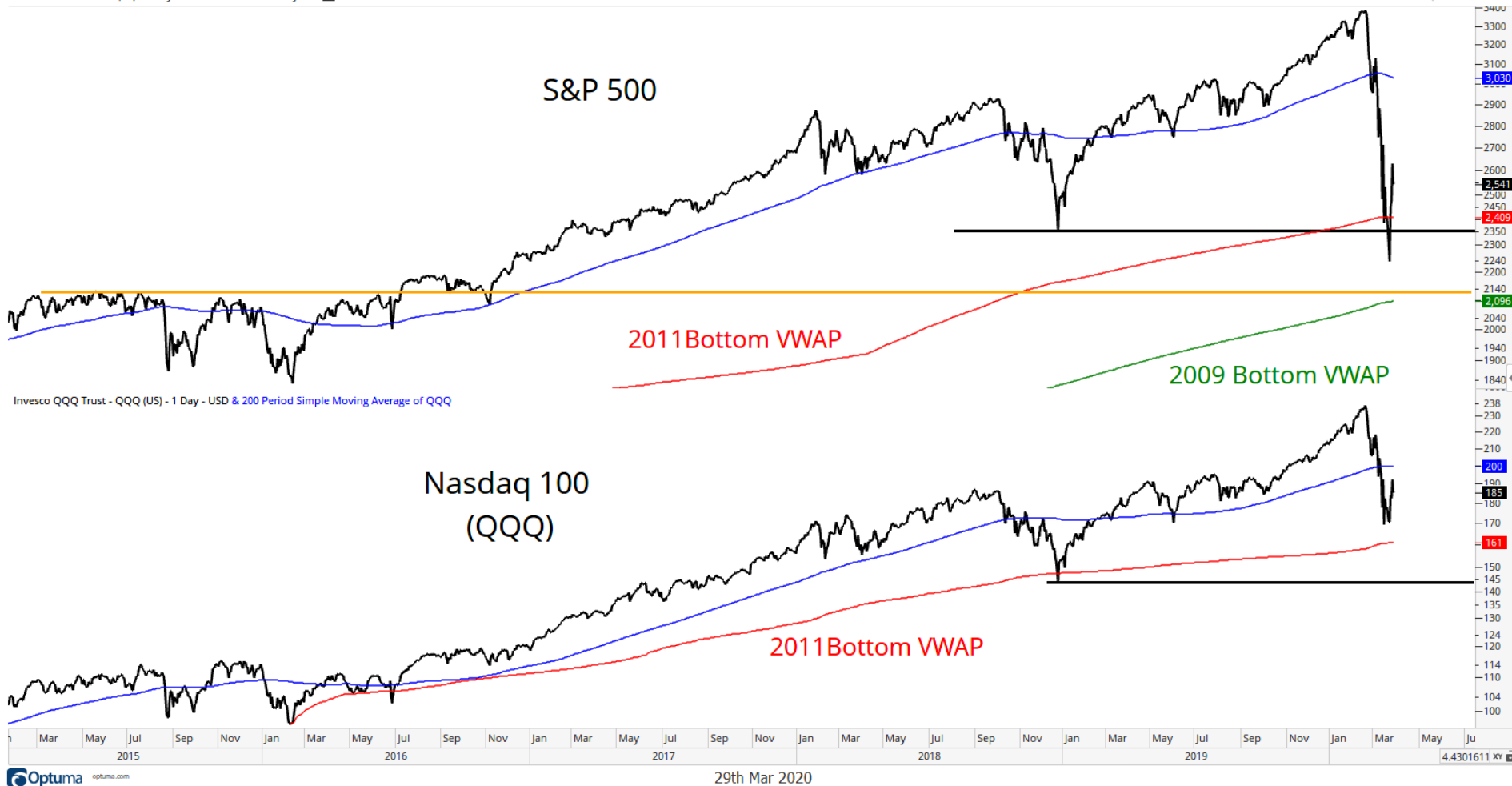
*Green<25% Red>80%

■	Sector	> 50MA	> 200MA	1wk Perf ▼	1mo Perf	3mo Perf	12mo Perf
✓	SPDR Utilities Select Sector Fund ETF	False	False	16.44%	-13.45%	-13.51%	-4.9%
✓	SPDR Real Estate Select Sector Fund ETF	False	False	14.91%	-17.26%	-18.79%	-13.14%
✓	SPDR Industrial Select Sector Fund ETF	False	False	14.57%	-20.89%	-28.1%	-20.08%
✓	SPDR Consumer Discretionary Select Sector Fund ETF	False	False	11.66%	-15.89%	-22.21%	-12.91%
✓	SPDR Financial Select Sector Fund ETF	False	False	11.11%	-23.12%	-31.72%	-17.35%
✓	S & P 500 Stock Index	False	False	10.26%	-14.68%	-21.56%	-9.41%
✓	SPDR Technology Select Sector Fund ETF	False	False	10.04%	-10.39%	-14.49%	7.69%
✓	SPDR Energy Select Sector Fund ETF	False	False	9.55%	-37.48%	-54.07%	-57.06%
✓	SPDR Materials Select Sector Fund ETF	False	False	8.8%	-16.96%	-27.63%	-18.77%
✓	SPDR Health Care Select Sector Fund ETF	False	False	7.46%	-9.41%	-17.44%	-6.02%
✓	SPDR Communication Services Select Sector ETF	False	False	6.32%	-15.51%	-20.95%	-8.59%
✓	SPDR Consumer Staples Select Sector Fund ETF	False	False	6.17%	-9.55%	-15.4%	-3.53%

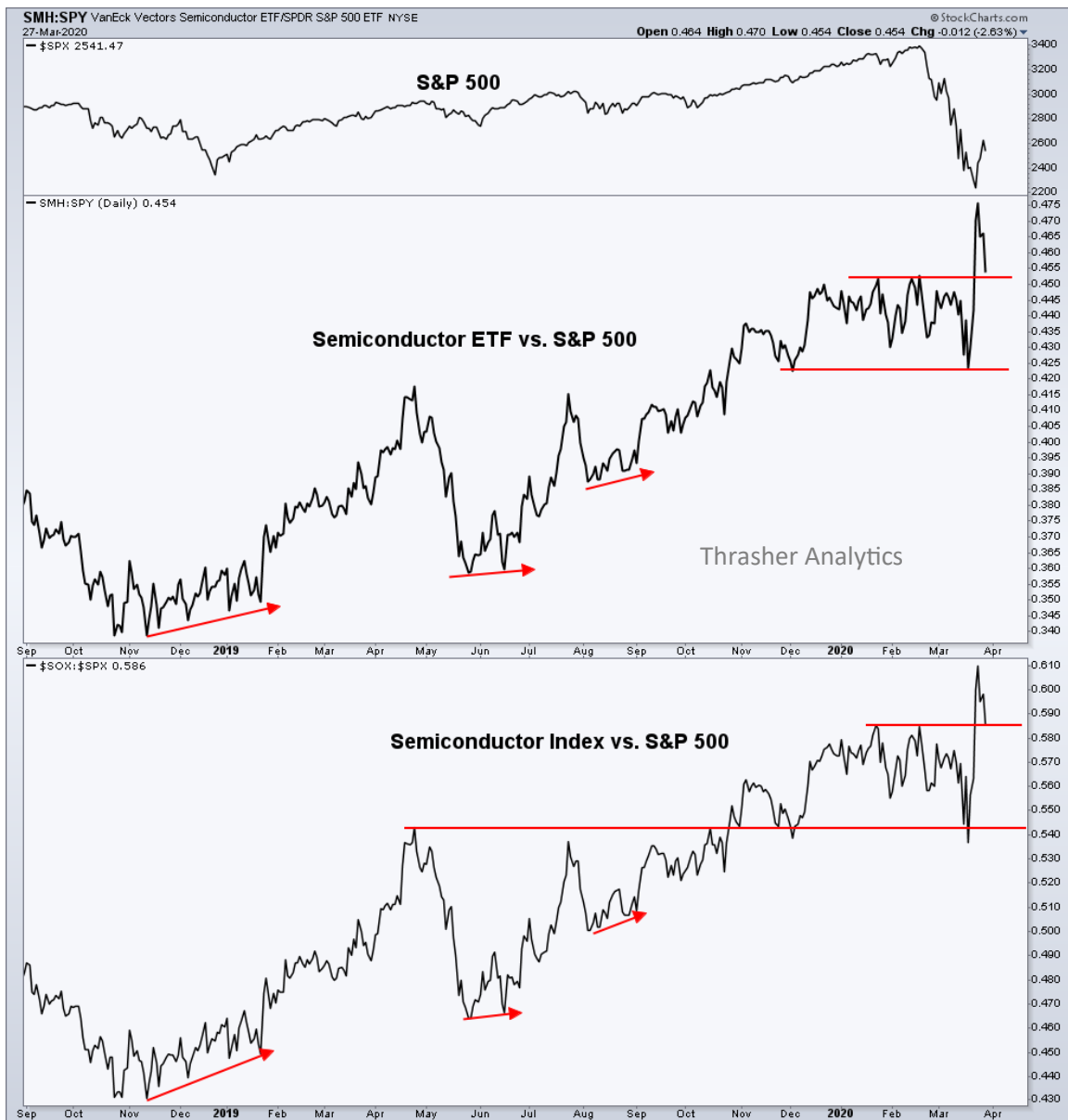


The VIX has begun coming back down after hitting a multi-year high during the current bear market. Spot VIX hasn't been this high since 2008. 20-day realized volatility reached 95 last week, a level surely not reached at least very often in the last hundred years for sure! We are in historic times! 95 is something we can't sustain for very long (surely not) so I'd expect vol to come back in, this doesn't mean equities have to rise but I think there's a stronger case to be made for vol to relax a bit regardless of what SPX does in the short-term. But on the flip side, this market has truly showed us that the unexpected can become reality at the blink of an eye.

S&P 500 INDEX - SPX (WI) - 1 Day Line Chart - USD - No Layout



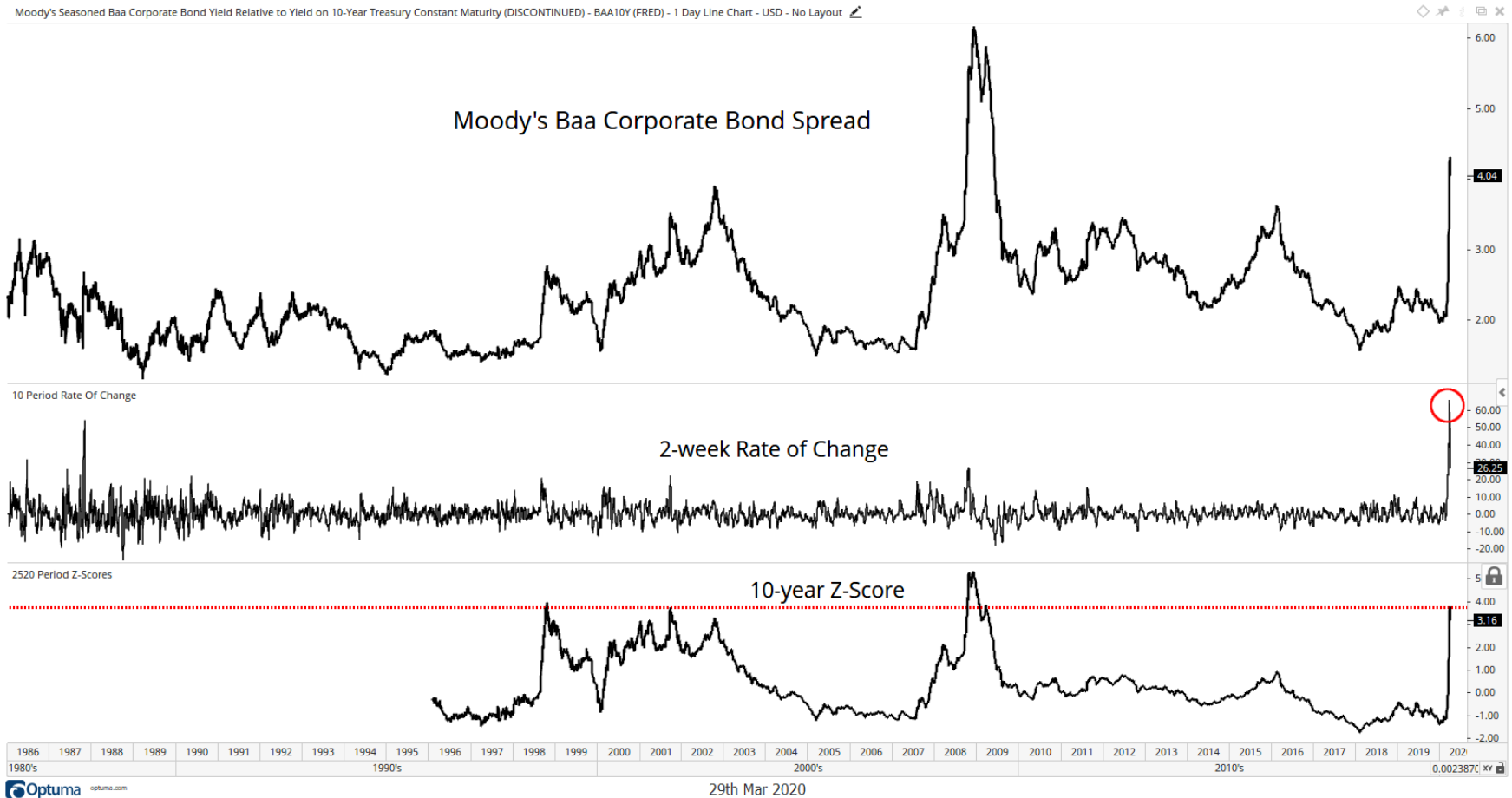
Here's an updated version of the chart I shared last week with the price levels I'm watching for the S&P 500 and Nasdaq 100. Last week, Monday saw a move under the 2011 VWAP but then bounced back above for most of last week. Both the SPX and Nas100 came close to testing their 20-day Moving Average (not shown) before moving lower on Friday. Futures are lower Sunday even, so if we do continue to see weakness, many traders are looking for a test of the Monday low. To that point, remember in Dec. '18 we saw a test of the first low, a bounce, and then further downside into year-end. I share this because just because we get a test, doesn't mean definitively it'll hold as support. We will need to re-evaluate the health of the market at that point. Typical rallies after the first low in a down trend since 1957 have averaged 4.3-20.8%.



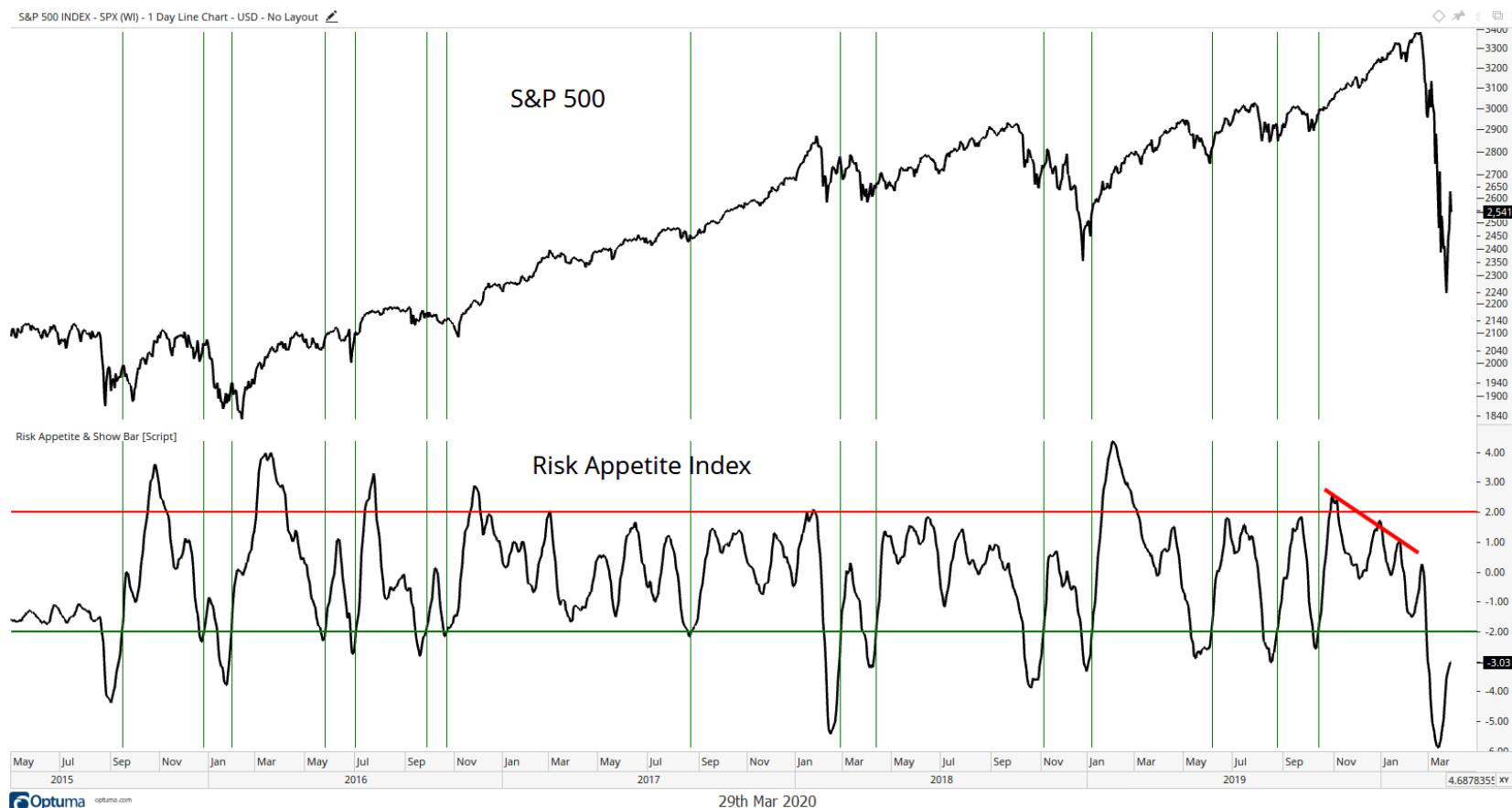
Semiconductors were strong leaders for the last year, showing positive trends in relative strength against the S&P 500. Even during the back-half of the March decline we saw sems hold up well, hitting new relative performance highs as shown on the chart to the left.

At the end of the week the ratios began to decline, as S&P 500 gained ground, moving the ratios to test their breakout points. I'll be watching if this level holds and if semiconductors continue to maintain its leadership role. I think this speaks volumes to the strength in tech and the Nasdaq 100. If we lose semiconductors then that could be a canary for tech as a whole.

The Nasdaq 100 is very stretched in relative performance against the S&P 500, many are looking for that relationship to mean revert and semiconductors may provide an early warning to that shift. I'll continue to monitor the chart.



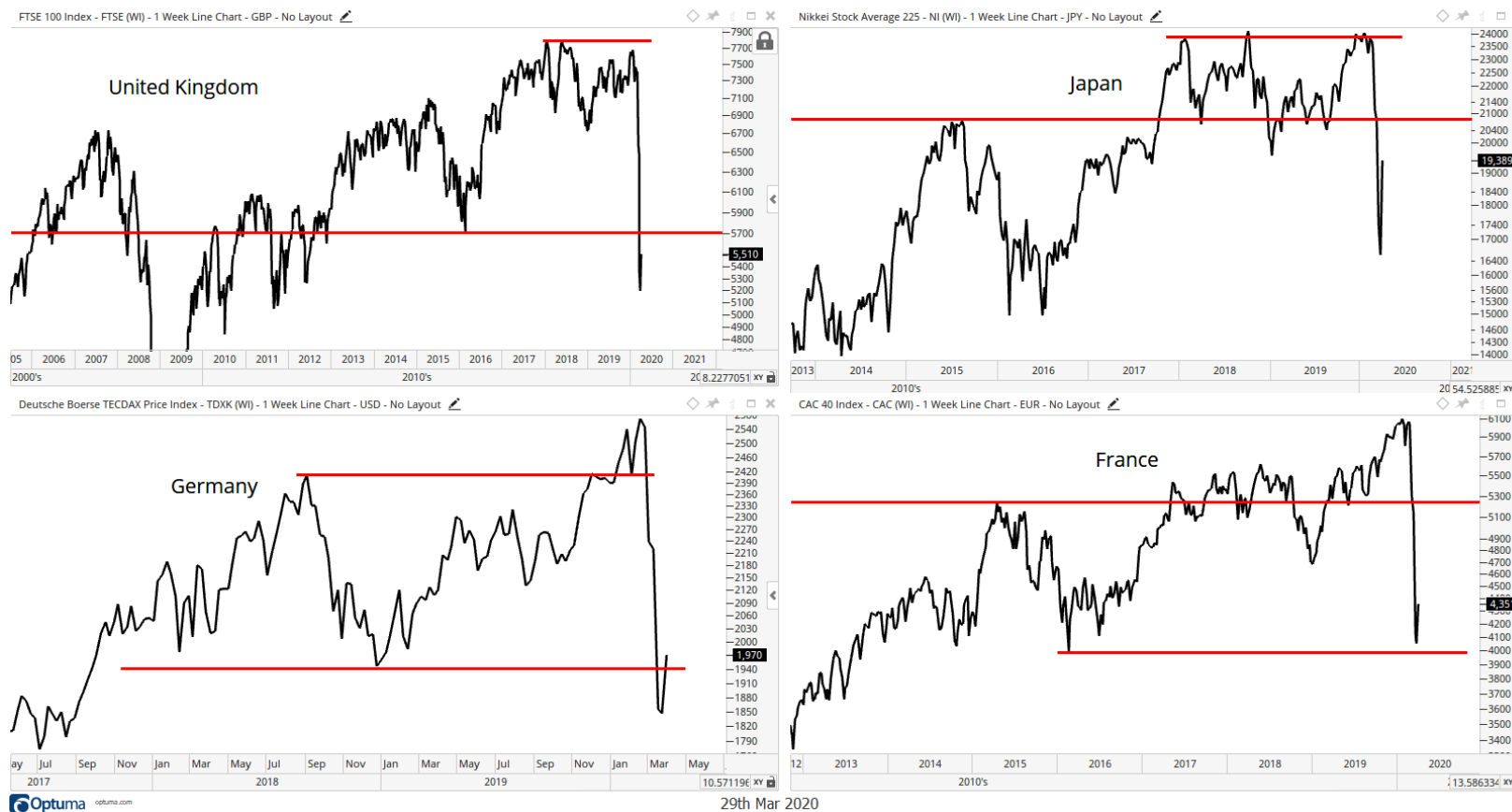
The rise in the corporate bond spread has truly been historic (a word I've used a lot it seems lately to describe market developments!). The 2-week change in the spread is the largest on record for the Moody's index, exceeding the prior high set in 1987. While we haven't reached the high in the spread from the financial crisis, the 10-year Z-score is nearly to a 4 sigma. We last saw sigma level like this in 1998 and 2001. The 1998 move looks similar in to today as it was also a geopolitical event and the 2-week change was abnormally high. We need to see spreads move back down, a sign that confidence is returning to corporate America and more stability in the financial market.



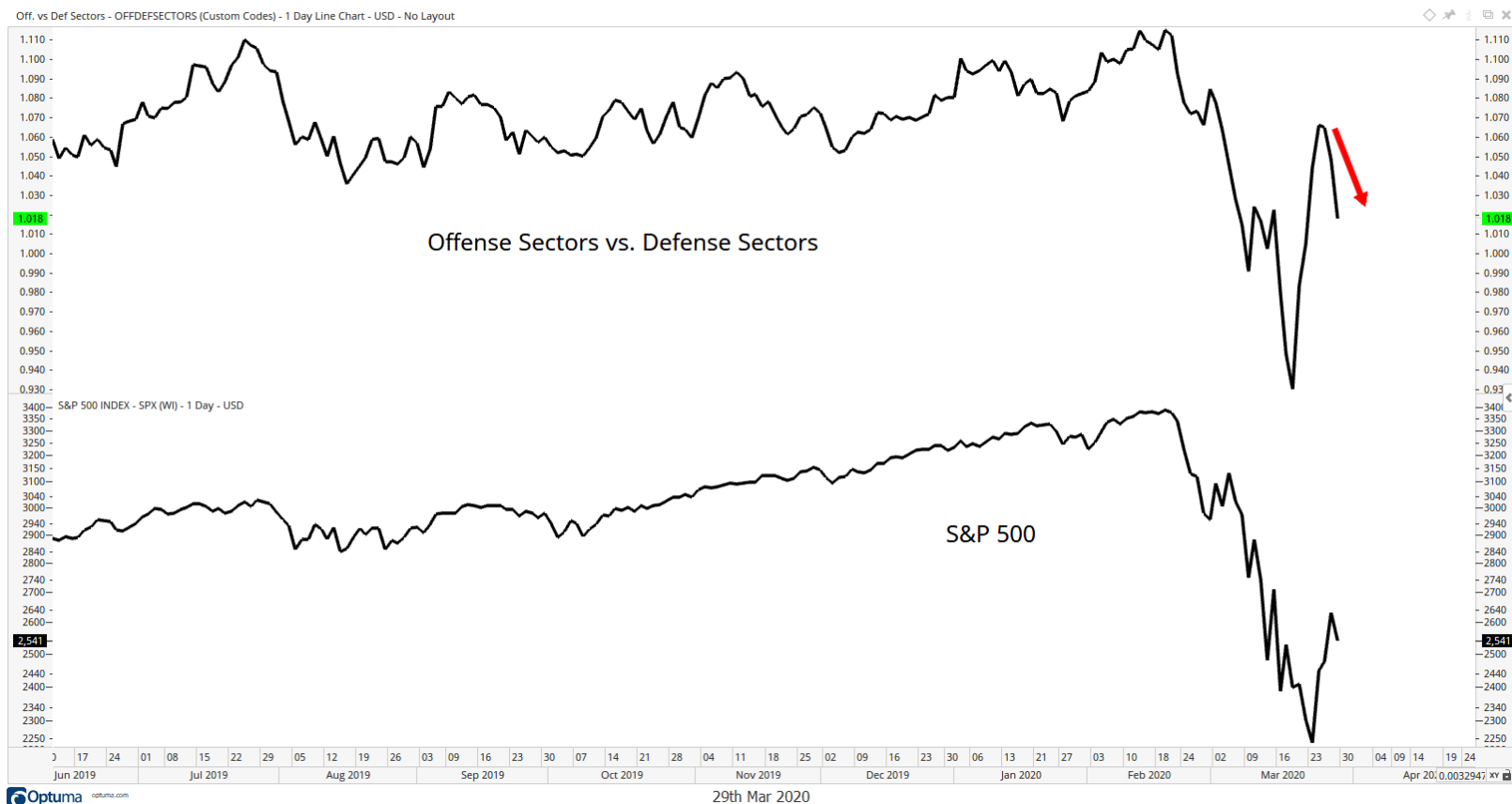
The Risk Appetite Index (RAI) put in a defined bearish divergence with stocks since November of last year and that’s now been confirmed by price with this recent decline. The RAI has now begun to turn higher. I’ve marked green vertical lines when the RAI when its risen back above -2 . This has often been associated—but not always— to stronger equity prices. Note we saw a move above -2 before the second leg down in 2018 and then again at the final low. So while improvements in risk appetite is a positive sign, it needs to be associate with other indicators as well. I find RAI to be more useful at tops than bottoms.



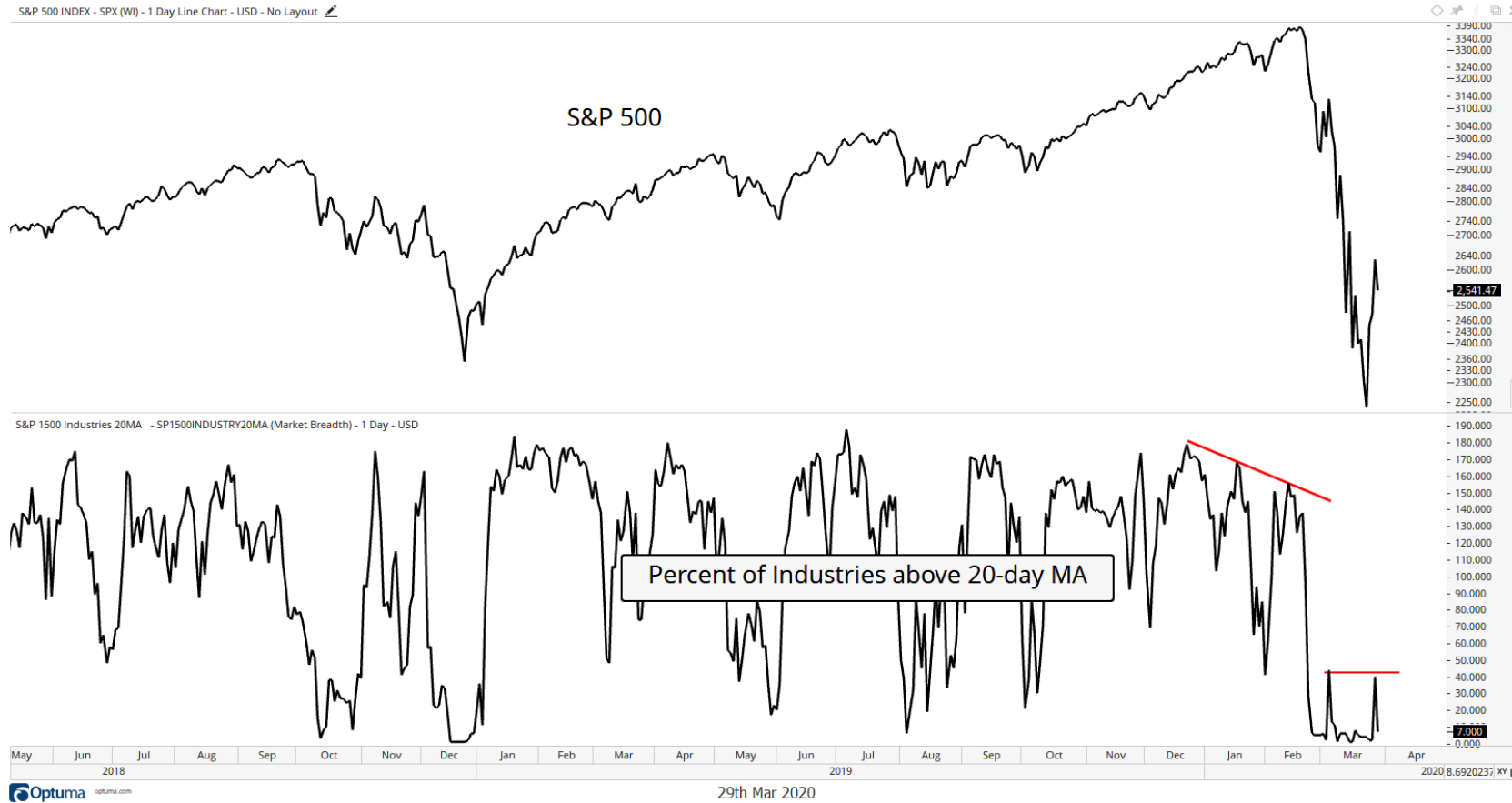
Above is a chart of the S&P 500 and the percentile for the Average True Range of the S&P 100 stocks. What this shows is when at a high level then the average stock is seeing historically high levels of price volatility. We've been near these current levels just a few times - meaning few times have stocks see this much volatility themselves. As I've written in the past about seeing the average volatility for the S&P 500 needing to relax, the same needs to occur with average stocks as well. When the above chart begins to decline, then stocks have been able to move higher. I'll repeat what I've written in the past, we really need less volatility across the board for traders to get comfortable taking on risk exposure in any kind of material size.



Looking at the major international indices, Germany has recovered its 2018 low and France is trying to hold above its 2016 low. These are two markets that were showing leadership going into this down turn, so if they can hold these levels they may become attractive when risk returns to equities. I'm also interested in watching Hong Kong, S. Korea, and China, which may offer value in the near future as well.



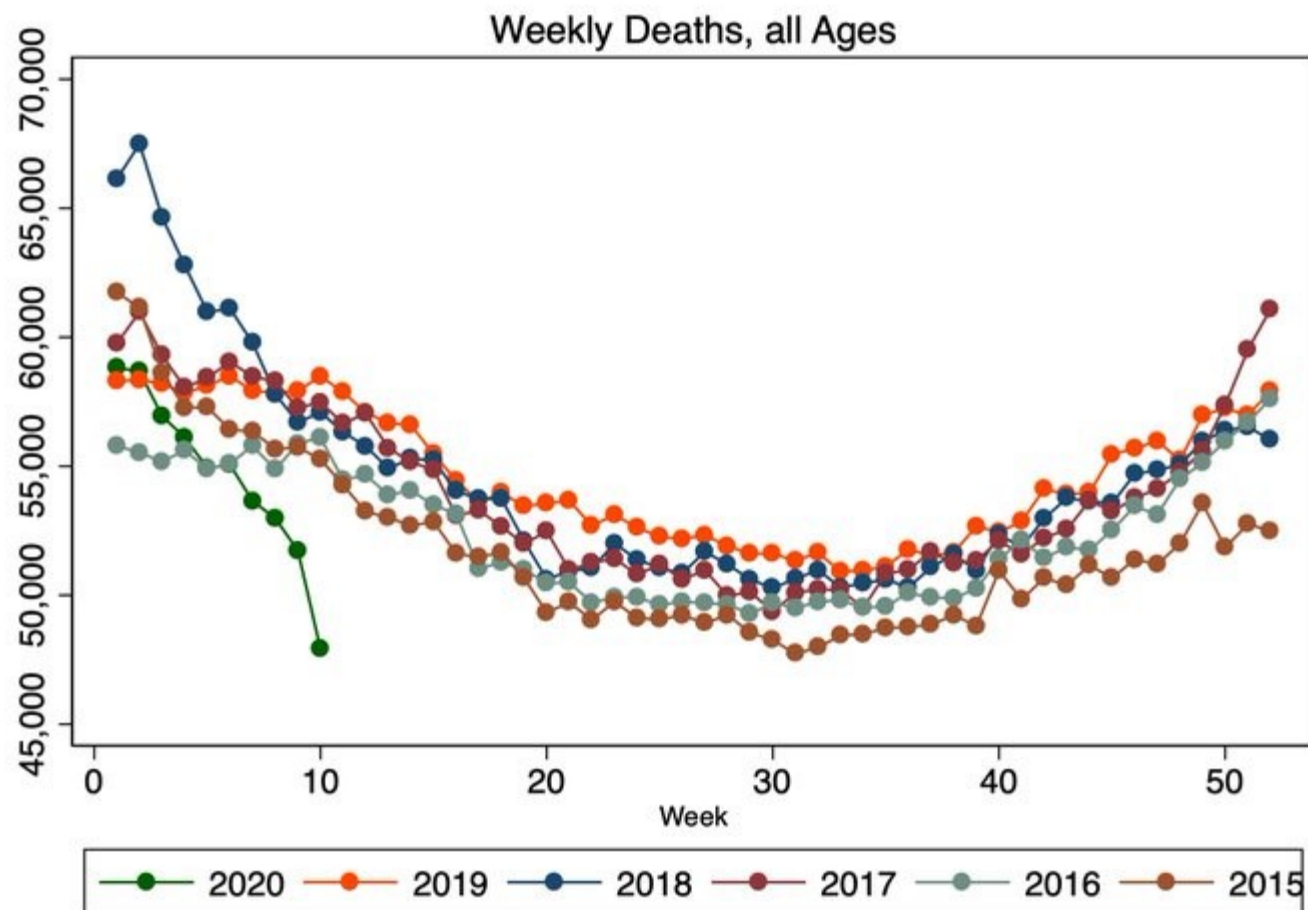
Last Thursday we saw a shift back from offense leadership to defense even with S&P 500 continuing to rise. That shift back to defense also continued on Friday as the ratio shown above began moving lower. When things finally bottom out we'll want to see offensive sectors showing leadership once again.



Above is a breadth indicator that looks at all the industry groups and shows the percent of them that are trading above their 20-day Moving Average. This figure began declining ahead of the March high as fewer equity industries were in short-term up trends. We've now see two small spikes up, but nothing sustainable to hint at underlying strength from a industry perspective. Just like we want to see individual stocks show strength, we also want confirmation in the industries as well. Unfortunately neither is developing at this point—not for stocks or industries.



The above chart comes from Pat Hennessy, head trader at IPS Strategic Capital and shows in the top panel the amount of open interest (OI) for VIX futures. From March 18th through the 23rd, about 150k contracts were liquidated. Pat notes this is why we've seen a brief positive correlation in SPX and VIX as VIX futures were forced lower along with equities during this large drop in OI.



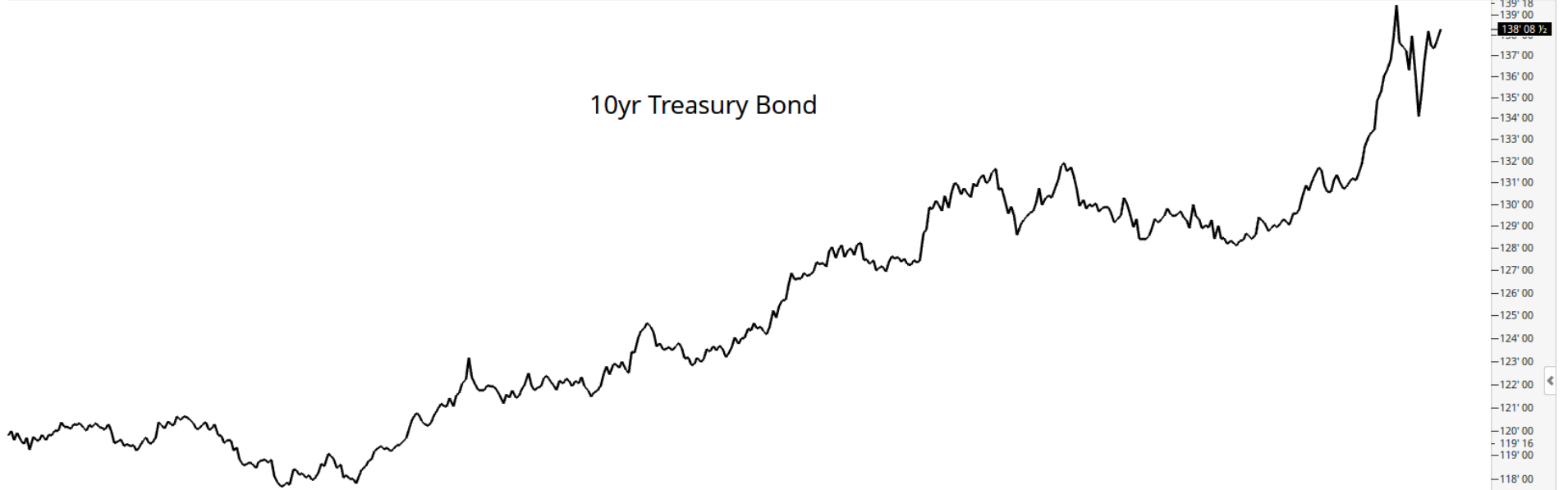
I'll end this section of the letter with one positive note to come from the Coronavirus. This chart from Siddhartha Sanghi shows that total U.S. deaths are well below average YTD compared to the last five years. A positive sign that as more Americans are changing their behaviors and staying in doors we've seen a large drop in the death rate. A small silver lining, but we'll take anything at this point!.

<input type="checkbox"/>	Market	% Bullish [▲]	5MA	History ⁺
<input type="checkbox"/>	Lean Hog DSI	10	22.4	
<input type="checkbox"/>	Lumber DSI	13	17.6	
<input type="checkbox"/>	Crude Oil DSI	13	17.4	
<input type="checkbox"/>	Cotton DSI	13	12.2	
<input type="checkbox"/>	Natural Gas DSI	15	16.6	
<input type="checkbox"/>	Gasoline DSI	15	12.6	
<input type="checkbox"/>	CRB Index DSI	15	21	
<input type="checkbox"/>	Heating Oil DSI	17	16.4	
<input type="checkbox"/>	Cocoa DSI	18	17.8	
<input type="checkbox"/>	Copper DSI	20	18.4	
<input type="checkbox"/>	Corn DSI	23	21.6	
<input type="checkbox"/>	Cattle DSI	24	36.40	
<input type="checkbox"/>	Sugar DSI	25	24	
<input type="checkbox"/>	Silver DSI	25	28.60	
<input type="checkbox"/>	Mexican Peso DSI	25	17.2	
<input type="checkbox"/>	Nikkei DSI	27.00	28.20	
<input type="checkbox"/>	SPX DSI	29.00	25.80	

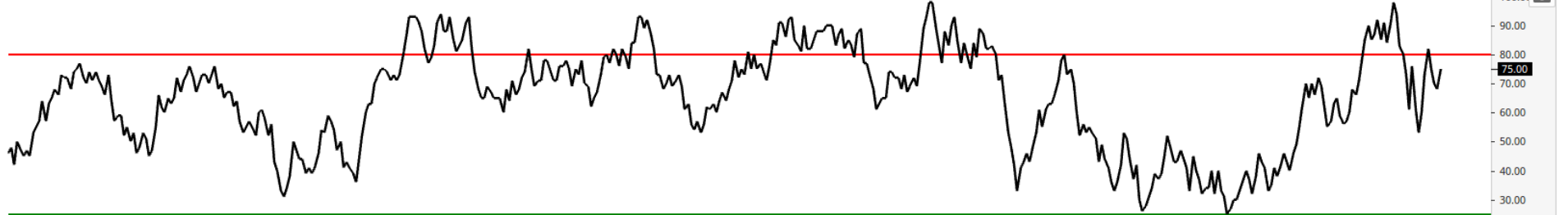
<input type="checkbox"/>	Code	% Bullish [▲]	5MA	History ⁺
<input type="checkbox"/>	Nasdaq DSI	29.00	26.20	
<input type="checkbox"/>	New Zealand Dollar DSI	38.00	25.20	
<input type="checkbox"/>	Platinum DSI	39.00	32.60	
<input type="checkbox"/>	Australian Dollar DSI	41.00	28.40	
<input type="checkbox"/>	British Pound DSI	44.00	25.20	
<input type="checkbox"/>	Orange Juice DSI	52.00	47.80	
<input type="checkbox"/>	Coffee DSI	53.00	55.60	
<input type="checkbox"/>	US Dollar DSI	55.00	74.40	
<input type="checkbox"/>	Swiss Franc DSI	58.00	40.00	
<input type="checkbox"/>	Palladium DSI	58.00	51.60	
<input type="checkbox"/>	Euro DSI	61.00	44.00	
<input type="checkbox"/>	Gold DSI	66.00	67.20	
<input type="checkbox"/>	EuroDollar DSI	73.00	74.60	
<input type="checkbox"/>	5YR DSI	74.00	73.40	
<input type="checkbox"/>	10Y DSI	75.00	74.00	
<input type="checkbox"/>	Wheat DSI	77.00	75.40	
<input type="checkbox"/>	VIX DSI	78.00	71.00	

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

10 Year U.S. Treasury Notes - TYSpot (CBOT) - 1 Day Line Chart - USD - No Layout



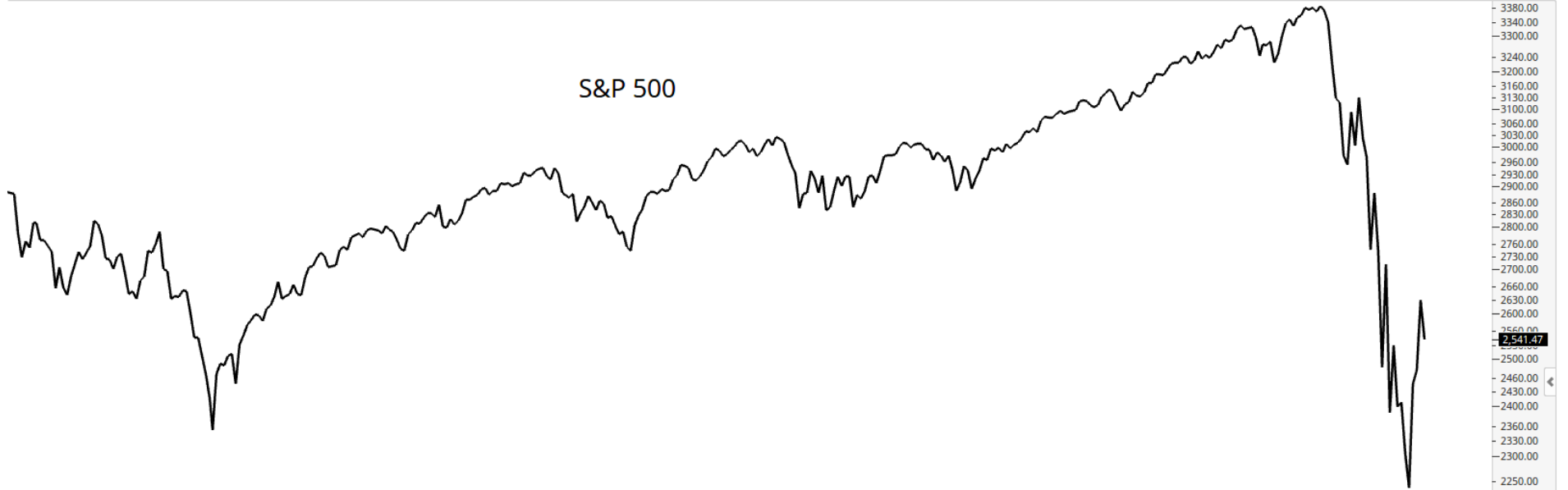
10Y DSI (DSI) - 1 Day - USD



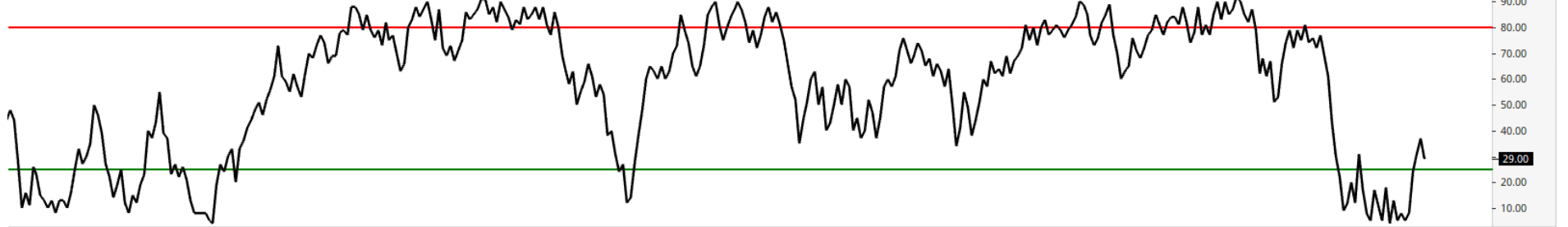
Jun 2018 Jul 2018 Aug 2018 Sep 2018 Oct 2018 Nov 2018 Dec 2018 Jan 2019 Feb 2019 Mar 2019 Apr 2019 May 2019 Jun 2019 Jul 2019 Aug 2019 Sep 2019 Oct 2019 Nov 2019 Dec 2019 Jan 2020 Feb 2020 Mar 2020 Apr 2020



S&P 500 INDEX - SPX (WI) - 1 Day Line Chart - USD - No Layout



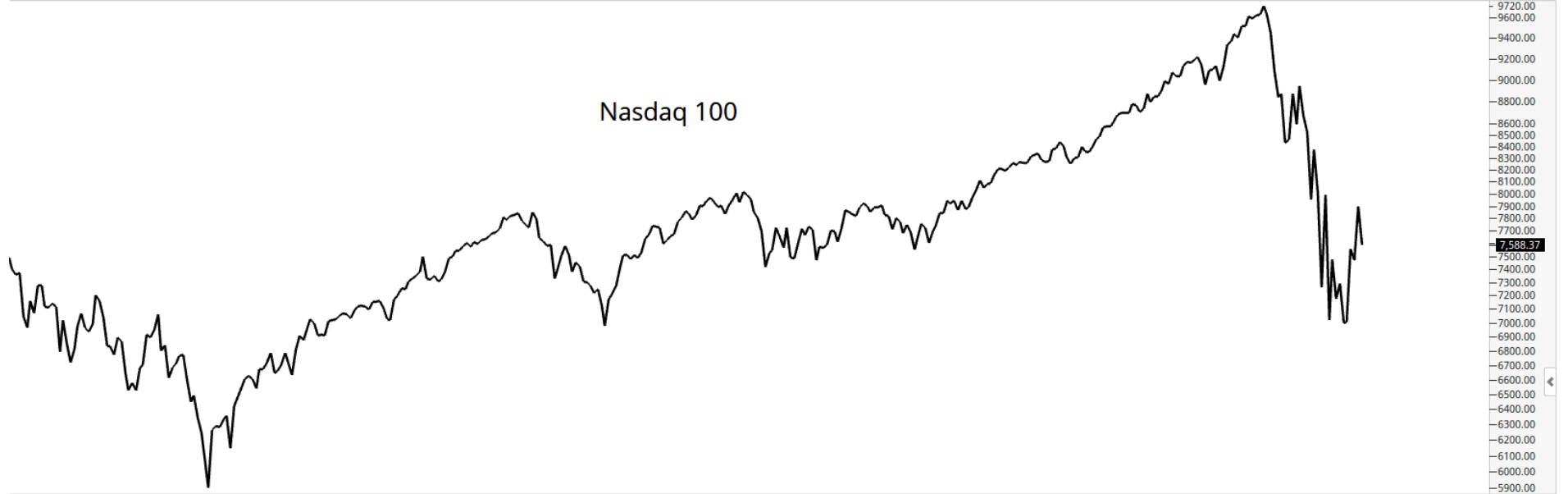
SPX DSI (DSI) - 1 Day - USD



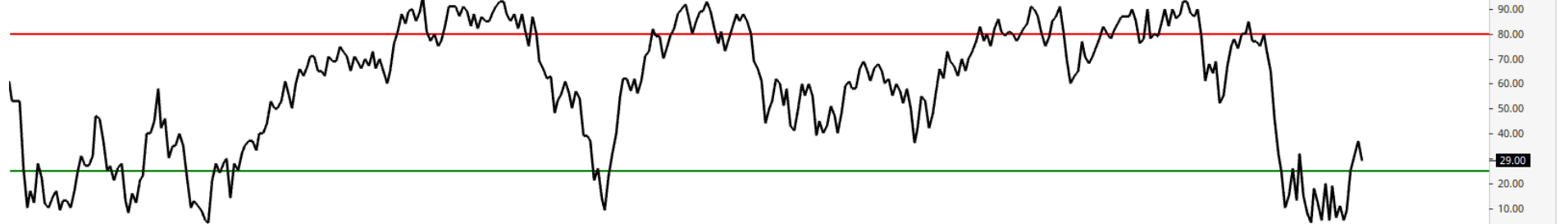
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2018								2019										2020



NASDAQ 100 Index - NDY (WI) - 1 Day Line Chart - USD - No Layout

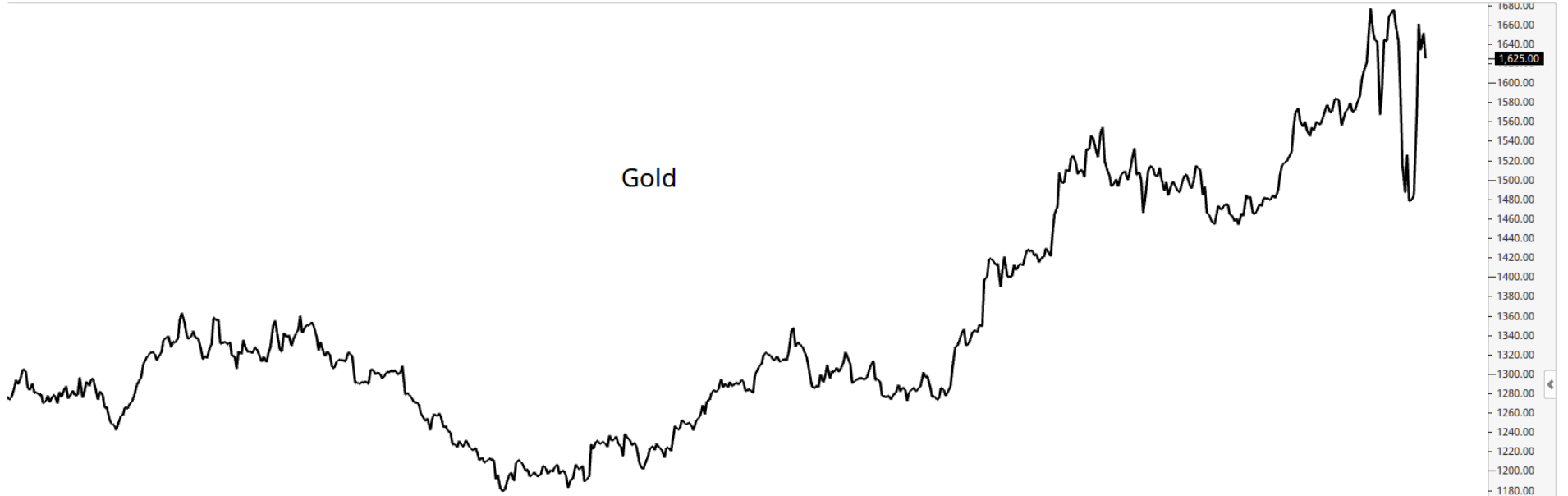


Nasdaq DSI (DSI) - 1 Day - USD

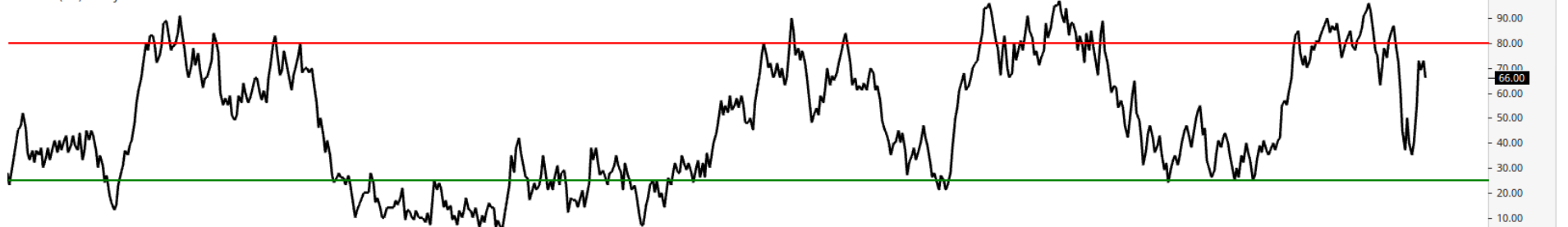


Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
2018								2019												2020

Gold Futures - GCSpot (NYMEX) - 1 Day Line Chart - USD - No Layout

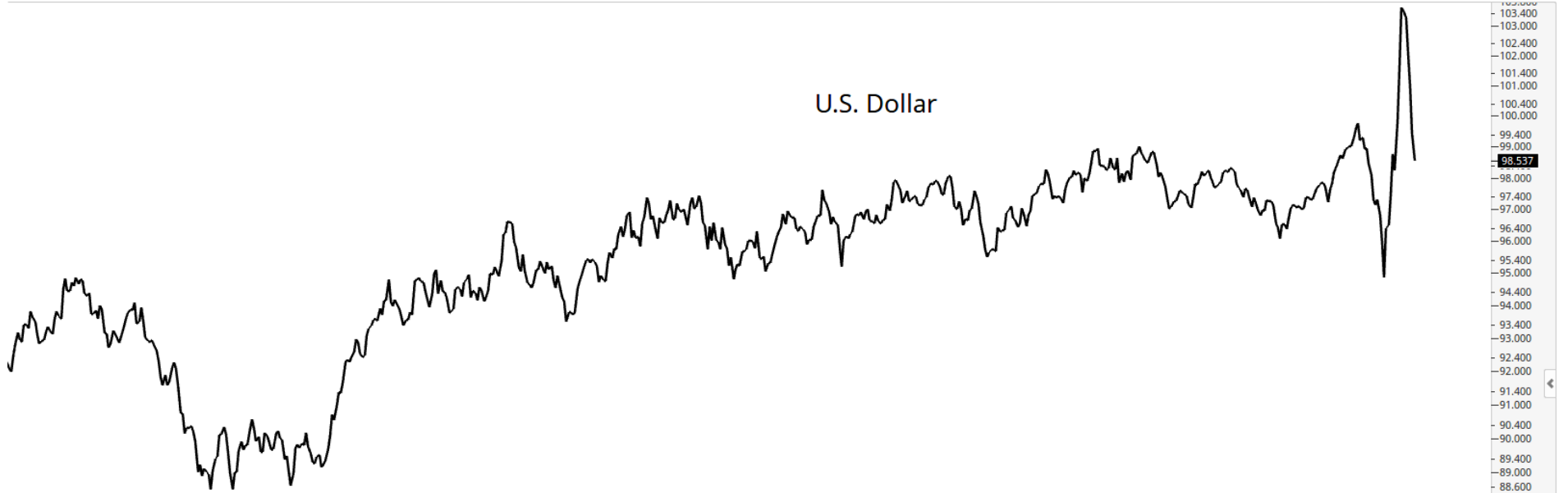


Gold DSI (DSI) - 1 Day - USD

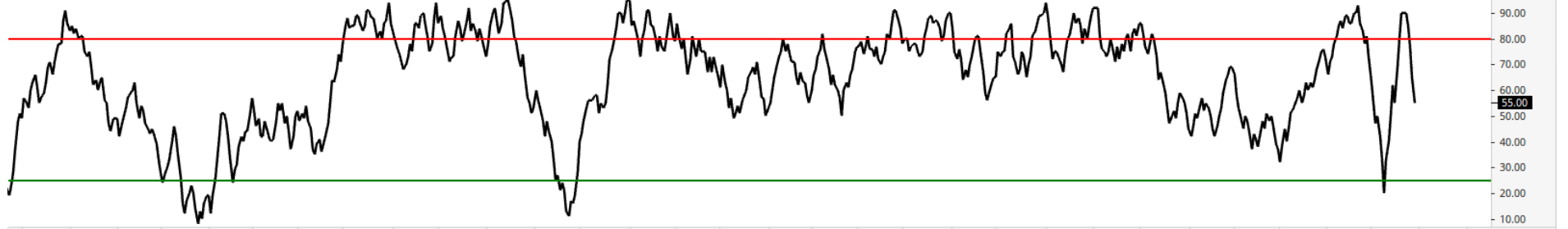


Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2017 2018 2019 2020 29th Mar 2020

U.S. Dollar Index - DXSpot (AFUT) - 1 Day Line Chart - USD - No Layout



US Dollar DSI (DSI) - 1 Day - USD



2017 Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr Mi
2018 2019 20 0.0679947, xy

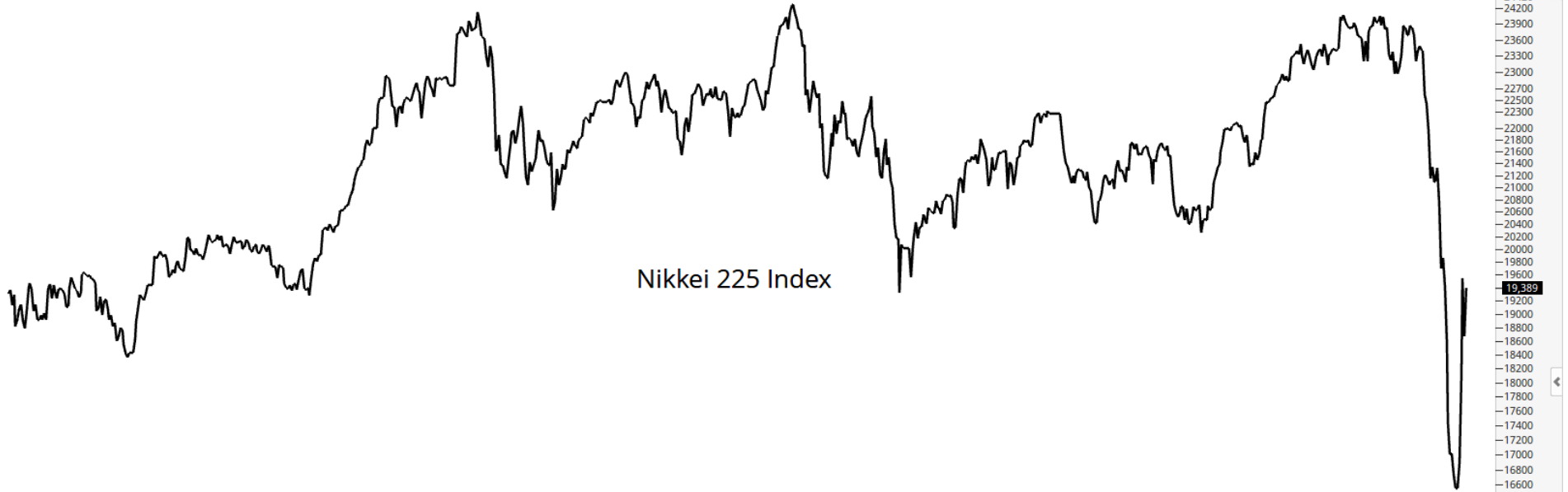
CBOE S&P 500 Volatility Index - VIX (CBOE) - 1 Day Line Chart - USD - No Layout

Chart controls: zoom, pan, refresh, close

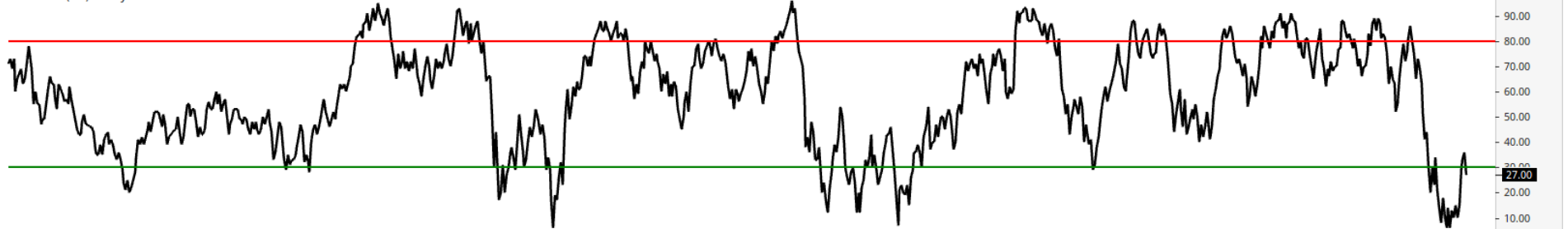




NIKKEI 225 INDEX - NYCash (CME) - 1 Day Line Chart - USD - No Layout

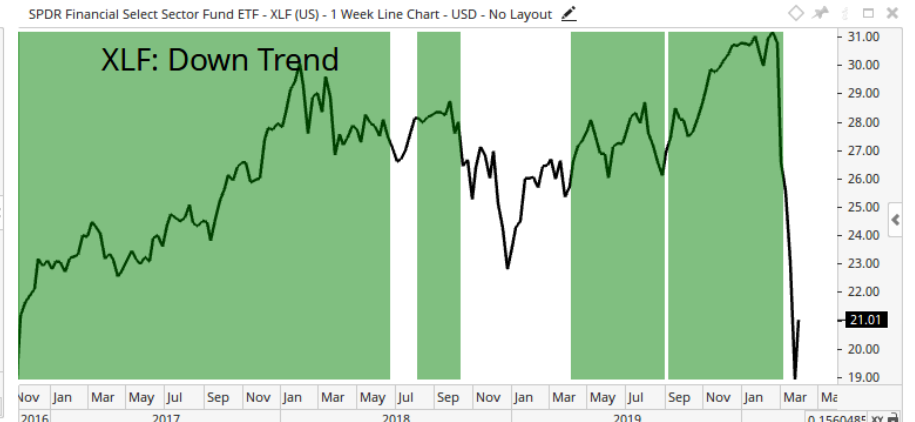
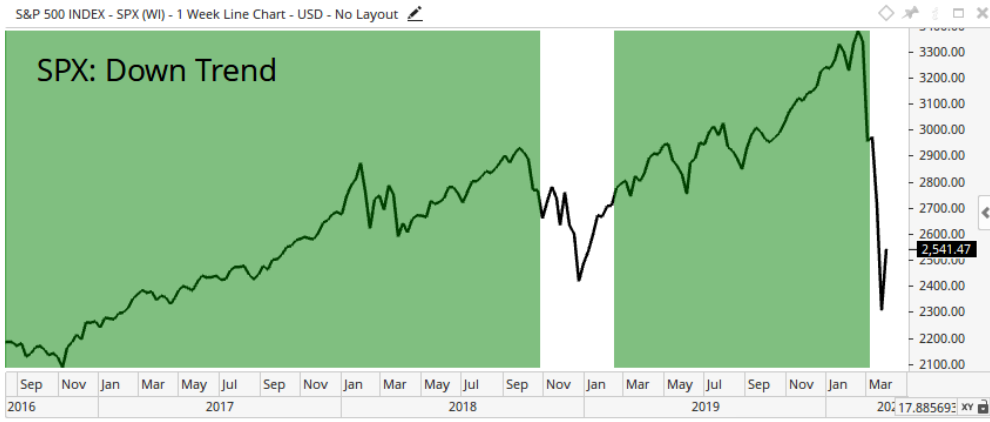


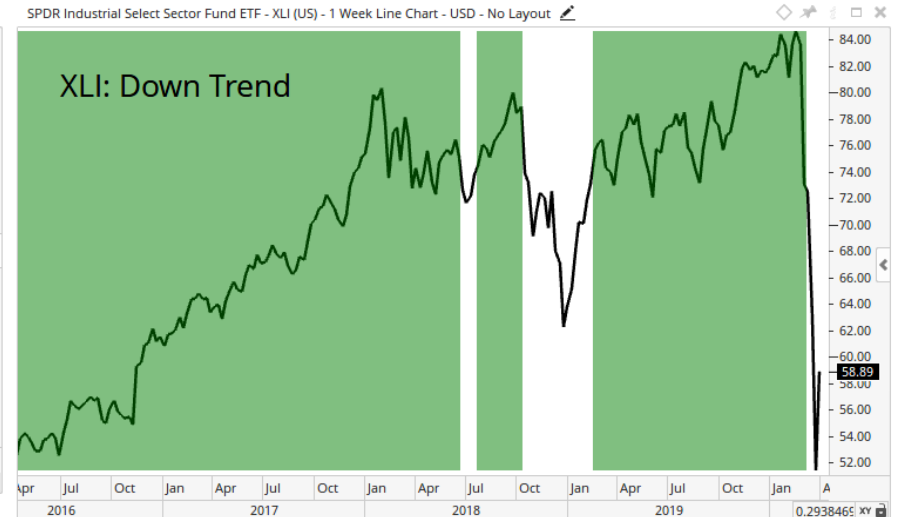
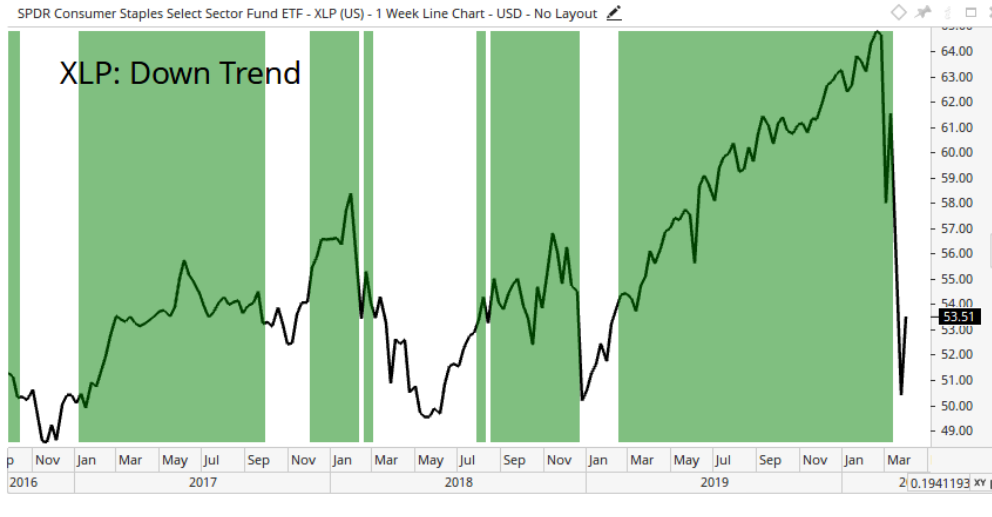
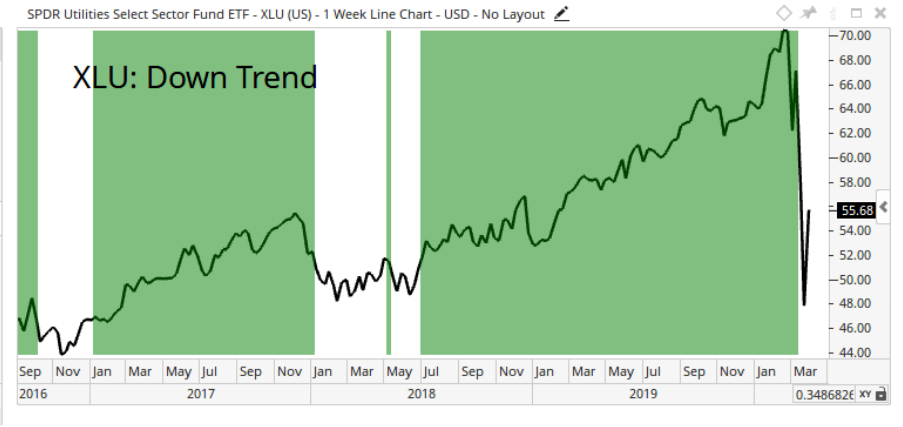
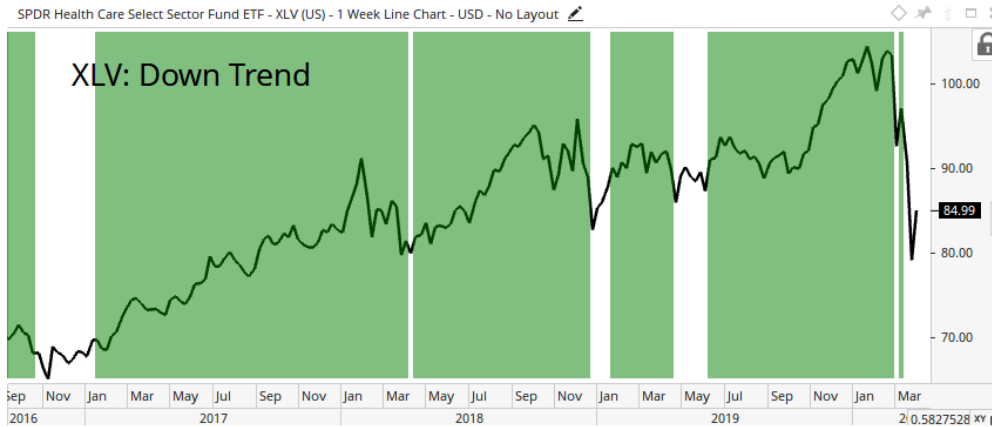
Nikkei DSI (DSI) - 1 Day - USD

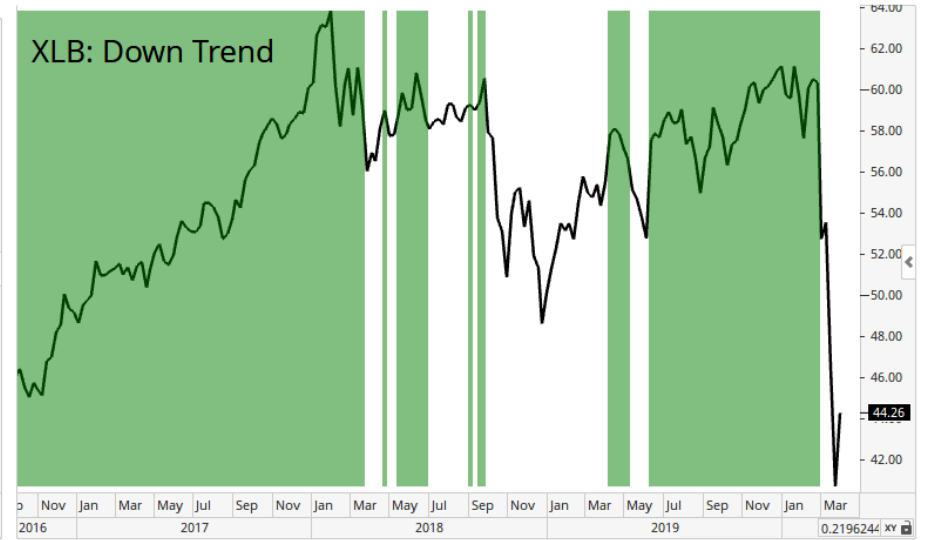
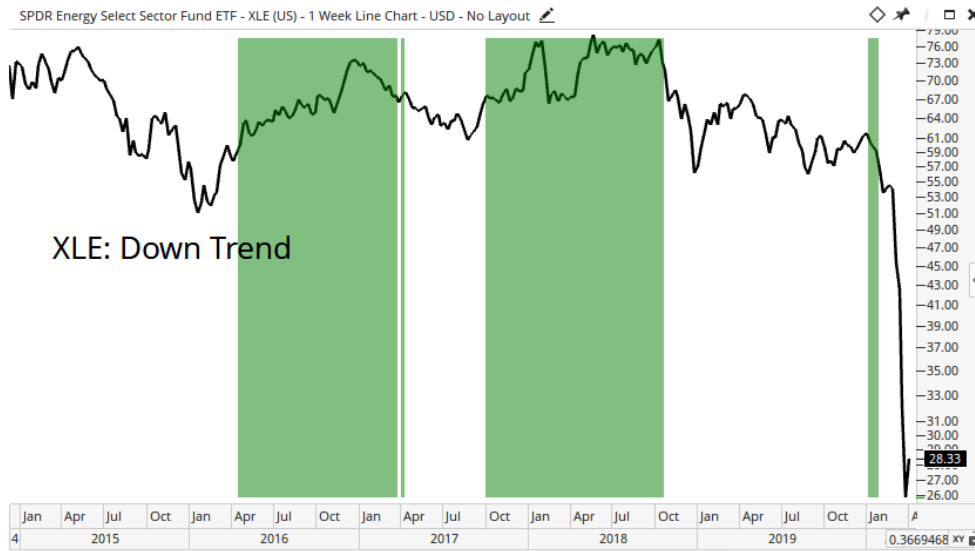
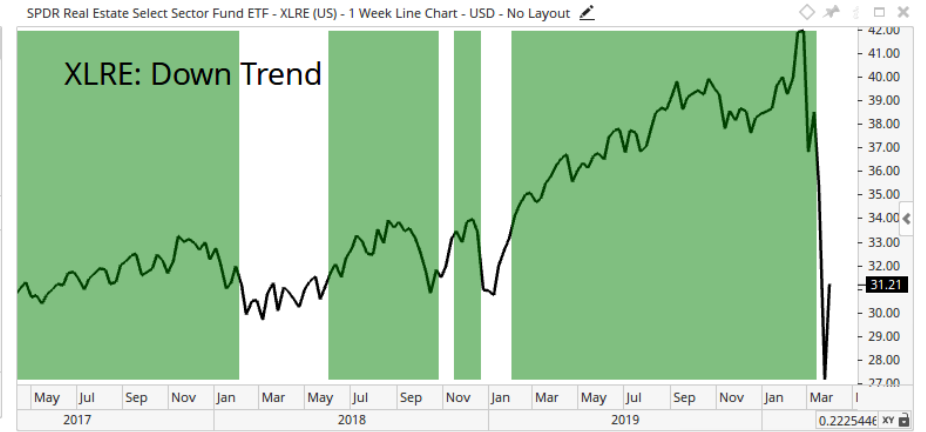
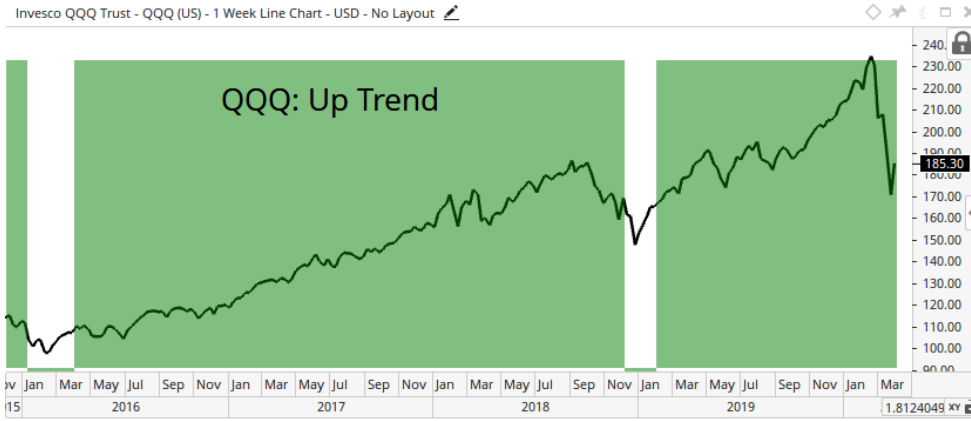


Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2017 2018 2019 2020 29th Mar 2020 20,28,792635 xy





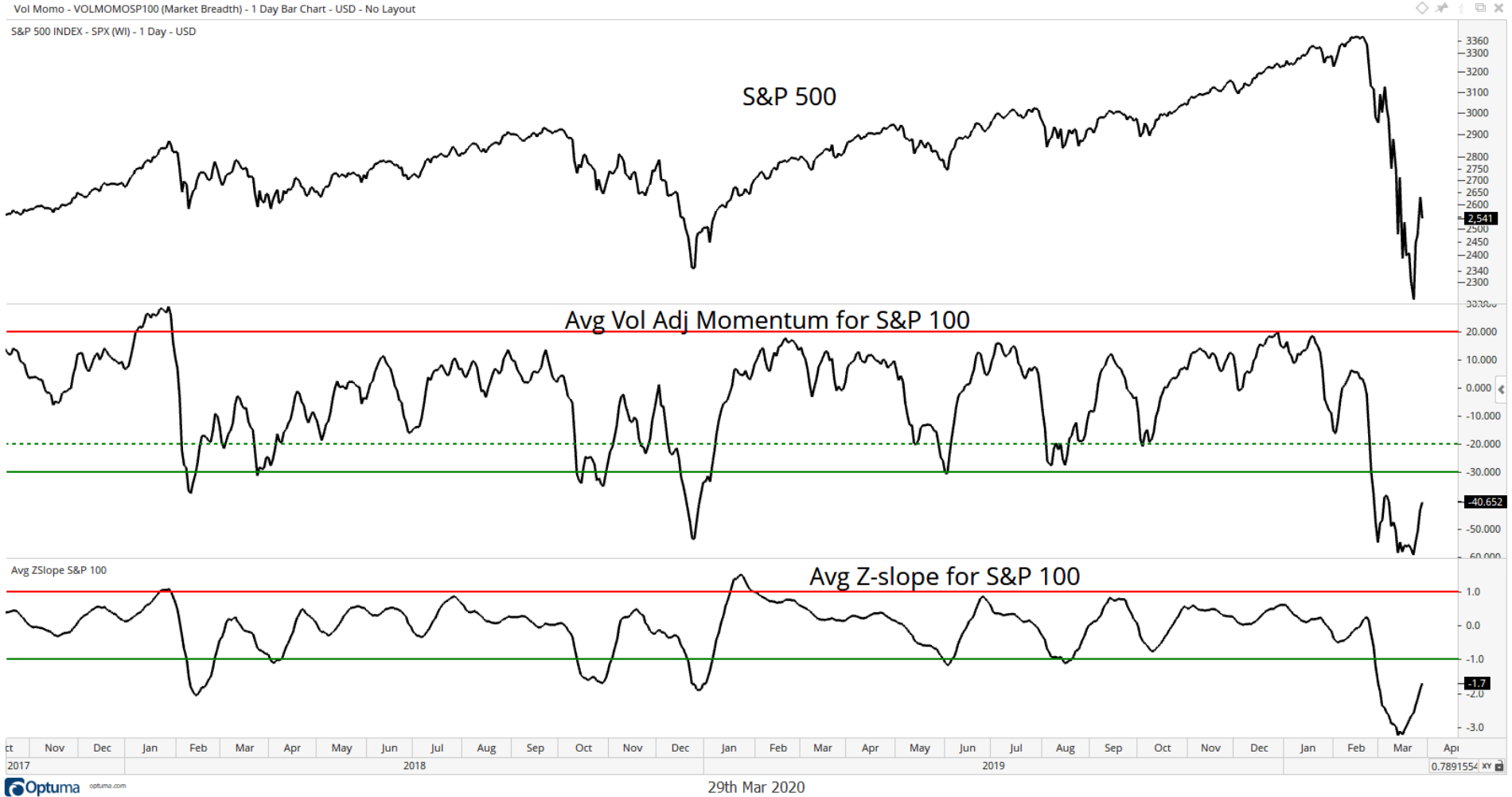




The following charts will become a regular installment for this, and future letters. Each page will include a daily and weekly chart with two indicators that are unique to Thrasher Analytics. With a focus on risk mitigation, the focus of these charts is on potential mean-reversion of each asset through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

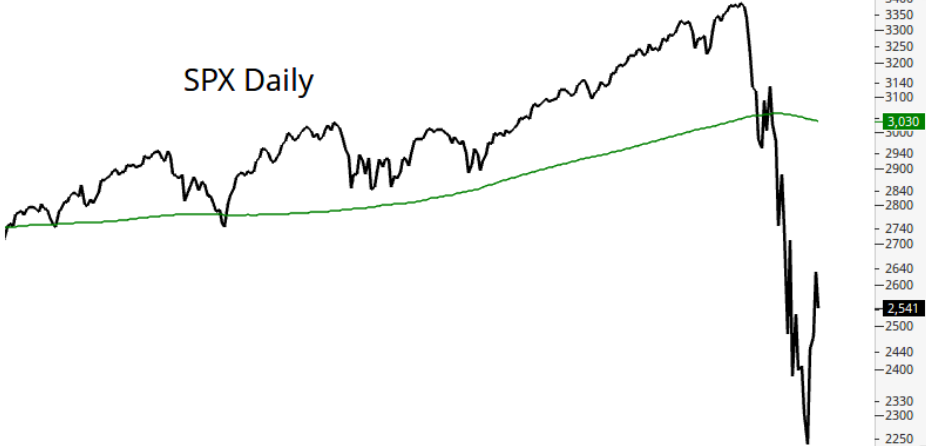
Z-Slope: This indicator takes two lookback periods, one long and one short, for calculating the slope and evaluates the z-score of the difference. This provides insight into whether the current slope of the trend fits within the long-term price history of the security. If a z-score breaks above 2, then 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.



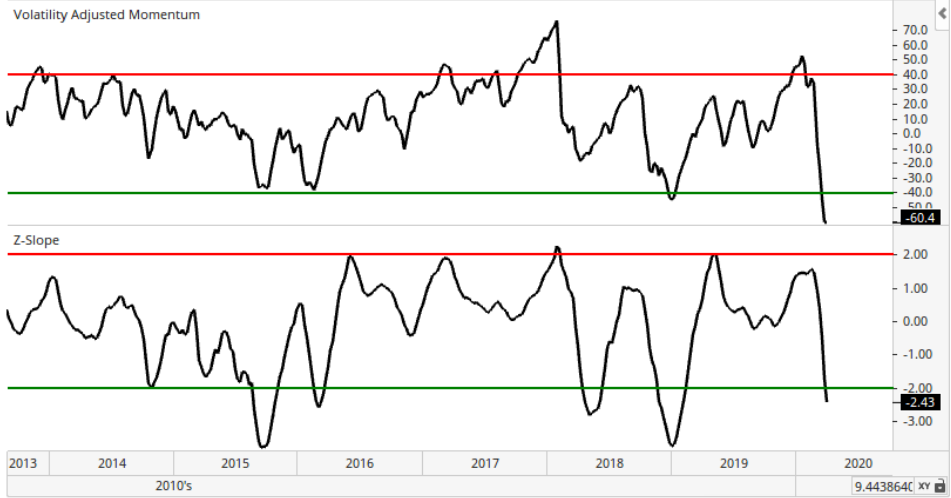
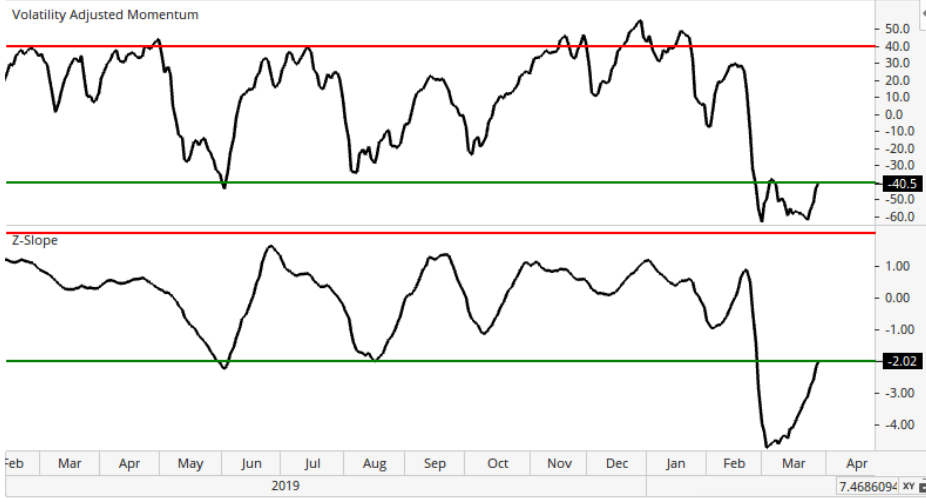
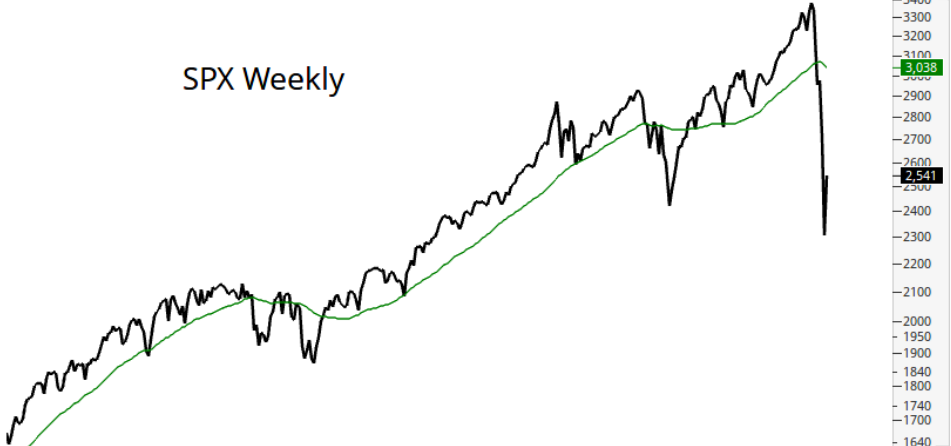
Above are the average Volatility Adjusted Momentum Indicator (VaM) and Z-slope scores for the S&P 100.



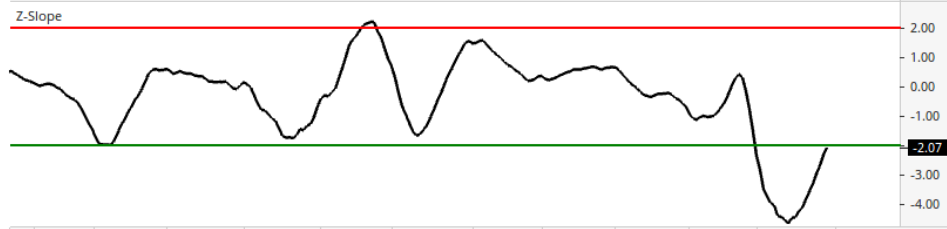
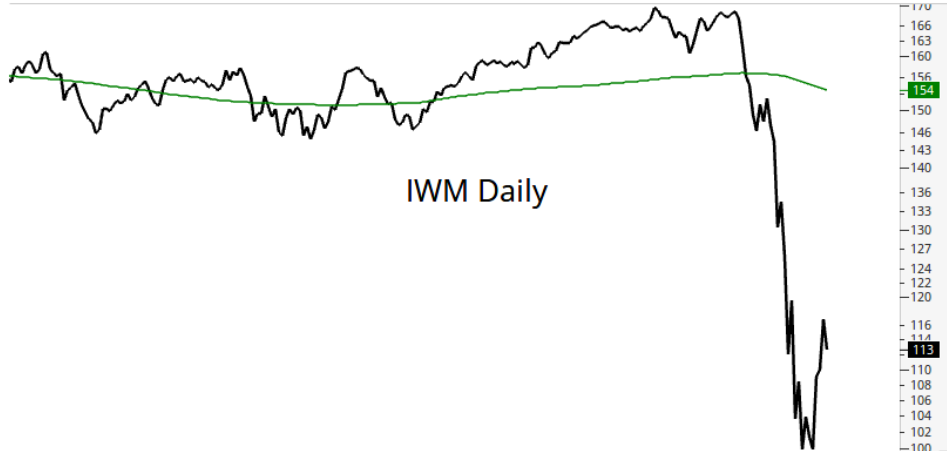
S&P 500 INDEX - SPX (WI) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



S&P 500 INDEX - SPX (WI) - 1 Week Line Chart - USD - No Layout

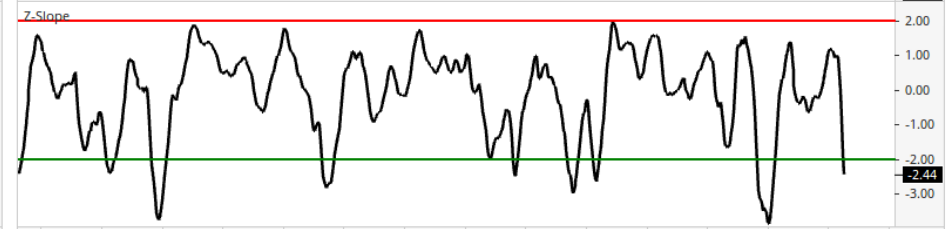
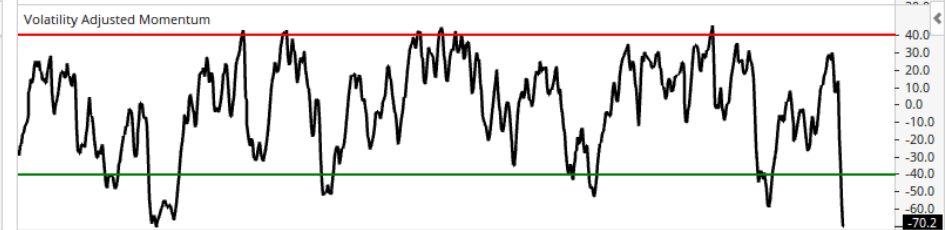
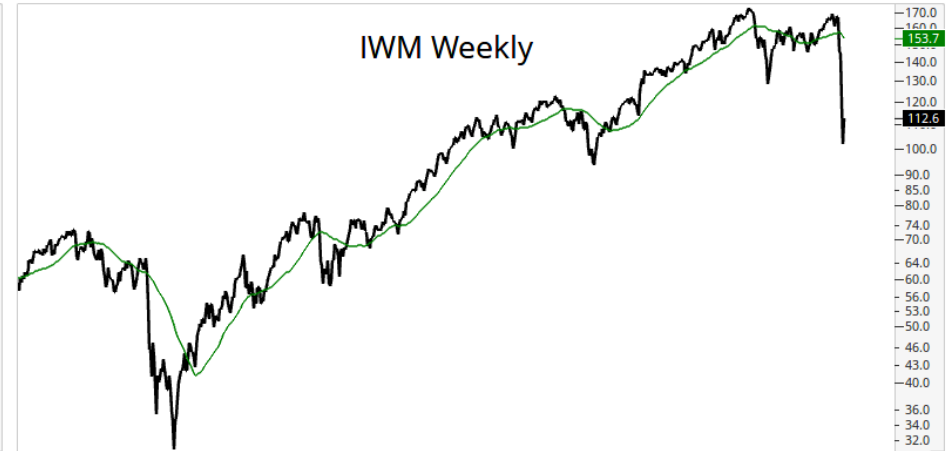


iShares Russell 2000 ETF - IWM (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr
2019 0.5548265 xy

iShares Russell 2000 ETF - IWM (US) - 1 Week Line Chart - USD - No Layout



6 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
2000's 2010's 0.3741333 xy



Invesco QQQ Trust - QQQ (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

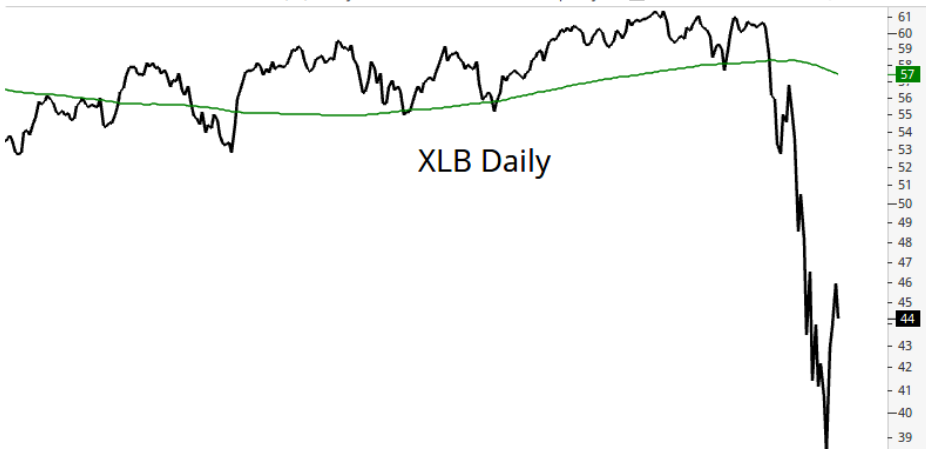


Invesco QQQ Trust - QQQ (US) - 1 Week Line Chart - USD - No Layout

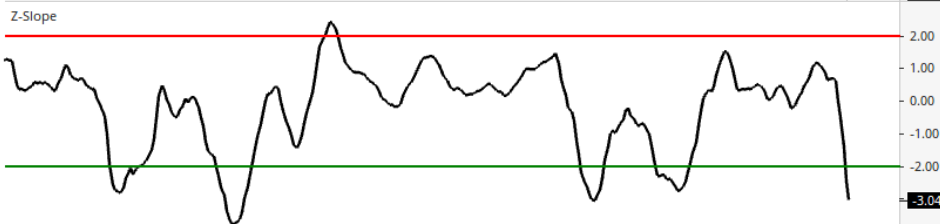
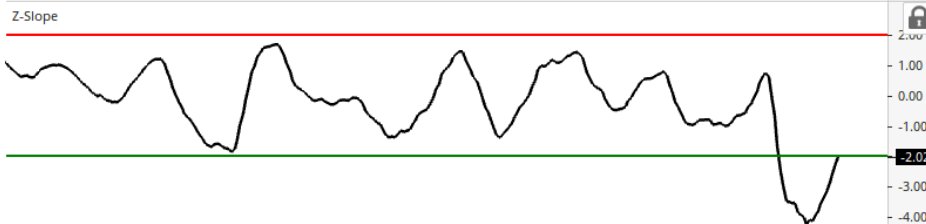
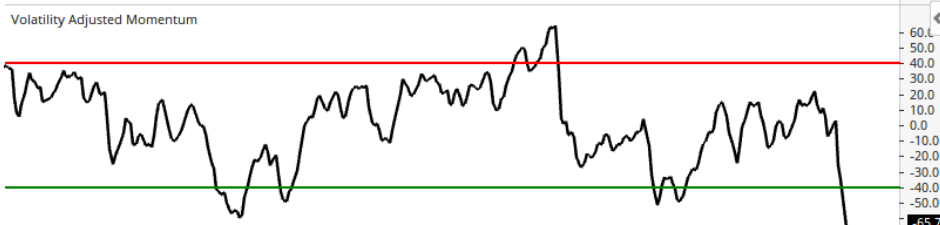
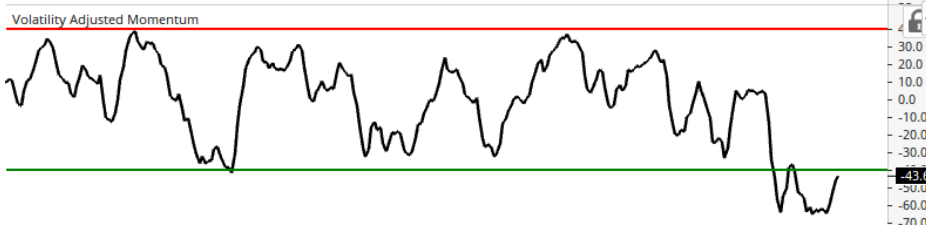




SPDR Materials Select Sector Fund ETF - XLB (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



SPDR Materials Select Sector Fund ETF - XLB (US) - 1 Week Line Chart - USD - No Layout



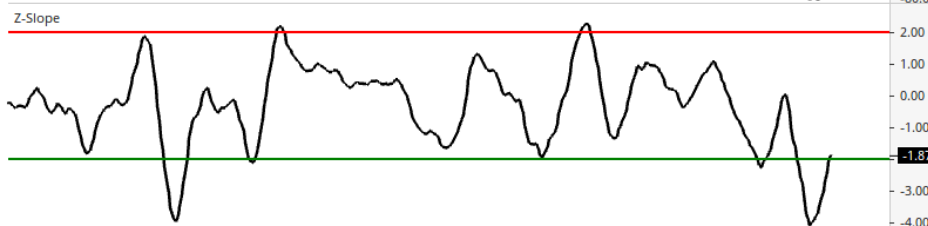
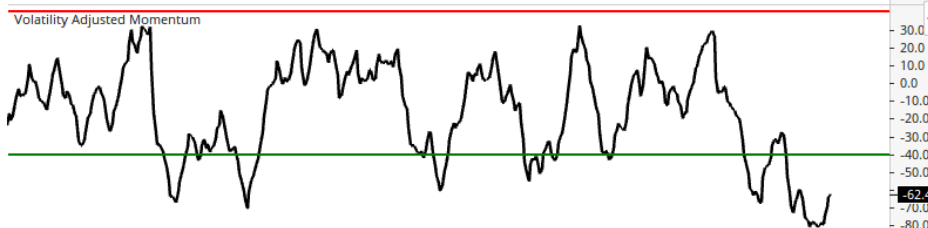
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.1526182 xy

Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul 2014 2015 2016 2017 2018 2019 0.1596182 xy

Optuma optuma.com

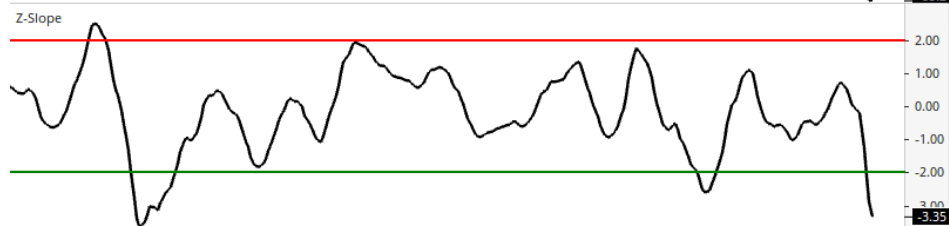
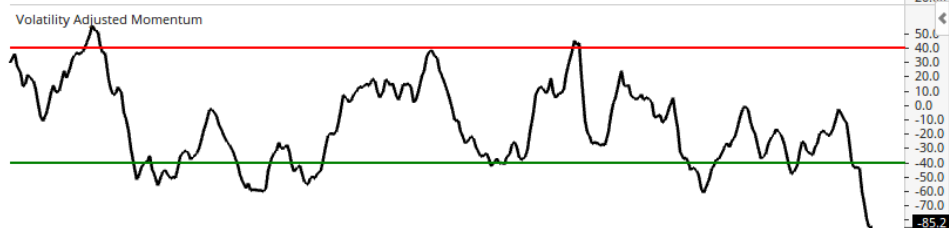
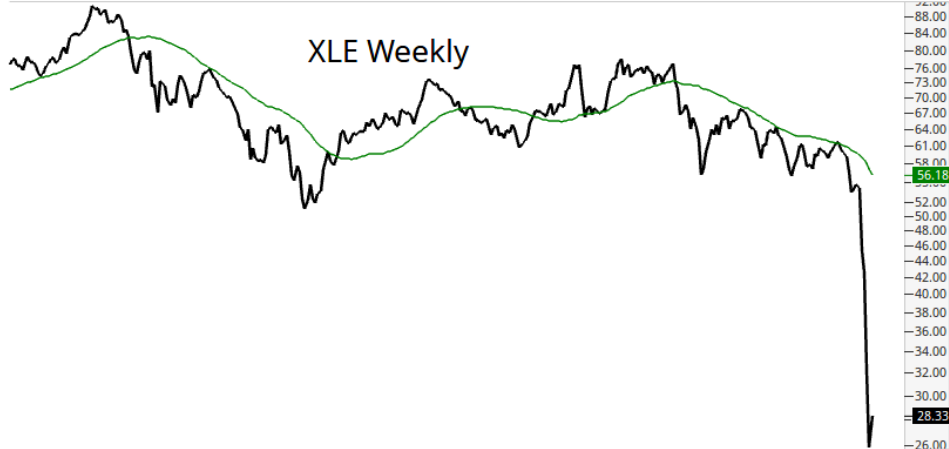
29th Mar 2020

SPDR Energy Select Sector Fund ETF - XLE (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr M 2018 2019 0.230484€ xv

SPDR Energy Select Sector Fund ETF - XLE (US) - 1 Week Line Chart - USD - No Layout

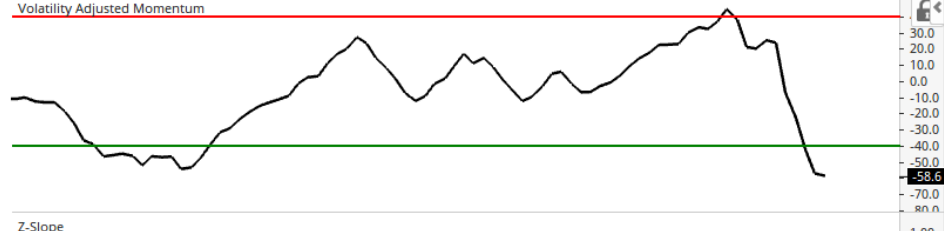
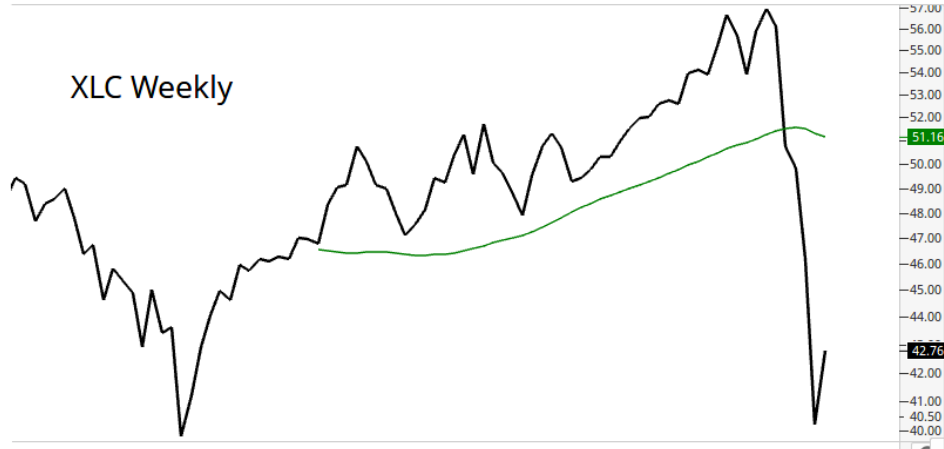
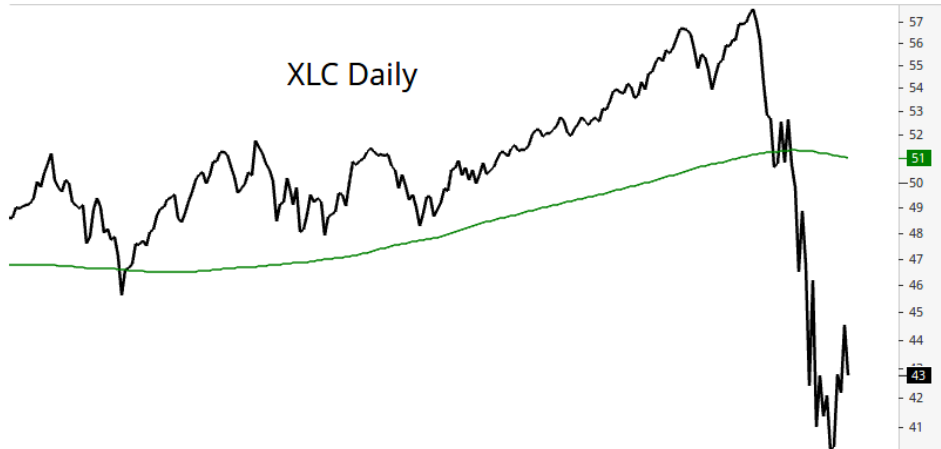


ct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr 2013 2014 2015 2016 2017 2018 2019 0.381142€ xv



SPDR Communication Services Select Sector ETF - XLC (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

SPDR Communication Services Select Sector ETF - XLC (US) - 1 Week Line Chart - USD - No Layout



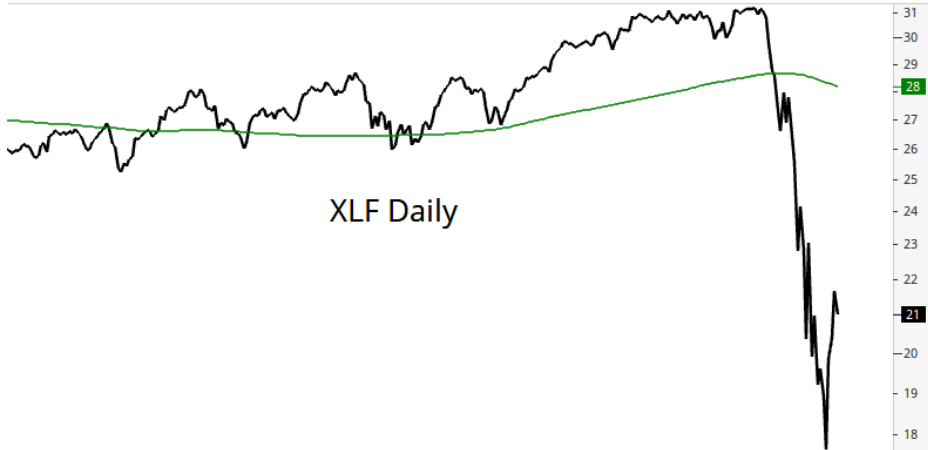
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.1381456 xy

Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May 2018 2019 0.3909636 xy

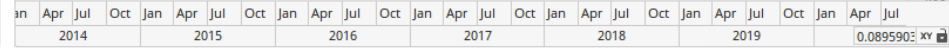
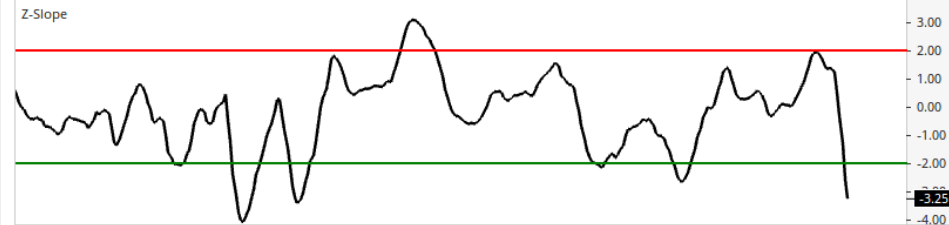
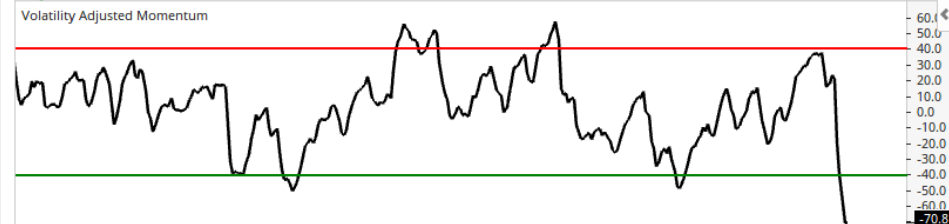
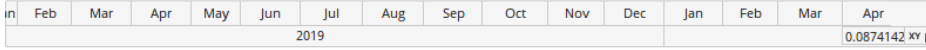
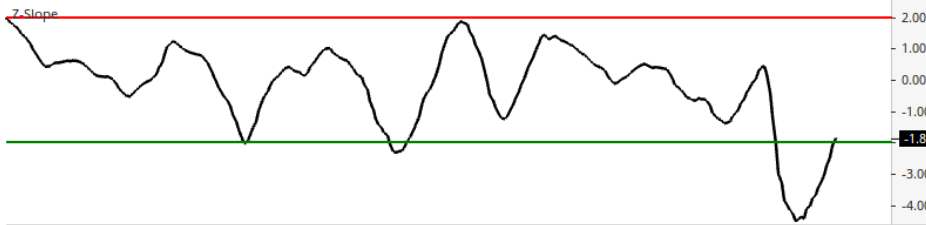
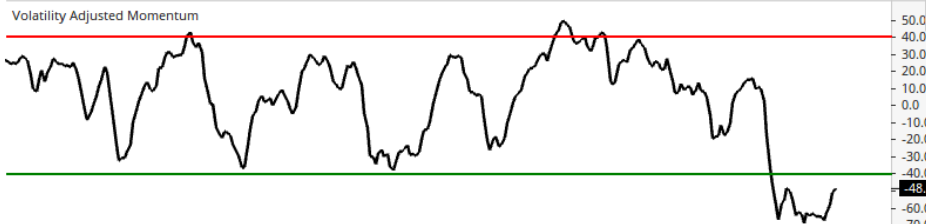


29th Mar 2020

SPDR Financial Select Sector Fund ETF - XLF (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

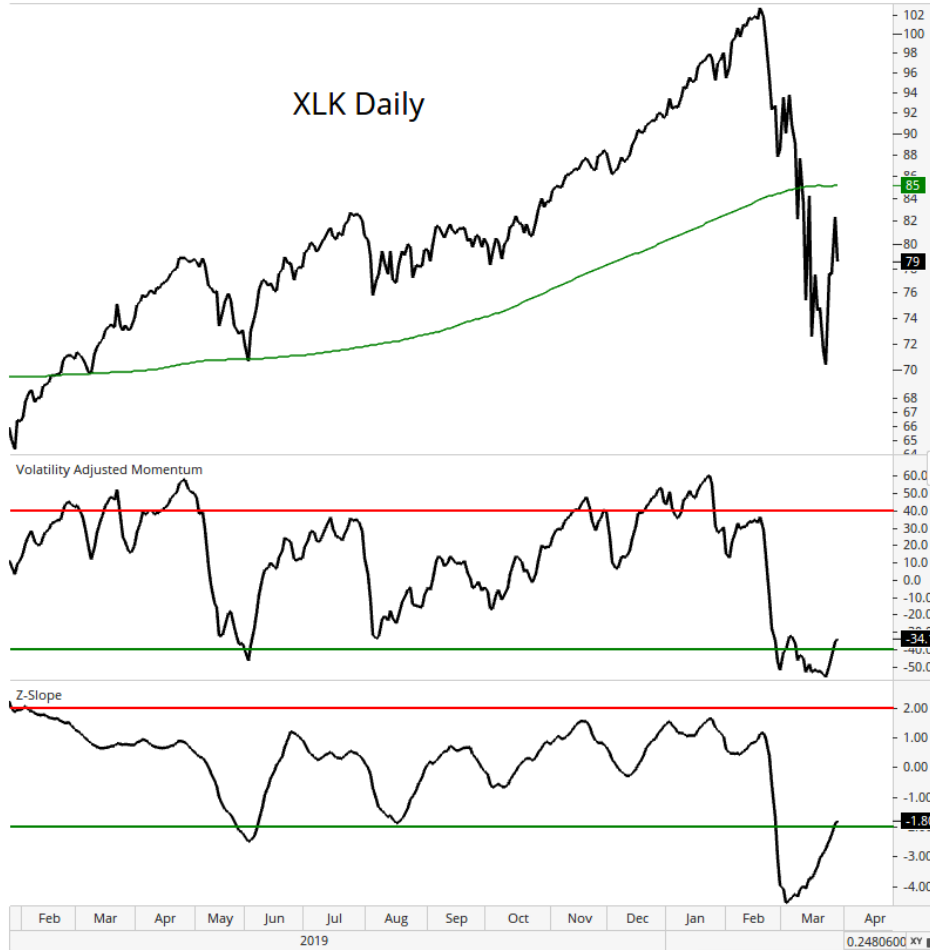


SPDR Financial Select Sector Fund ETF - XLF (US) - 1 Week Line Chart - USD - No Layout

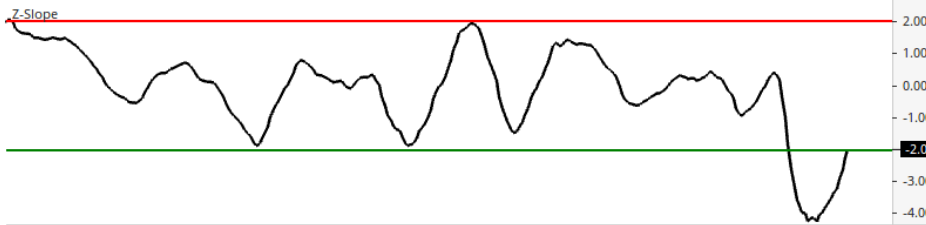
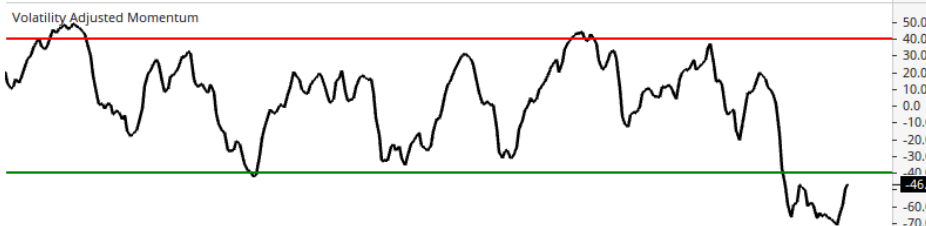
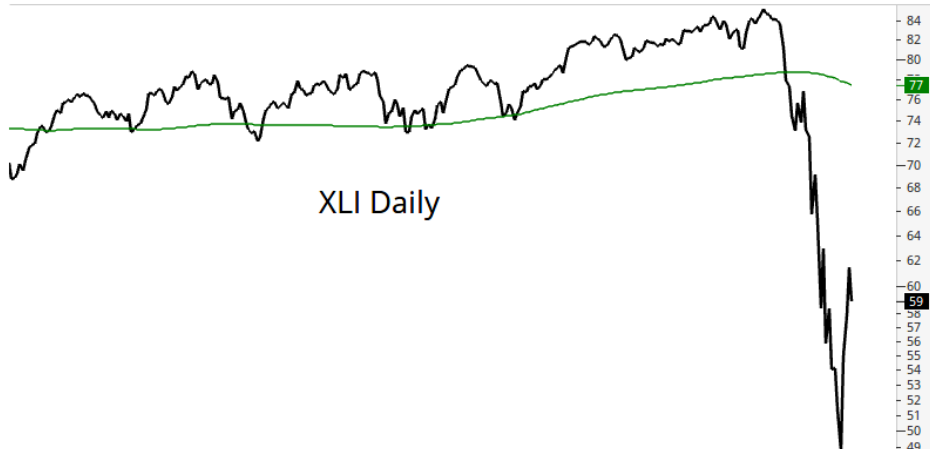


SPDR Technology Select Sector Fund ETF - XLK (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

SPDR Technology Select Sector Fund ETF - XLK (US) - 1 Week Line Chart - USD - No Layout

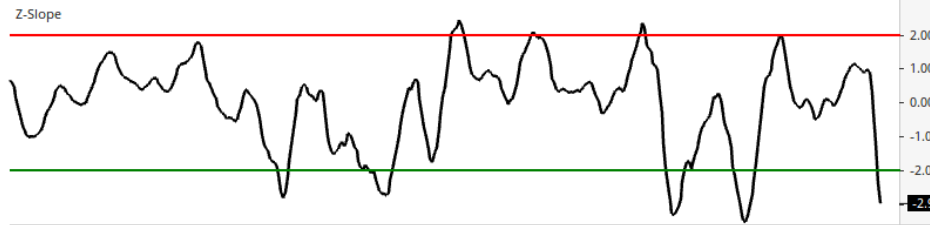
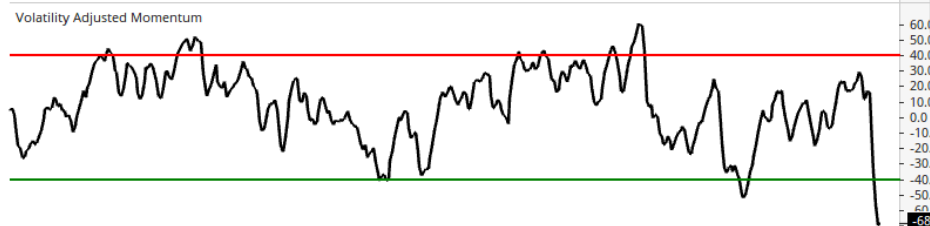


SPDR Industrial Select Sector Fund ETF - XLI (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Ap 2019 0.236221 xy

SPDR Industrial Select Sector Fund ETF - XLI (US) - 1 Week Line Chart - USD - No Layout

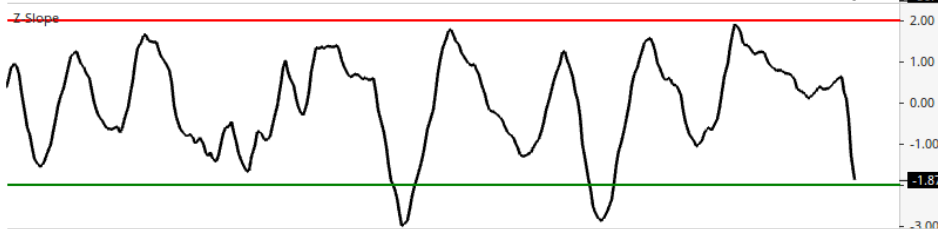
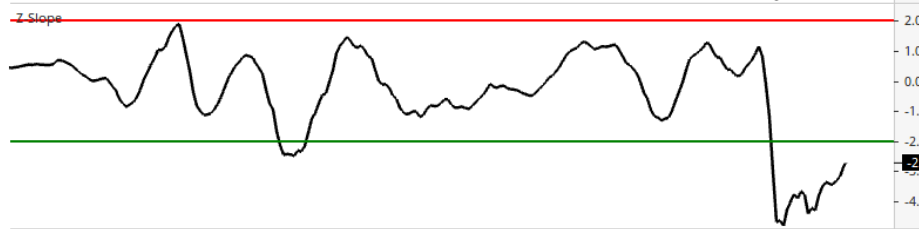
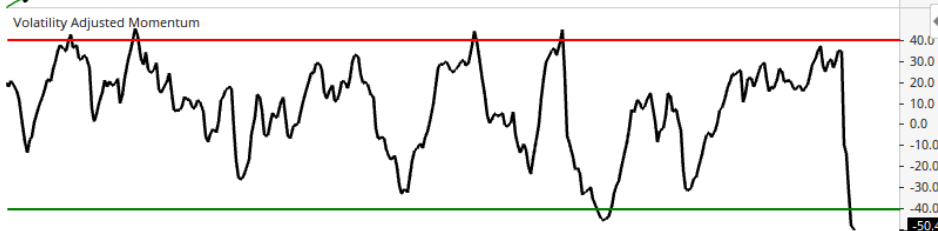
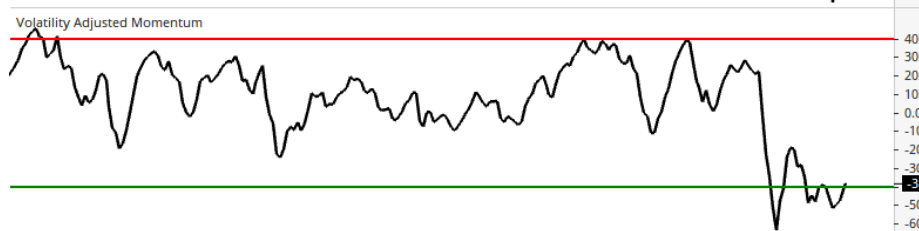
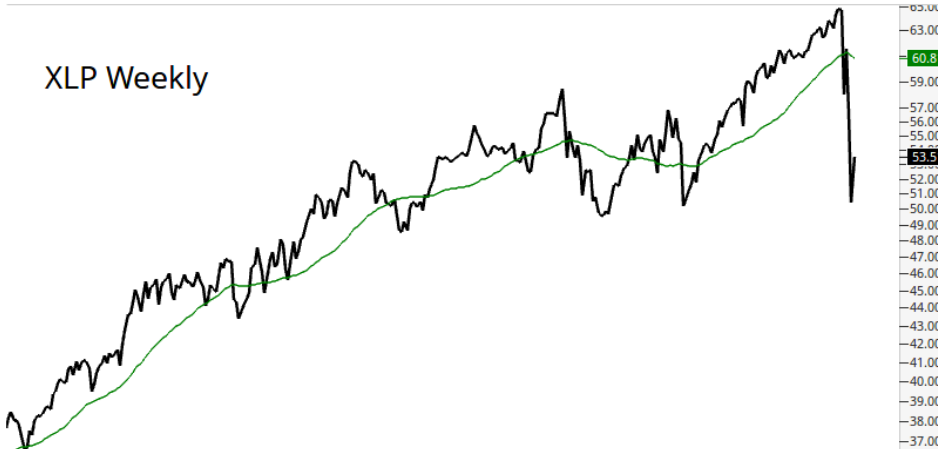
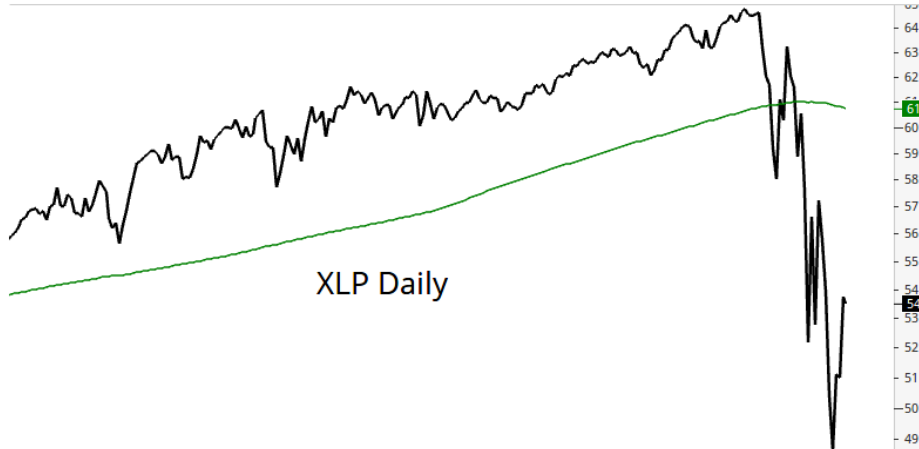


2012 2013 2014 2015 2016 2017 2018 2019 2020 2010's 0.2613357 xy



SPDR Consumer Staples Select Sector Fund ETF - XLP (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

SPDR Consumer Staples Select Sector Fund ETF - XLP (US) - 1 Week Line Chart - USD - No Layout



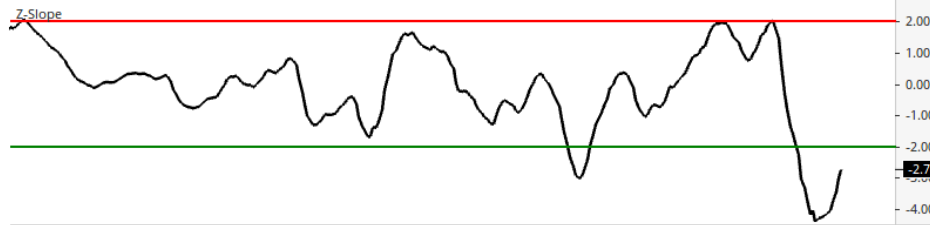
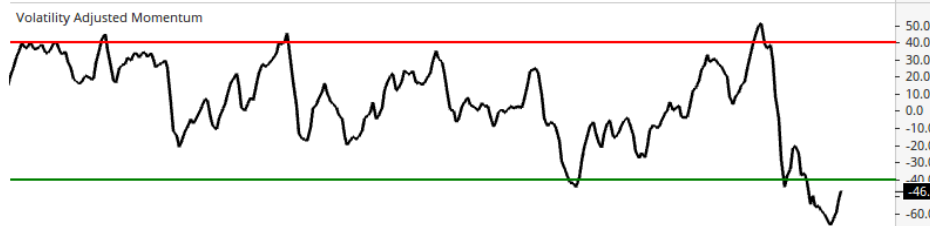
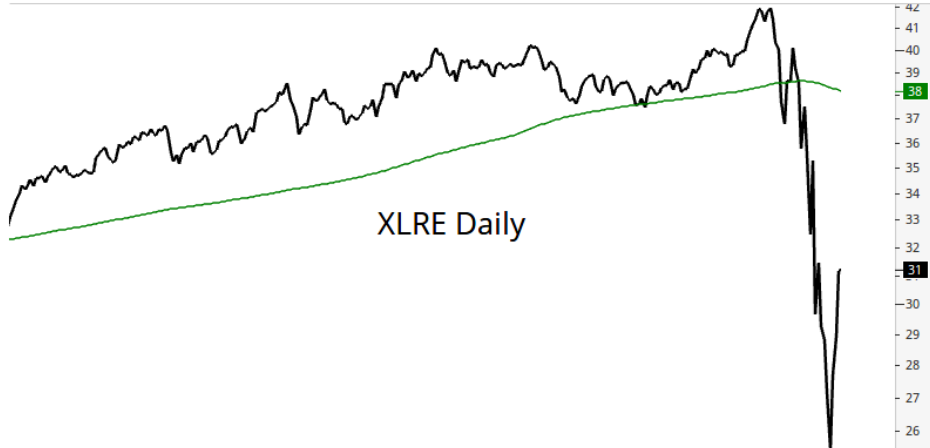
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.1279165 xV

Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul 2014 2015 2016 2017 2018 2019 0.1653035 xV

Optuma optuma.com

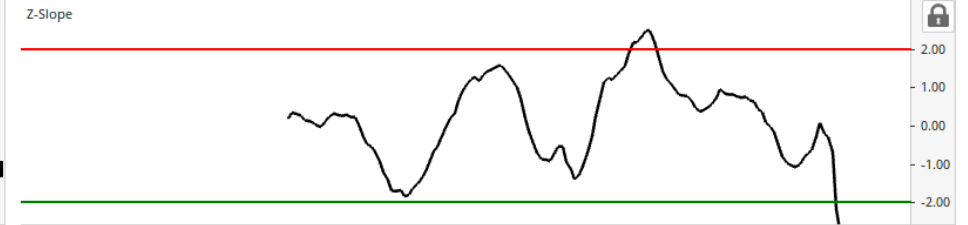
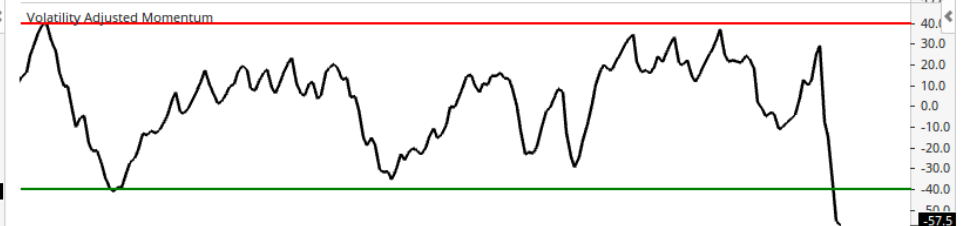
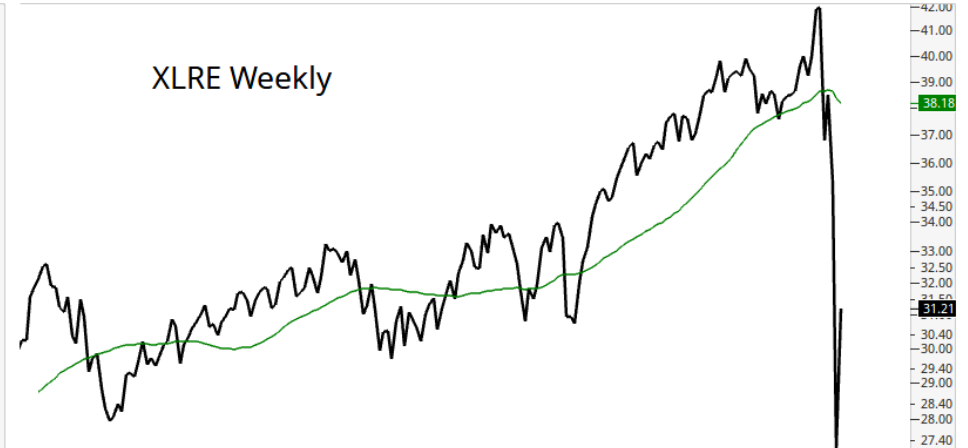
29th Mar 2020

SPDR Real Estate Select Sector Fund ETF - XLRE (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2019														
0.1065664 xy														

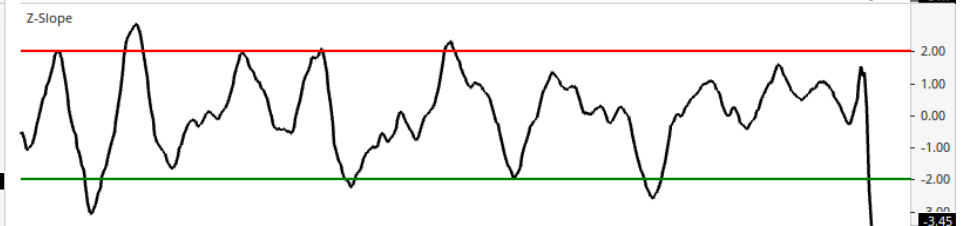
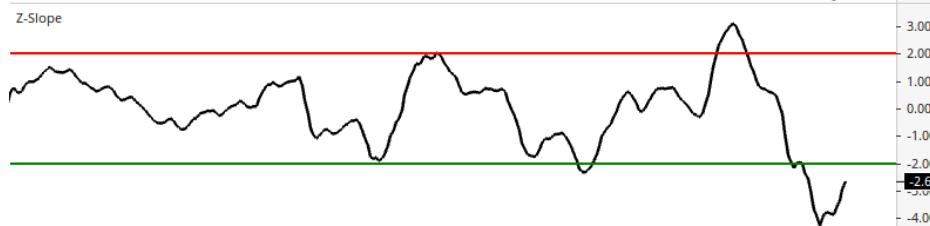
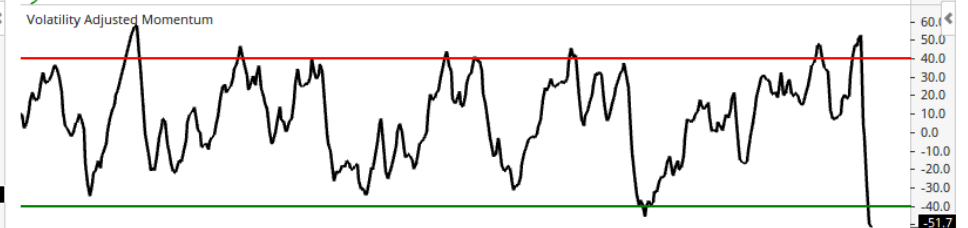
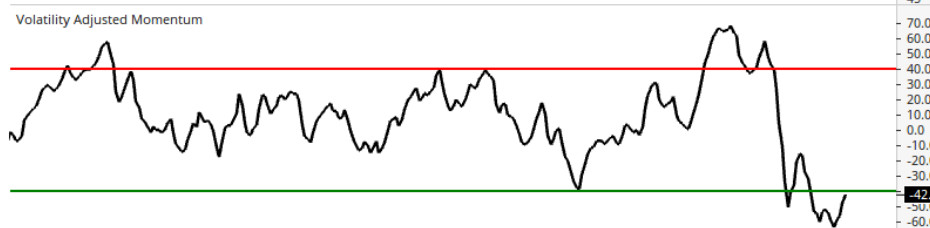
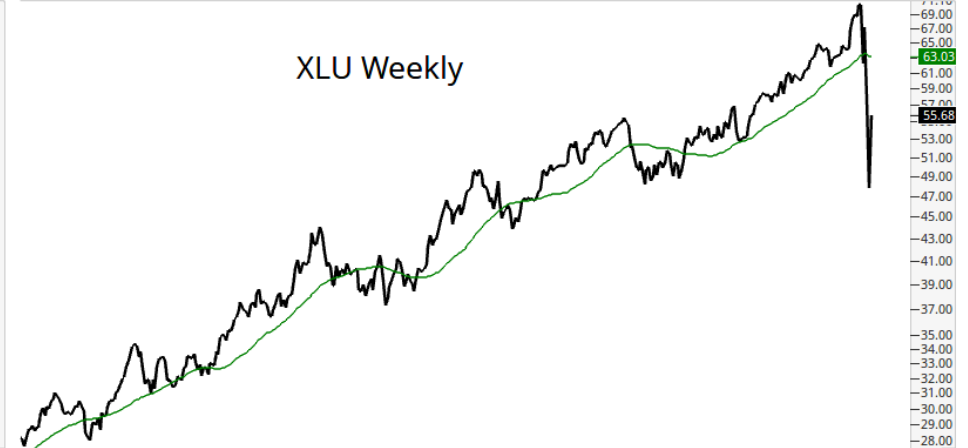
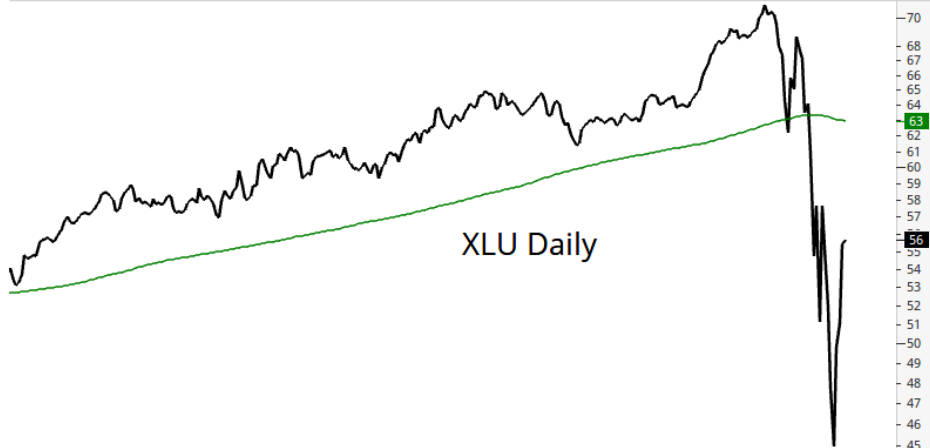
SPDR Real Estate Select Sector Fund ETF - XLRE (US) - 1 Week Line Chart - USD - No Layout



Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul
2016																		
2017																		
2018																		
2019																		
0.1391387 xy																		

SPDR Utilities Select Sector Fund ETF - XLU (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

SPDR Utilities Select Sector Fund ETF - XLU (US) - 1 Week Line Chart - USD - No Layout



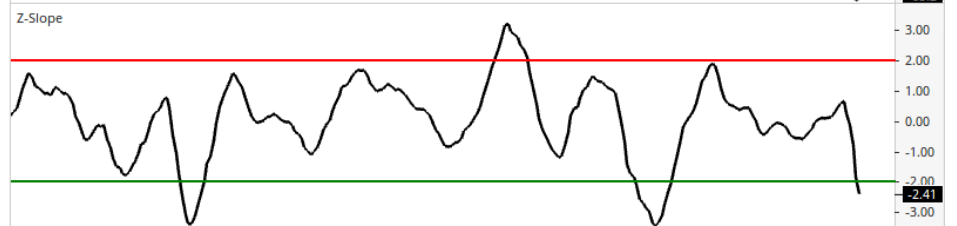
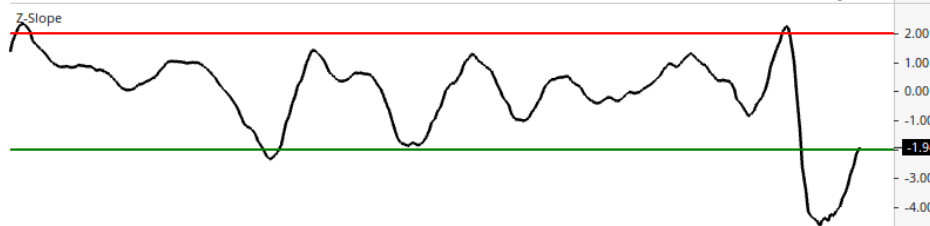
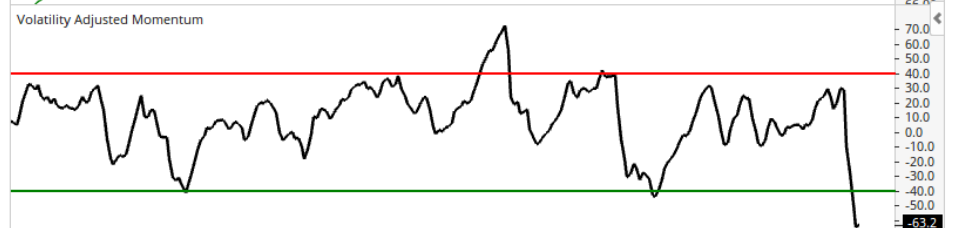
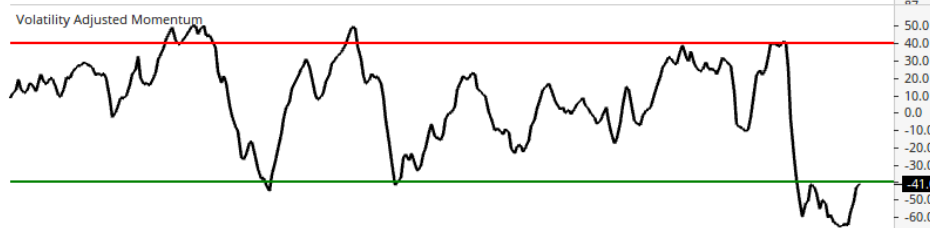
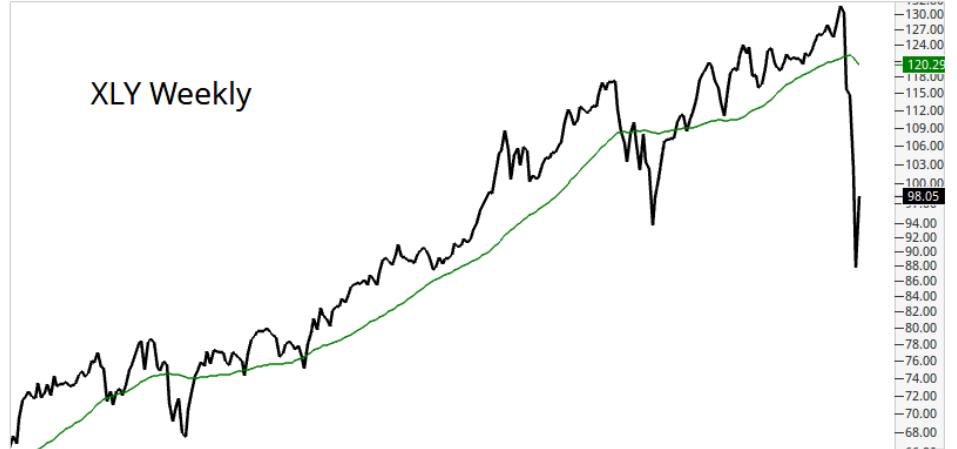
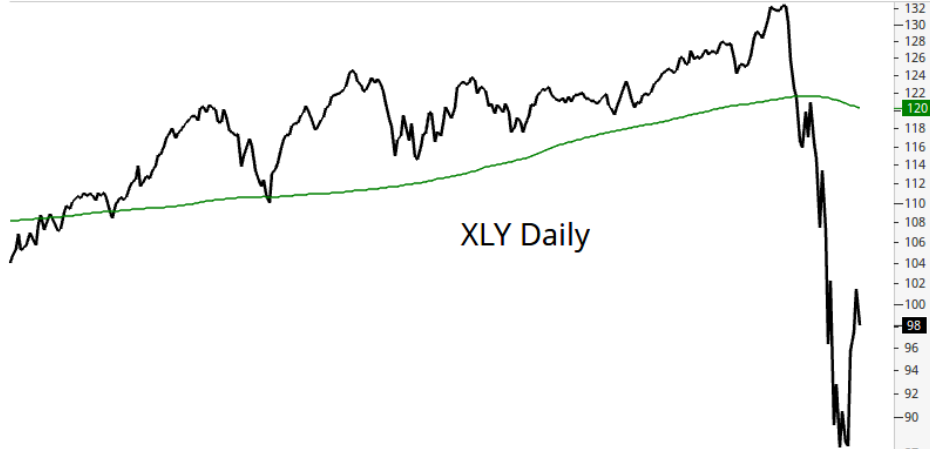
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.1687758 xy

2012 2013 2014 2015 2016 2017 2018 2019 2020 0.1974843 xy



SPDR Consumer Discretionary Select Sector Fund ETF - XLY (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

SPDR Consumer Discretionary Select Sector Fund ETF - XLY (US) - 1 Week Line Chart - USD - No Layout



an Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar A 2019 0.2899389 xy

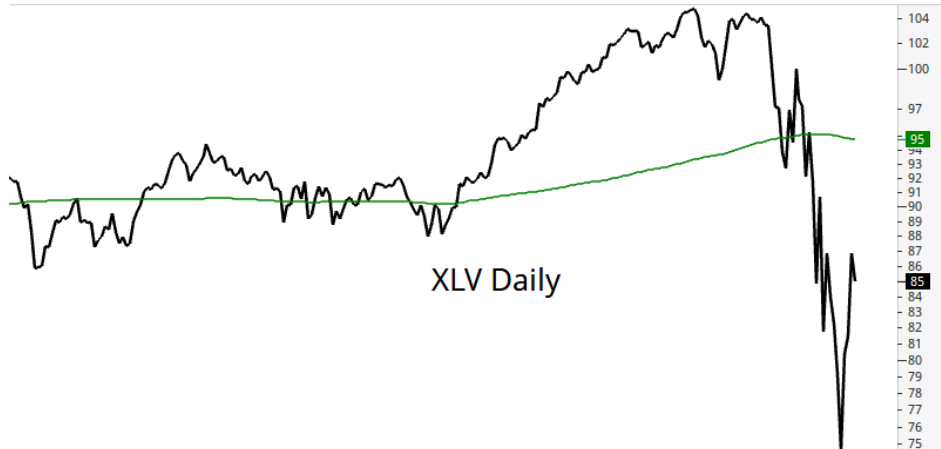
in Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr 2015 2016 2017 2018 2019 0.4634726 xy



29th Mar 2020



SPDR Health Care Select Sector Fund ETF - XLV (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



XLV Daily

Volatility Adjusted Momentum



Z-Slope



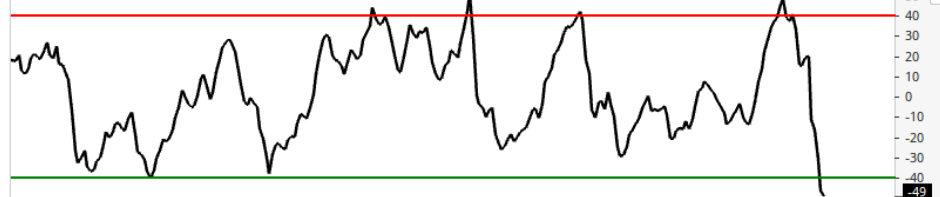
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.2392898 xy

SPDR Health Care Select Sector Fund ETF - XLV (US) - 1 Week Line Chart - USD - No Layout

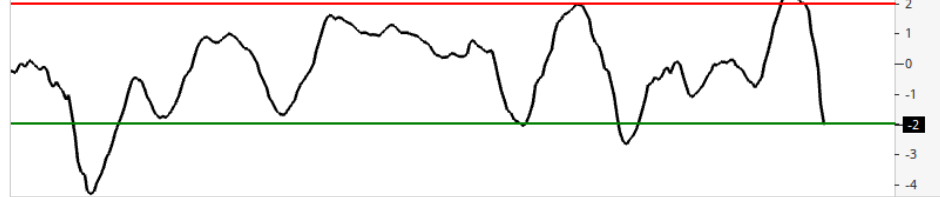


XLV Weekly

Volatility Adjusted Momentum



Z-Slope



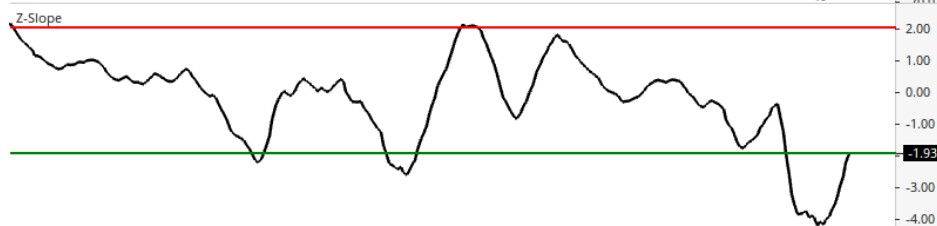
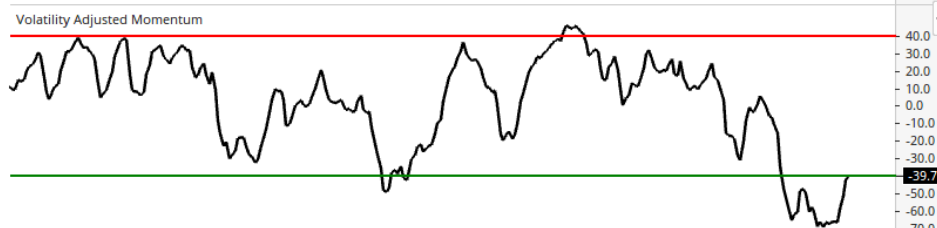
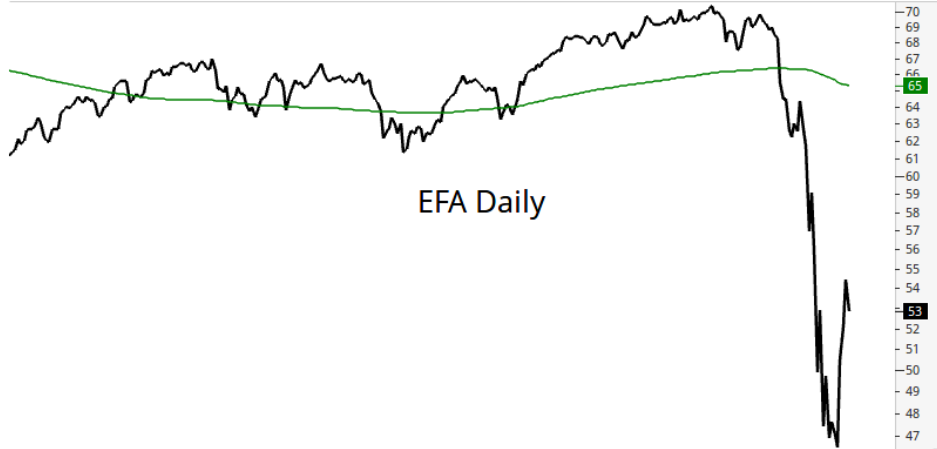
Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul Oct Jan Apr Jul 2015 2016 2017 2018 2019 0.3004522 xy



29th Mar 2020

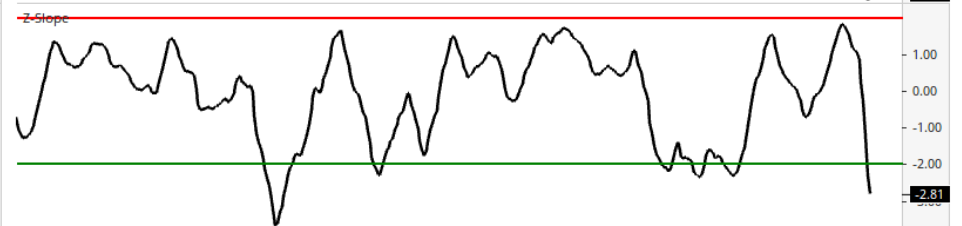
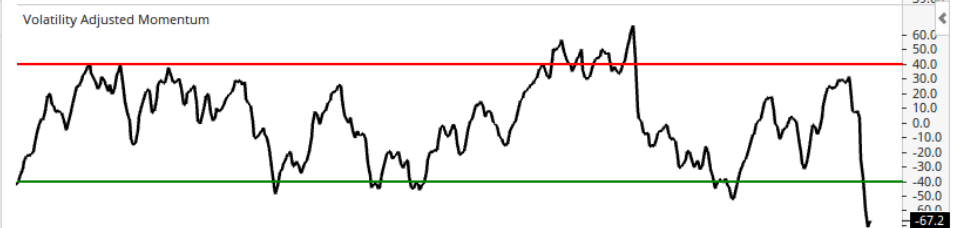


iShares MSCI EAFE Index Fund ETF - EFA (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.154511€ xy

iShares MSCI EAFE Index Fund ETF - EFA (US) - 1 Week Line Chart - USD - No Layout



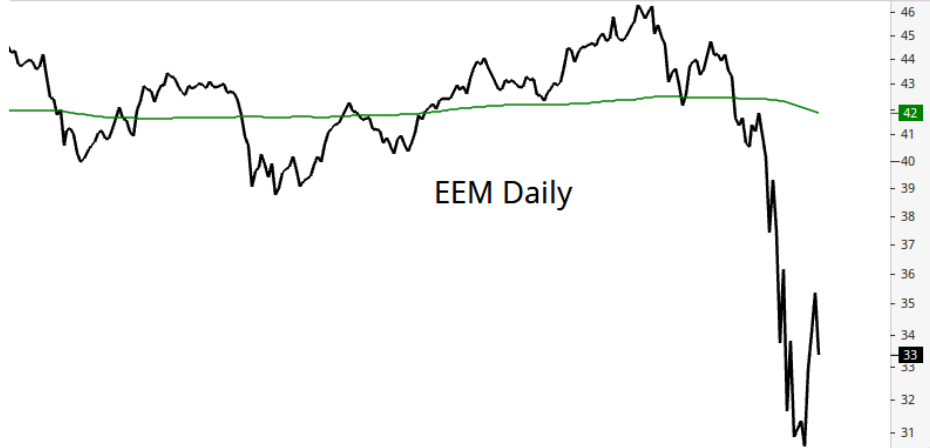
2012 2013 2014 2015 2016 2017 2018 2019 2020 2010's 0.1722877 xy



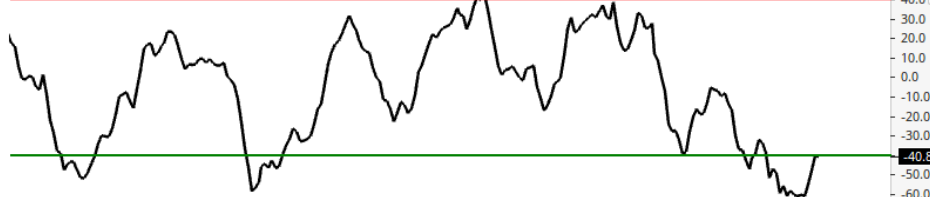
29th Mar 2020



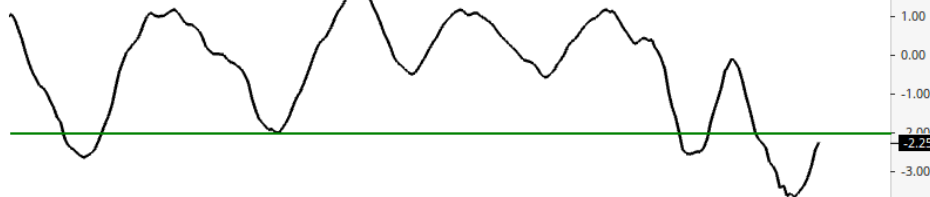
iShares MSCI Emerging Markets ETF - EEM (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Volatility Adjusted Momentum



Z-Slope

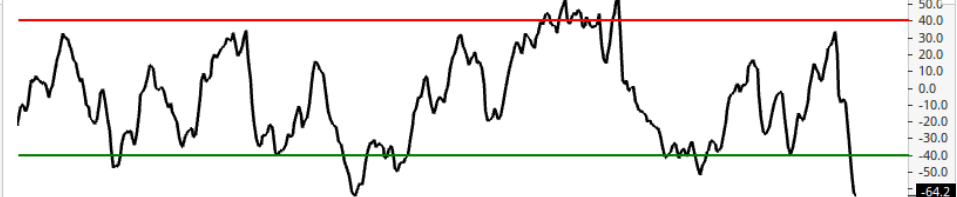


Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr 2019 0.1237017 xy

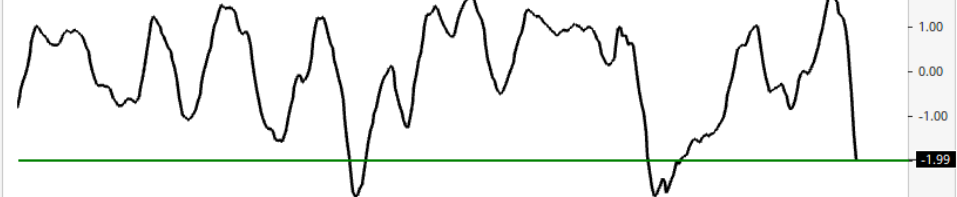
iShares MSCI Emerging Markets ETF - EEM (US) - 1 Week Line Chart - USD - No Layout



Volatility Adjusted Momentum



Z-Slope



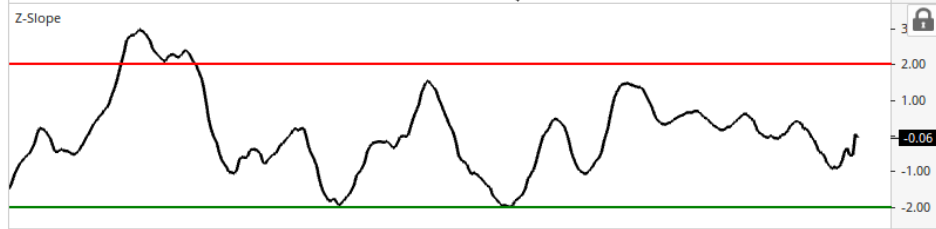
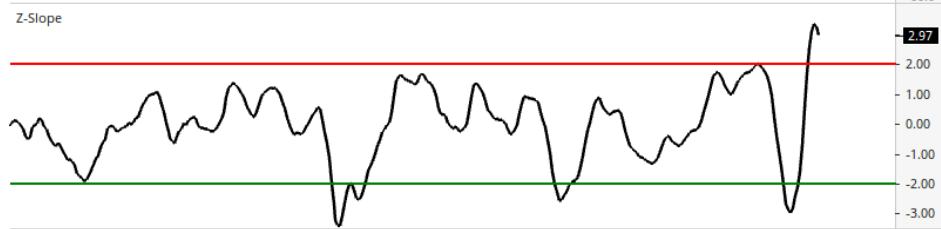
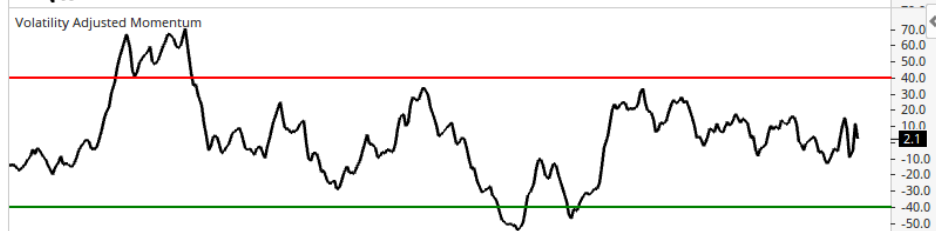
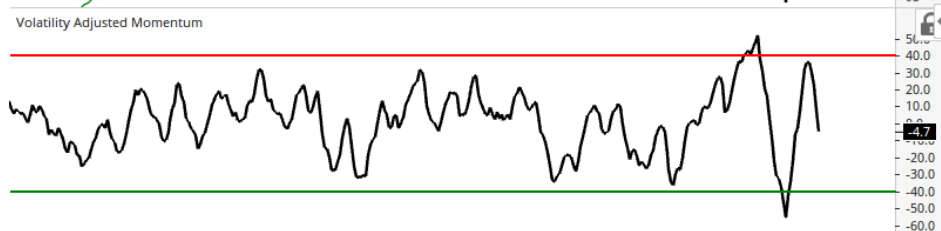
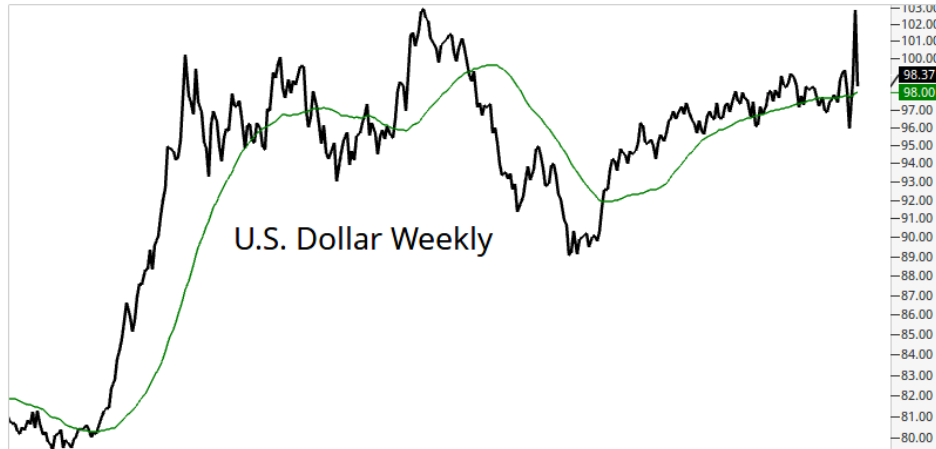
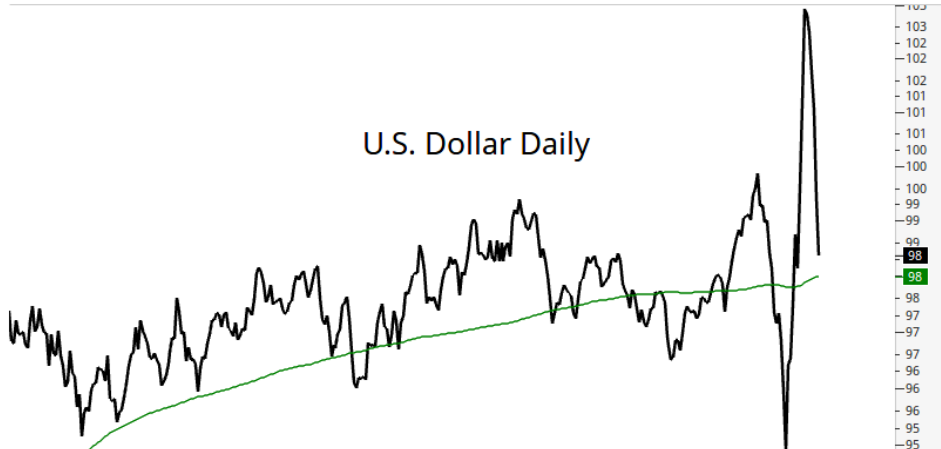
2012 2013 2014 2015 2016 2017 2018 2019 2020 2010's 0.1180745 xy



29th Mar 2020

US Dollar Index - DXY (WI) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

US Dollar Index - DXY (WI) - 1 Week Line Chart - USD - No Layout



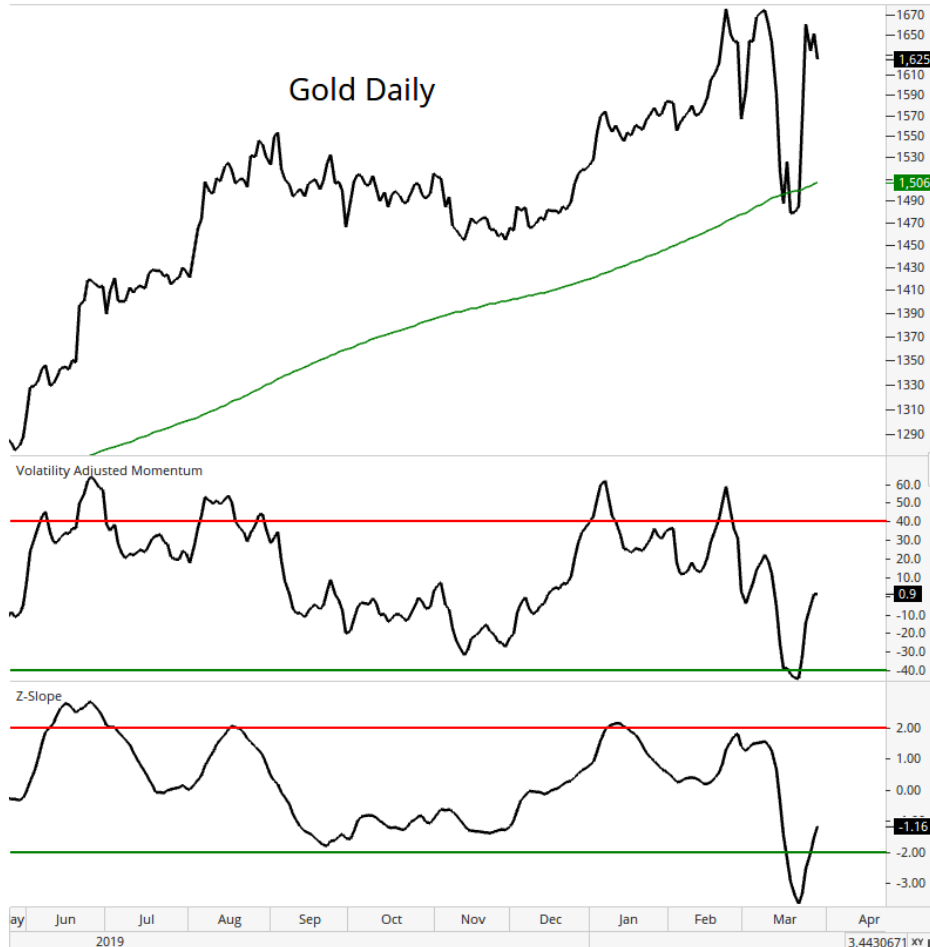
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr M
2018 2019 0.0424665 xy

13 2014 2015 2016 2017 2018 2019 2020
10's 0.1361665 xy



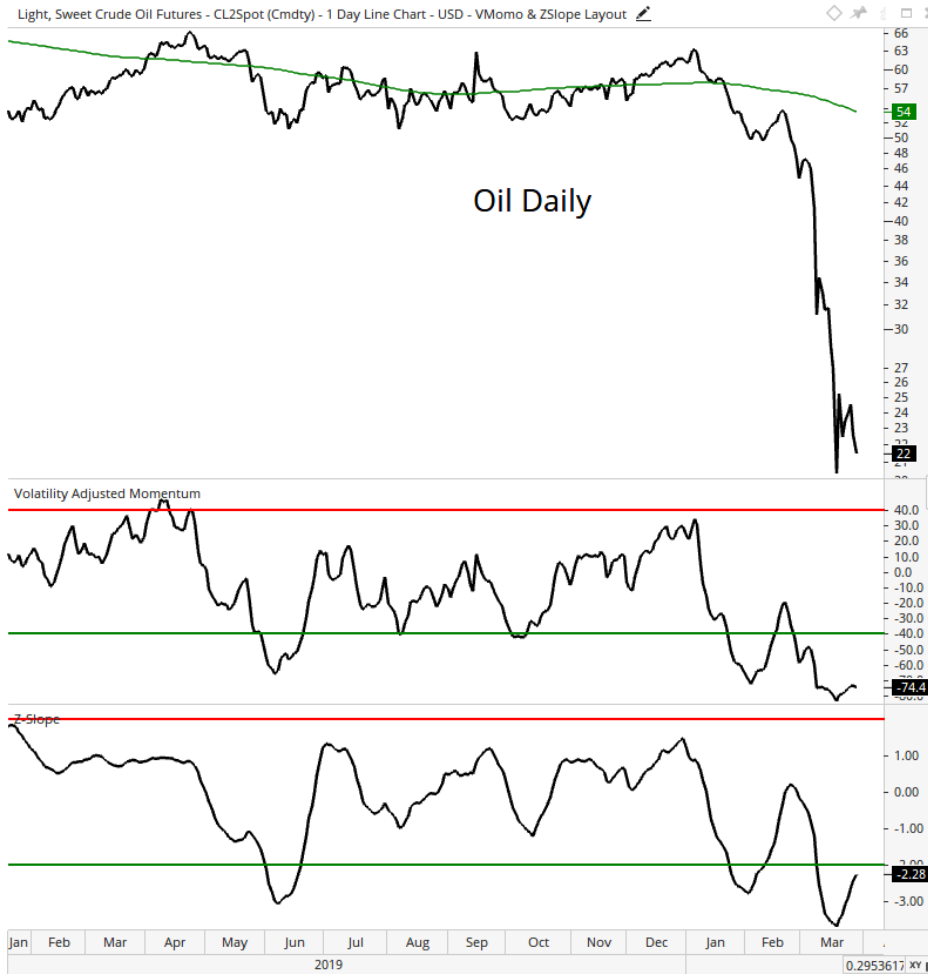
Gold Futures - GCSpot (NYMEX) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

Gold Futures - GCSpot (NYMEX) - 1 Week Line Chart - USD - No Layout



Optuma optuma.com

29th Mar 2020



29th Mar 2020



iShares 20+ Year Treasury Bond ETF - TLT (US) - 1 Day Line Chart - USD - VMomo & ZSlope Layout

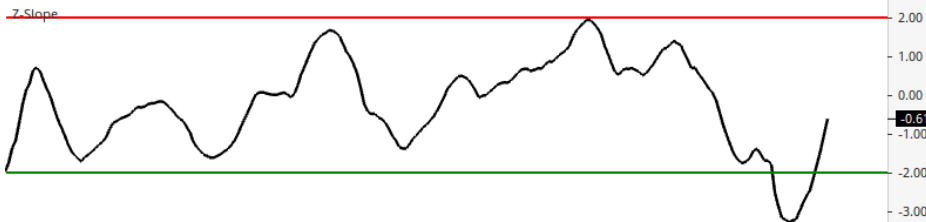
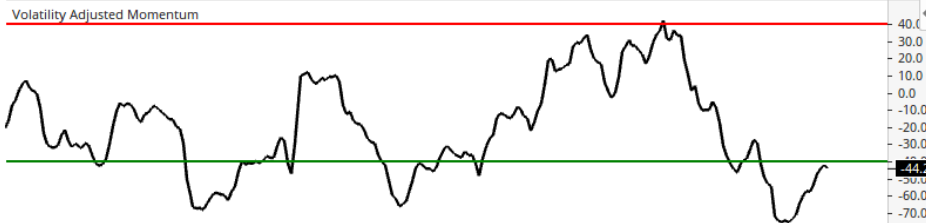
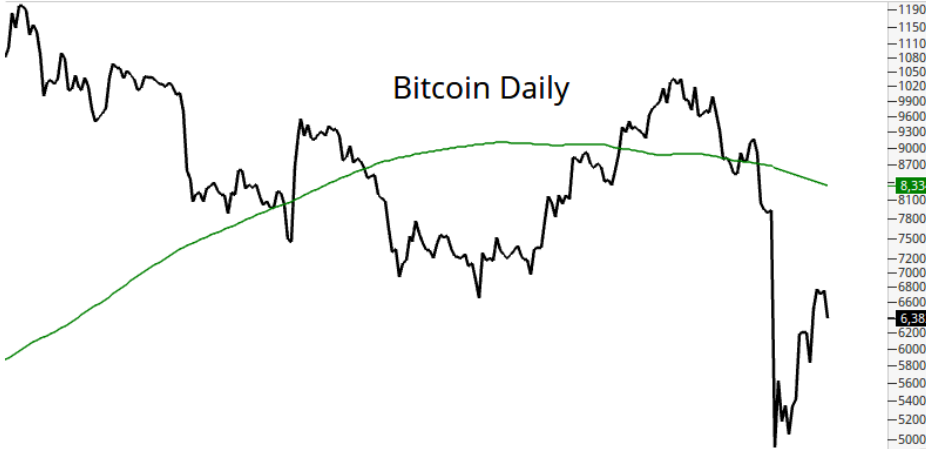


iShares 20+ Year Treasury Bond ETF - TLT (US) - 1 Week Line Chart - USD - No Layout



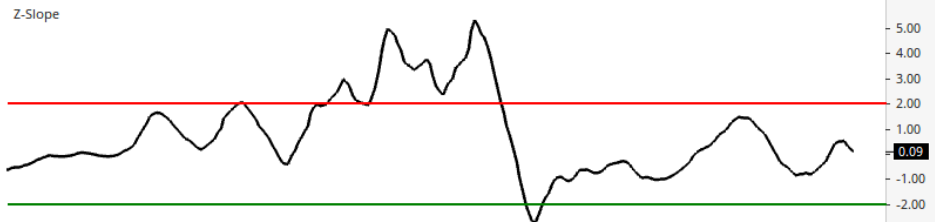
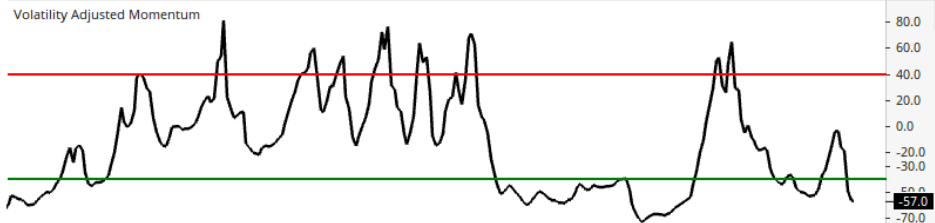
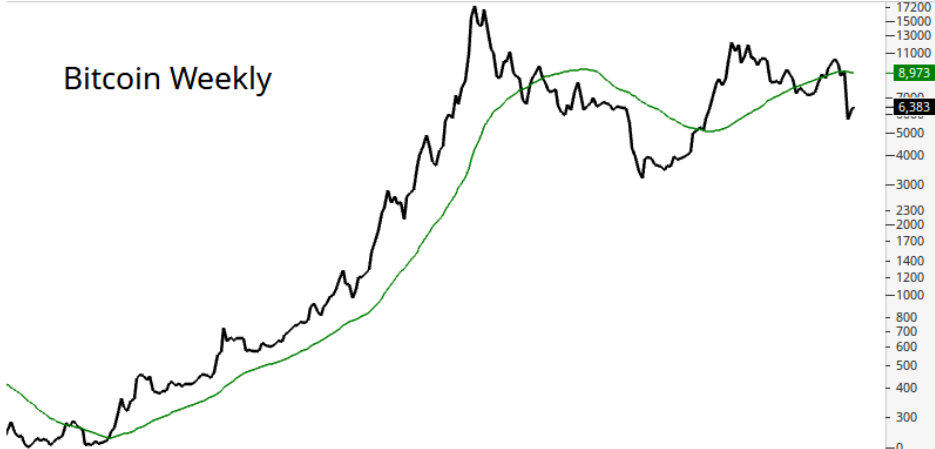


Bitcoin / US Dollar - XBTUSD (FX) - 1 Day Line Chart - USD - VMomo & ZSlope Layout



Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2019								55.81855€ xy

Bitcoin / US Dollar - XBTUSD (FX) - 1 Week Line Chart - USD - No Layout

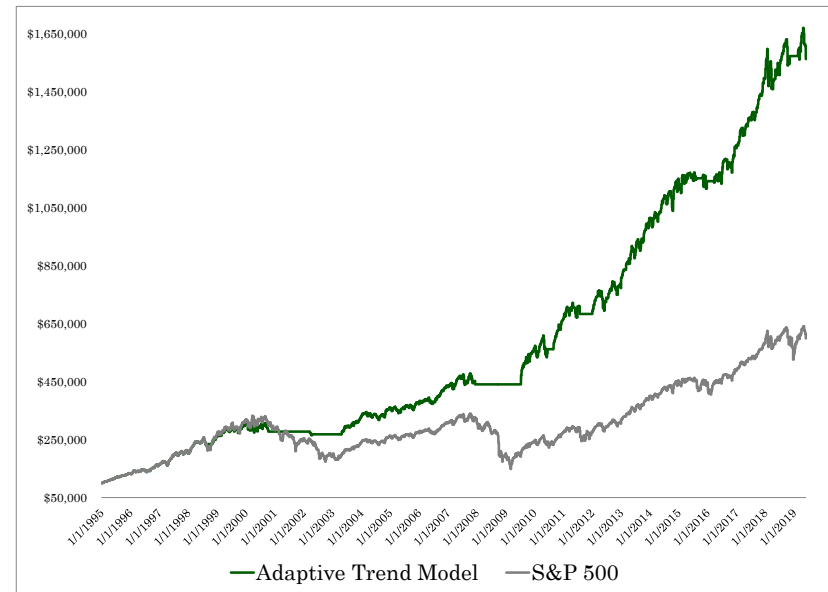
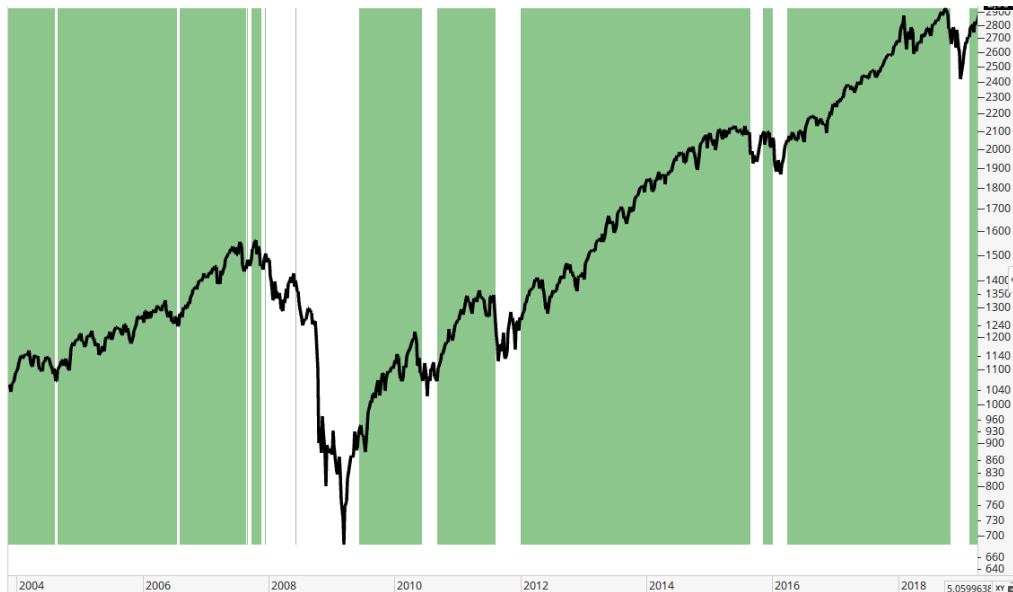


Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr		
2015				2016			2017			2018		2019		125.1956€ xy

29th Mar 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.

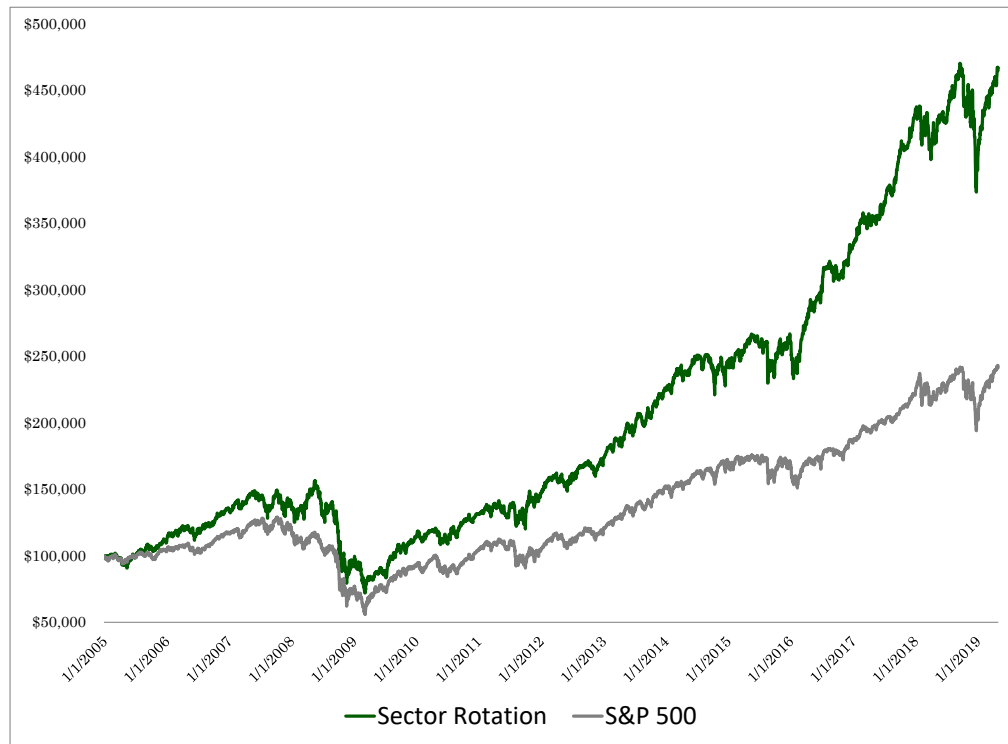


	Annualized Return	Annualized Volatility	Beta	Sharpe	Maximum Drawdown
Adaptive	12.5%	10.3%	0.47	0.97	14.1%
S&P 500	8.9%	15.3%	1	0.42	56.6%

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.

Please see complete disclosure for additional information.

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.

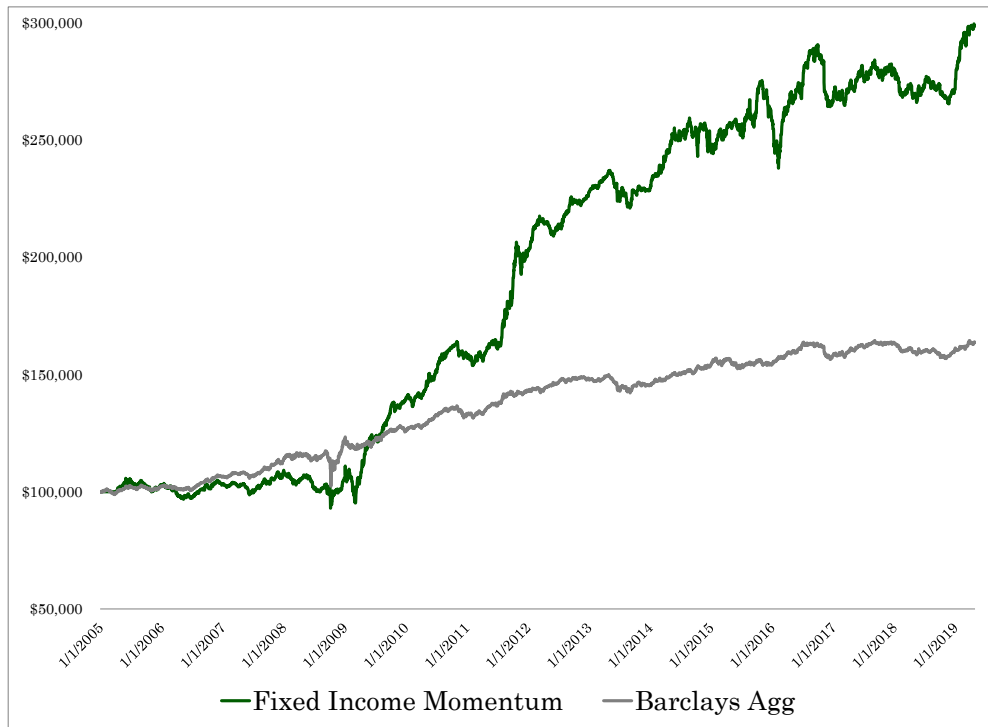


	Annualized Return	Annualized Volatility	Beta	Sharpe	Maximum Drawdown
Sector	12.7%	15.9%	0.96	0.64	53.9%
S&P 500	7.5%	14.8%	1	0.34	56.6%

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.

Please see complete disclosure for additional information.

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.

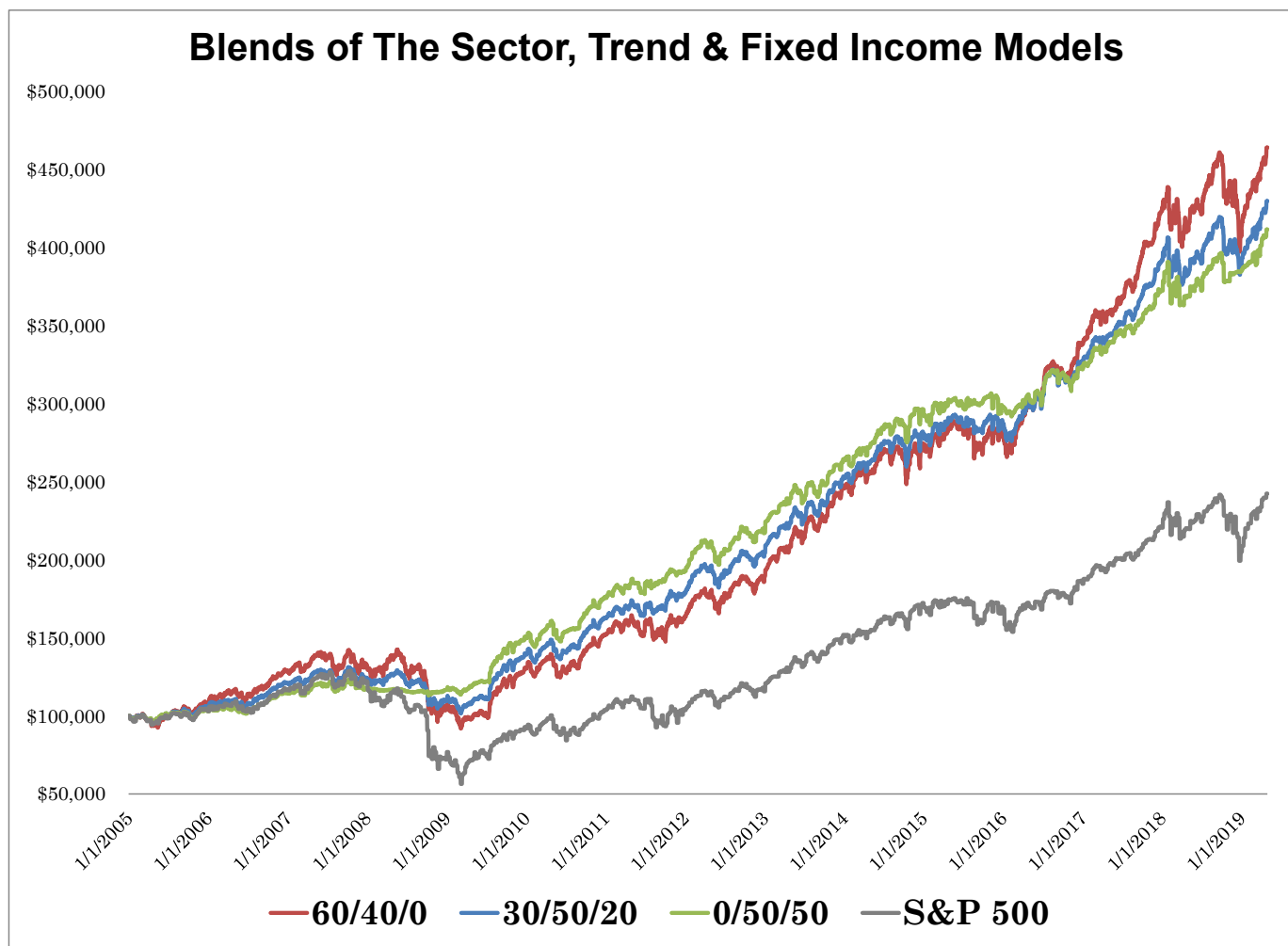


	Annualized Return	Annualized Volatility	Beta	Sharpe	Maximum Drawdown
Fixed Income	8.3%	8.2%	1.04	0.7	14.9%
Barclays Agg	3.6%	3.7%	1	0.29	11.0%

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.

Please see complete disclosure for additional information.

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.

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.

Please see complete disclosure for additional information.

Trend (weekly)	Sector Rotation (monthly)	Fixed Income Momentum (quarterly)
Negative	XLU XLK XLC	TLT AGG

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.

Please see complete disclosure for additional information.

BACK TEST DISCLAIMER:

None of the content published by Thrasher Analytics LLC constitutes a recommendation that any particular security, portfolio of securities, transaction or investment strategy is suitable for any specific person. No representation is being made that the use of this strategy or any system or trading methodology will generate profits and no offer to buy or sell securities is being made.

Back tested performance is NOT an indicator of future actual results. The results reflect performance of a strategy not [historically] offered to investors and do NOT represent returns that any investor actually attained. Back tested results are calculated by the retroactive application of a model constructed on the basis of historical data and based on assumptions integral to the model which may or may not be testable and are subject to losses.

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.

DISCLAIMER:

No reproduction, transmission, or distribution permitted without consent of Thrasher Analytics LLC ("Thrasher Analytics"). The material contained herein is the sole opinion of Thrasher Analytics.

This research has been prepared using information sourced believed to be reliable. Such information has not been independently verified and no guarantee, representation or warranty, express or implied, is made as to its accuracy completeness or correctness. It is intended for the sole use by the receipt to whom it has been delivered to Thrasher Analytics. The delivery of this report to any person shall not be deemed a recommendation by Thrasher Analytics to effect any transaction in any securities discussed herein. For more information please refer to our Terms & Service page of our website: <http://thrasheranalytics.com/terms-of-service-agreement>.