

RIVERSIDE ANALYTICS INC

INVESTORS MASTER CLASS
MODULE #3

RIVERSIDE ANALYTICS INC
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RIVERSIDE'S INVESTOR MASTER CLASS

DISCLAIMER

- All trading / investing comes with risk.
- The insights contained in this presentation do not constitute advice, rather are meant for educational purposes from which you may make more educated decisions taking into account your individual risk profile and needs for return.
- At Riverside, we assess probabilities using systematic quantitative methodology. We do not provide advice. There are no guarantees for positive return. All investing/trading is at your own risk.
- Riverside is about helping active and affluent investors learn how to make better decisions in financial markets.
- All charts shown in this broadcast have been referenced from stockcharts.com, Amibroker or eSignal unless otherwise noted.

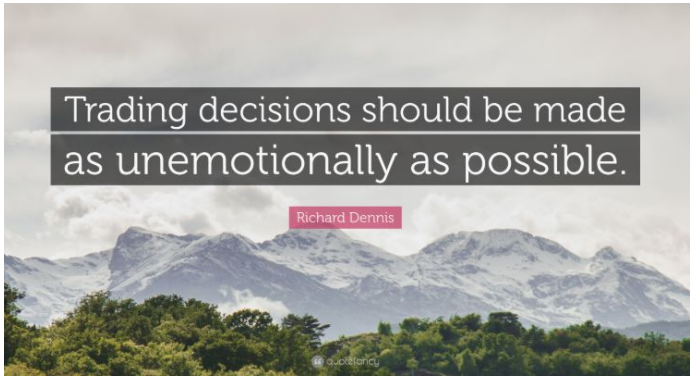
Good investing is not an "event" like finding the next growth opportunity or catching the next market turn. Rather, good investing is a disciplined process that converts research and training into a well-tested methodology, and then makes a habit of following that approach day after day.

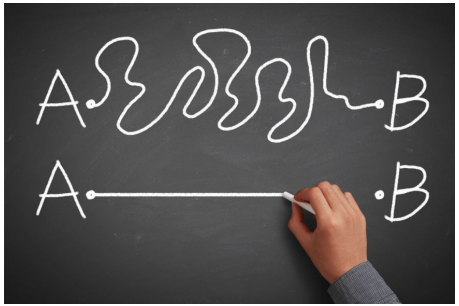
John P. Hussman, Ph.D
President, Hussman Strategic Advisors

INVESTORS MASTER CLASS MODULE #1

KEY TOPICS REVIEWED

- ***EVERY INVESTOR SHOULD BE AWARE THAT THEIR INVESTMENT DECISIONS HAVE BOTH A FINANCIAL AND EMOTIONAL CONSEQUENCE.***
- **Understanding your emotions and how they can be used to motivate you into action is extremely important.**
- **The INFLUENCING FACTORS in the markets will push and pull your emotions on a regular basis;**
- **The INFLUENCING FACTORS in the markets can and will influence your investment decisions overtime;**
- **EMOTIONS and INFLUENCING FACTORS have been proven to produce sub-par self directed investor performance – Dahlbar Study**
- **RETAIL TRADERS AND RECREATIONAL INVESTORS ALIKE MUST EMBRACE AND TRADE THE ACTUAL MARKET THEY ARE GIVEN, NOT THE MARKET THEY HOPED FOR OR THE ONE THEY BELIEVE THEY ARE ABOUT TO FIGURE OUT.**





INVESTORS MASTER CLASS MODULE #2

KEY TOPICS REVIEWED

MODULE #2 REVIEW

- We are looking to develop a BASELINE for our portfolios;
- Using some simple concepts we are looking to develop asset buckets based on investor age and risk tolerance;
- Based on the above buckets, we will be reviewing simple asset allocation strategies to aid in managing the assets in the portfolio;
- Following the above we will dive deeper into common Portfolio Metrics and Technicals to better understand common performance and management measures;



AS SELF-DIRECTED INVESTORS WE NEED TO CONSIDER THE FOLLOWING AS A PART OF OUR INVESTMENT PLANS;

- Investment Goals;
- Investor Age;
- Investor Risk Tolerance (Conservative, Moderate, Aggressive);
- Comfort level in managing your own investments;
- How much time do you have to manage your investments?;
- How much time do you want to be spending managing your investments?;
- Do you have to be invested in the markets at all times?
- Would a single asset allocation strategy suit your needs?
- Would a blend of two or more strategies suit your needs?







INVESTORS MASTER CLASS MODULE #3

KEY TOPICS REVIEWED

TODAY WE WILL BE DISCUSSING THE FOLLOWING;

- Technical Indicator Overview;
- Indicator Time Frames;
- The Indicators;
- Trend Following;
- Relative Strength;
- Market Breadth;
- Momentum;

- In Module #2, we introduced four basic strategies based on Strategic, Tactical and Dynamic Asset Allocation;

- Some of these strategies include Trend Following and Relative Strength Characteristics;

- In Module #4 – we will expand the above 4 strategies to 9 strategies;

- **TODAY WE WILL BE EXPLORING AN ADDITIONAL 5 STRATEGIES**

- **ALL THE STRAGIES PRESENTED IN THE CLASS CAN BE TRANSACTED IN BOTH US AND CANADIAN CURRENCIES;**

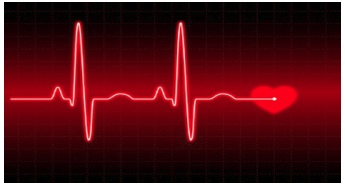
A CONCEPT TO BE THINKING ABOUT TODAY…

WHAT ROLE WILL TECHNINCAL ANALYSIS PLAY IN MY INVESTMENTS??











MISCELLANEOUS

CLASS BREAKS AND REST PERIODS

- We will be taking breaks during the class!
  - 1:00pm – 5min Break
  - 2:00pm – 5min Break
  - 3:00pm – 10min Break
  - 4:00pm – 5min Break
  - Questions and Answers – 30min

QUESTIONS AND ANSWERS

- We have ALOT of material to cover in the class!
- Please hold your questions until the end of the module;
- Please write down your questions when they arise throughout the class;
- We will be holding a 30min Question and Answer Period Following today's session;



TECHNICAL INDICATORS

- GENERAL OVERVIEW;
- WHY USE?;
- THINGS TO KEEP IN MIND;
- DEVELOPING A TOOLBOX;
- HOW MANY DO YOU NEED;

TECHNICAL INDICATORS

ULTIMATE GOAL

“IS MY TRUST IN MY TOOLS AND INDICATORS UN-WAIVERING SUCH THAT I CAN AND WILL CONFIDENTLY RISK MY CAPITAL BASED ON THEIR READINGS?”

-GATIS ROZE
TENSILE TRADING 2016

TECHNICAL INDICATORS
GENERAL OVERVIEW

WHAT IS A TECHNICAL INDICATOR?

- A Technical Indicator is a mathematical manipulation of price or volume data to produce a series of data points;
- Price data includes Open, High, Low, Close, Volume;
- The price or volume data is entered into a formula and a data point is produced;
- As only one data point does not offer much information, a period of time (look back period) is required to complete an analysis;
- The look back period is based on past data, not future;
- Technical indicators offer a different perspective to analyze price action;
- Simple example of 20,50- and 200-day Exponential Moving Averages, right;



TECHNICAL INDICATORS

WHY USE THEM?

Technical indicators can be used to **Alert**, **Confirm** and **Predict**;

- Technical indicators can be as an ***ALERT*** tool to provide an indication to look at price action more closely (i.e. MACD line/signal Cross);
- Technical indicators can be used to ***CONFIRM*** price movement. For example, an RSI oversold condition followed by a bounce off a support structure may provide confirmation on the direction of anticipated price action;
- Technical indicators can be used in some instances to ***PREDICT*** the direction of future prices.







TECHNICAL INDICATORS

THINGS TO KEEP IN MIND

THERE IS NO SUCH THING AS A PERFECT INDICATOR

- All technical indicators have advantages and disadvantages;
- A Technical Indicator is similar to a tool in a home builders tool box. Each tool has a different application to which it is used for;
- Technical indicators are meant to compliment price action, *NOT* replace it;

TECHNICAL INDICATORS FILTER PRICE ACTION

- Which means Technical indicators are derivatives of direct price action…

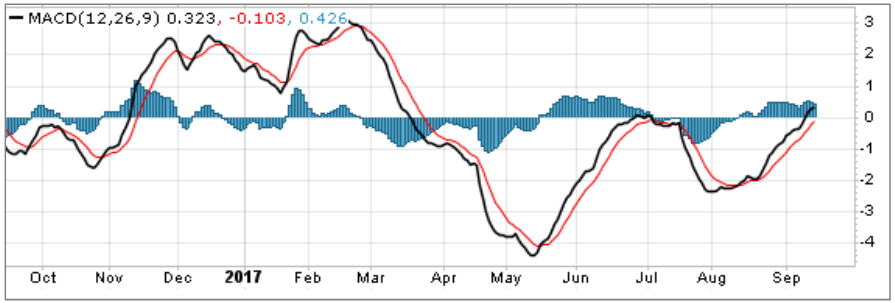
Example….the MACD Indicator consists of the following;

- 12-day EMA(fast moving average);
- 26-day EMA (slow moving average);
- MACD LINE = Difference of the 12- and 26-day EMA and;
- MACD Signal LINE = 9-day EMA of the MACD Line;
- MACD Histogram = MACD Line – MACD Signal;

THE MACD INDICATORS REQUIRES A TOTAL OF FIVE CALCULATIONS TO PRODUCE IT'S VALUES…WHICH MEANS IT'S FIVE TIMES REMOVED FROM THE DIRECT PRICE ACTION ON THE CHART!



IT IS VERY IMPORTANT TO UNDERSTAND HOW AND WHY TECHNICAL INDICATORS WORK THEY WAY THEY DO

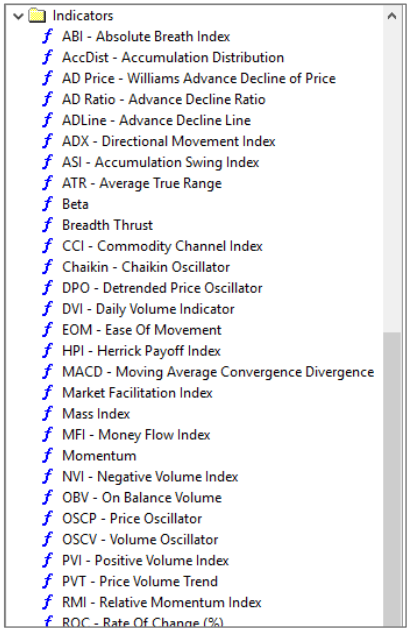


TECHNICAL INDICATORS
WE NEED TO DEVELOP A TOOLBOX

- There are 1000's of technical indicators available for investors and traders to use. Which ones to choose?
- We need to select a small basket of trusted indicators to form our technical tool box;
- Once we have selected our indicators we need to understand how they work and what signals they are giving us;

For more information on the Types of Technical Indicators, please see the link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:introduction_to_technical_indicators_and_oscillators





TECHNICAL INDICATORS

WHAT INDICATORS WILL YOU CHOOSE?

VOLUME BASED INDICATORS – 7 Shown



OSCILLATORS – 6 Shown



TREND FOLLOWING – 7 shown



GOLF CLUBS
HOW MANY DO YOU REALLY NEED?

According to the USGA, a golfer is allowed to have 14 clubs in his/her bag. A golfer's bag would typically consist of the following;

1. Driver
2. 3 wood
3. 5 wood/hybrid
4. 3 iron/ hybrid
5. 4 iron/ hybrid
6. 5 iron/ hybrid
7. 6 iron
8. 7 iron
9. 8 iron
10. 9 iron
11. Pitching Wedge iron
12. Sand Wedge
13. Lob Wedge
14. Putter



GOLF CLUBS

A TK TRUE STORY

A HUMBLING 18-HOLE ROUND WITH A GUEST OF MY PREVIOUS GOLF CLUB

HOLE	1	2	3	4	5	6	7	8	9	OUT	10	11	12	13	14	15	16	17	18	IN	TOTAL
Gold	362	405	164	358	480	424	180	382	347	**3102**	494	380	137	440	403	401	227	562	485	**3529**	**6631**
Navy	346	397	150	353	460	412	166	364	332	**2980**	491	373	125	433	380	365	190	555	462	**3374**	**6354**
Navy/Silver	346	392	150	353	460	292	166	364	332	**2855**	401	373	125	325	349	365	157	471	462	**3028**	**5883**
Silver	335	392	148	315	390	292	162	320	317	**2671**	401	326	105	325	349	326	157	471	398	**2858**	**5529**
Silver/Green	335	310	148	232	390	292	80	320	317	**2424**	401	250	105	325	304	326	157	396	312	**2576**	**5000**
Green	288	310	78	232	308	292	80	281	251	**2120**	345	250	30	325	304	265	97	396	312	**2324**	**4444**
PAR	4	4/5	3	4	5	4	3	4	4	**35, 36**	5	4	3	4	4	4	3	5	5	**37**	**72, 73**

- Par on this golf course is 72. We played 6631 yards (although not long, the course is quite challenging…Slope Rating =139);
- Tim's 18-hole score = 74 or two over par (respectable);
- Guest's Score = 68 or 5-under par (the only way I can describe this score is AMAZING)……**HE ONLY USED FIVE CLUBS**…..

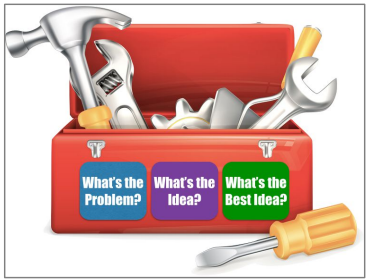
GOLF CLUBS
HOW MANY DO YOU REALLY NEED?

THE BIG TAKEAWAY…

- You don't need many golf clubs to produce an excellent round of golf;
- You don't need many technical indicators to produce satisfying gains in the market;
- **YOU DO NEED TO KNOW HOW YOUR CLUBS/INDICATORS WORK TO BE ABLE TO EXTRACT THEIR TRUE POWER.**







TIM'S RECOMMENDATIONS…IF FIVE GOLF CLUBS CAN POST A 68 ON THE GOLF COURSE….FIVE INDICATORS CAN DO JUST FINE IN THE MARKET!!

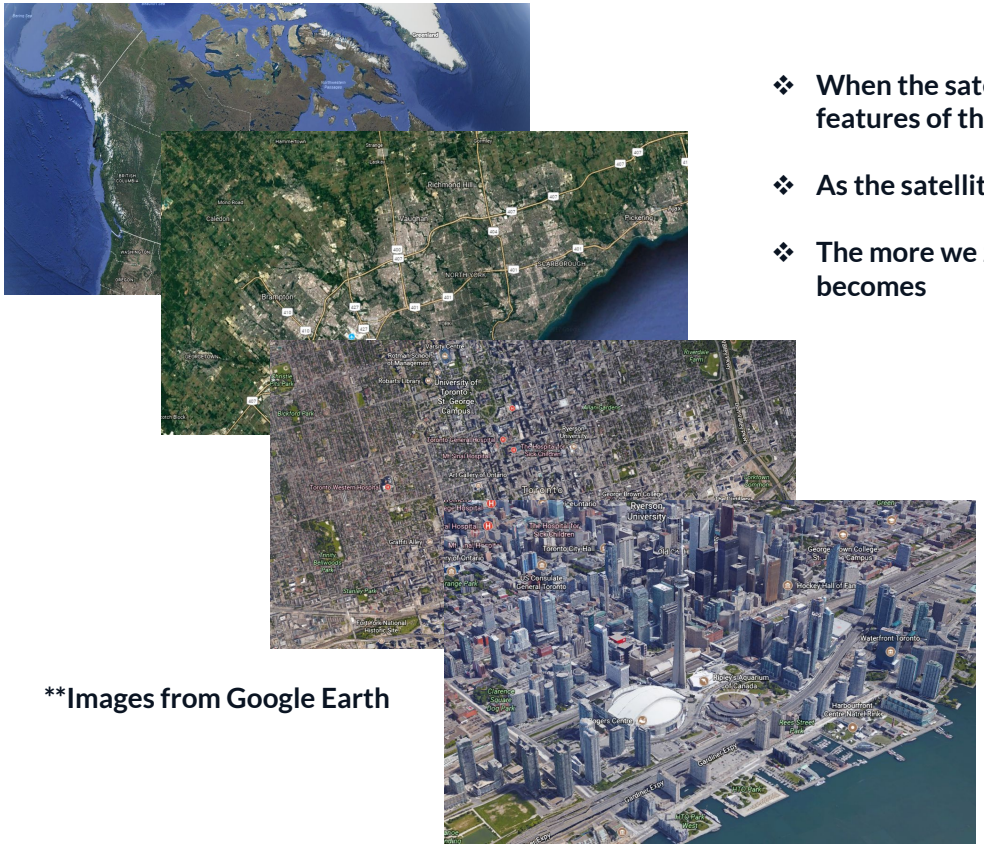


INDICATOR TIMEFRAMES

- THE ZOOM LENS;
- WHY USE?;
- WHAT TIMEFRAME IS RIGHT FOR YOU?;
- EXAMINING TIMEFRAMES;
- SHORT TERM VS LONG TERM;

INDICATOR TIMEFRAMES

THE "ZOOM LENS"



**Images from Google Earth

- When the satellite is zoomed out, there are few noticeable distinct features of the earth.
- As the satellite starts to zoom in, the level of viewing detail increases.
- The more we zoom in, the more detail emerges and the faster the world becomes

- Think of this in terms of trading various time frames.
- Are you a day trader using 5min charts for an example? Are you a swing trader using daily charts? or longer-term investor using weekly charts as an example?

THE TIME FRAME THAT YOU USE TO INVEST/ TRADE WITH IS A PERSONAL CHOICE. IT CAN BE DIFFERENT FROM PERSON TO PERSON. HOWEVER REGARDLESS OF YOUR INDIVIDUAL INVESTMENT/ TRADING STYLE IT IS ALWAYS IMPORTANT TO BE AWARE OF YOUR SURROUNDINGS.

INDICATOR TIMEFRAMES
INVESTOR PERCEPTION

YOUR TIMEFRAME OF ANALYSIS CAN AND WILL IMPACT YOUR TRADING AND INVESTMENT DECISIONS

- As self-directed investors and traders, each of us has an individual view of the markets and trading style based on needs, risk appetite, interest in the markets, etc;
- How you perceive the facts on the charts ultimately determines your individual trading style and decision-making process;
- Your investing/trading time frame will determine your trading involvement. Your time frame in which to trade is a critical factor in your trading plan;
- For example, if you are a day trader, you may be determining and assessing trends, trend lines and indicators looking at 5min price charts;
- If you are a swing /position trader, perhaps, you may use daily price charts;
- If you are a longer-term investor, you may use weekly or even monthly charts;

TIMEFRAMES WILL IMPACT YOUR EMOTIONS

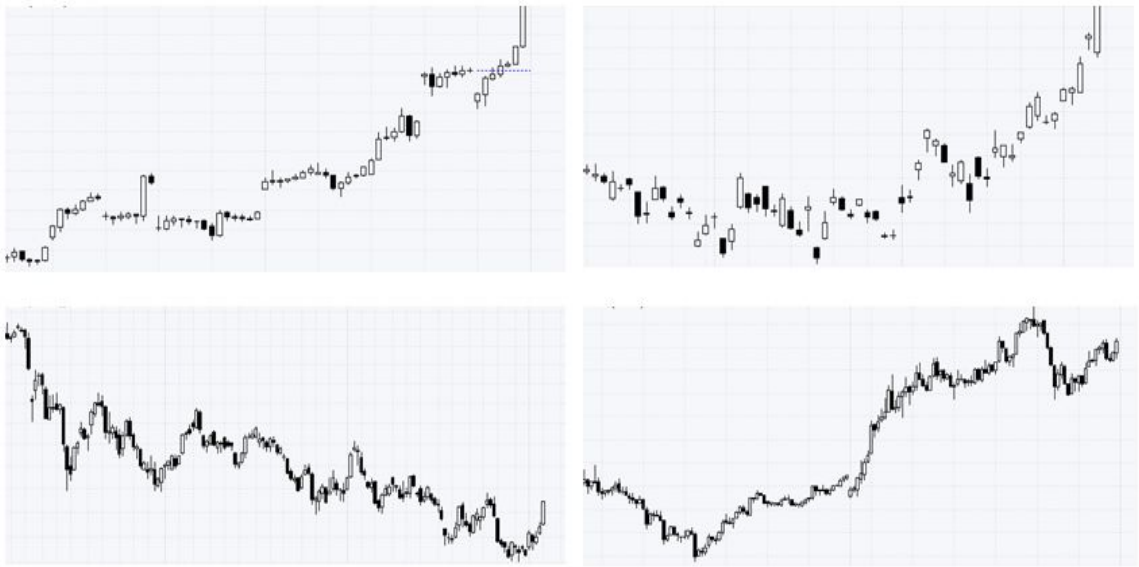


INDICATOR TIMEFRAMES

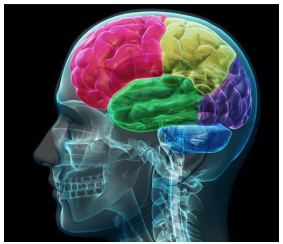
WHAT TIME FRAME IS RIGHT FOR YOU?

Enclosed are four charts (right) for consideration. Please note the following has have not been enclosed on the charts;

- ticker symbol;
- time scale;
- current price;
- Volume;
- chart indicators and overlays;



WHAT CHART LOOKS MOST APPEALING TO YOU?



TIMEFRAMES WILL CREATE BIAS'S

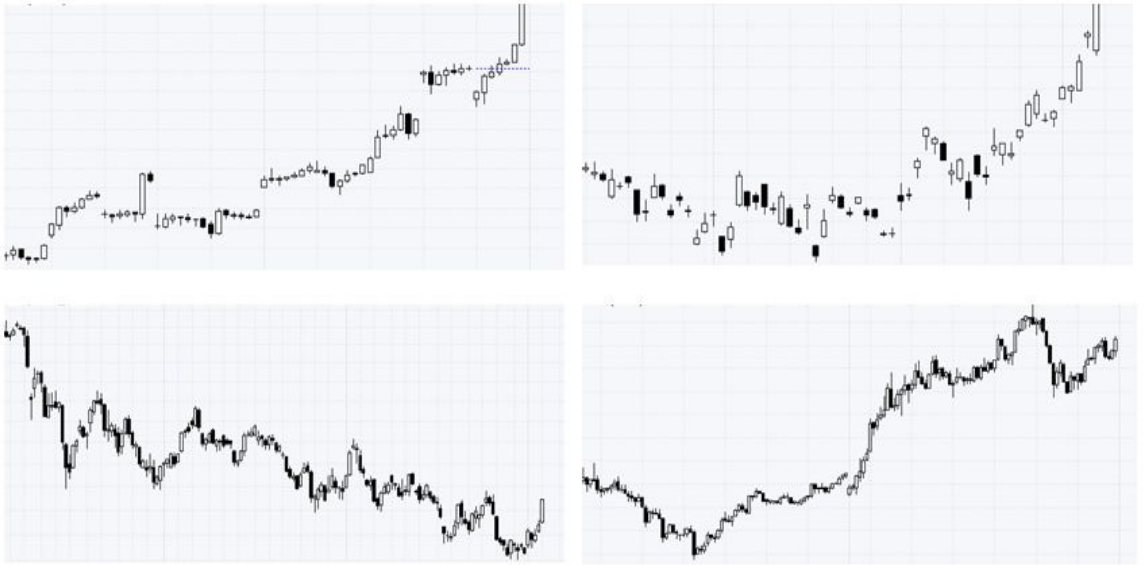
INDICATOR TIMEFRAMES

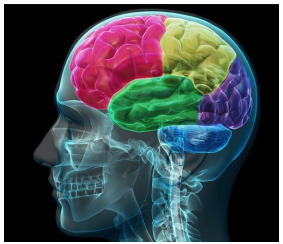
5MIN, HOURLY, DAILY, WEEKLY

CASE STUDY SPDR GOLD TRUST SHARES ETF (GLD)

The four charts a(right) are of GLD up to and including February 5th, 2016. Below is a description of each chart;

- The ***TOP LEFT*** chart is an ***HOURLY*** chart of GLD, showing price action from February 2 to February 10, 2016
- The ***TOP RIGHT*** chart is a **DAILY** chart of GLD, showing price action from the end of October 2015 – February 10, 2016
- The ***BOTTOM LEFT*** chart is a **WEEKLY** chart of GLD, showing price action from September 2012 to February 10, 2016
- The ***BOTTOM RIGHT*** is a ***5 min CHART*** of GLD, showing price action from February 8 to February 10, 2016.





TIMEFRAMES WILL IMPACT THE PERFORMANCE OF YOUR INVESTMENTS

INDICATOR TIMEFRAMES

BE AWARE OF YOUR SURROUNDINGS



GLD Daily Chart (December 8, 2015 – February 5, 2015)

The daily chart above shows GLD finding support at $105.50. The yellow metal rose there and appreciated 12% from the December 17, 2016 low to the close on Friday February 5, 2016. This 12% appreciation was over 33 days of trade.

GLD Weekly Chart (February 2013 – February 2016)

The weekly chart of GLD shows a 35% price decline since its record highs in September of 2011.



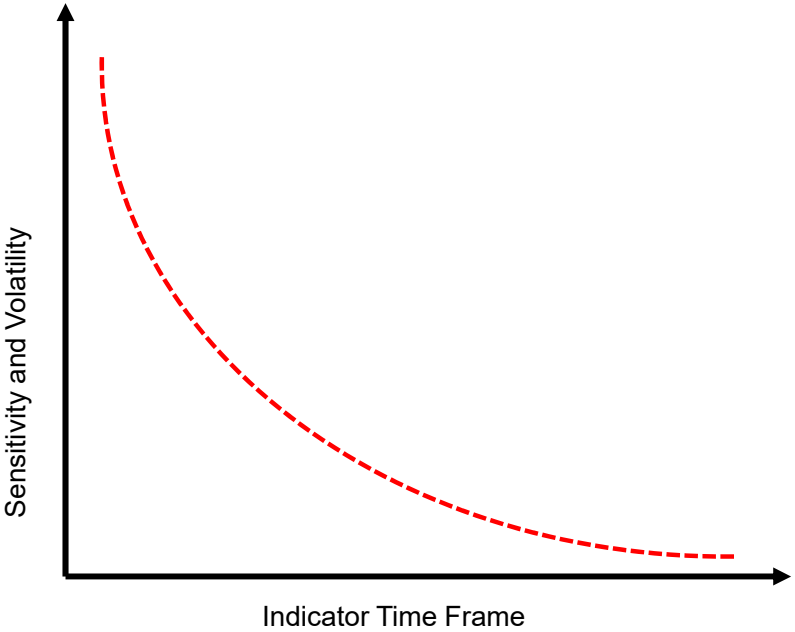
MARKETS EXIST ON DIFFERENT TIME FRAMES. DEPENDING ON HOW MUCH YOU WANT TO "ZOOM IN" ON THE MARKETS, THE FASTER MOVING THEY BECOME. THE FASTER THE TIME FRAME, THE MORE ATTENTIVE YOU NEED TO BE TO MAKE DECISIONS.

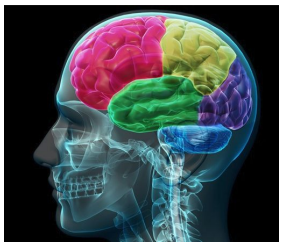
INDICATOR TIMEFRAMES

SHORT TERM VS LONG TERM

- Shorter indicator timeframes react sooner to variations in price movements. As theses shorter term timeframes react quickly, there tend to be more signals and the signals are quite volatile.

- Longer indicator timeframes react slower to variations in price movements. Longer term timeframes lag price action. There tend to be less signals than shorter term time frames. Longer term timeframes are subject to increased price variability.



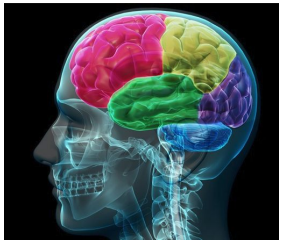


FOR TECHNICAL INDICATORS, THERE IS A TRADE-OFF BETWEEN SENSITIVITY AND CONSISTENCY. IT IS UP TO EACH INVESTOR TO SELECT A TIMEFRAME THAT SUITS HIS OR HER TRADING STYLE AND OBJECTIVES.

INDICATOR TIMEFRAMES

SUMMARY

- Knowing that the market exists on various time frames are you swimming against the current? Or swimming with the current? Would you have held GLD from September 2011 to Feb 5, 2016?
- Using a weekly or monthly chart to start your analysis will greatly broaden your perspective. The broader perspective may help you make strategic decisions on when to add to or remove portions of your positions from the trade.
- The time frame to which you trade should be an important part of your Investment Plan.
- We can use the time frames to establish longer term trends (bullish or bearish) as well as shorter term counter trend bounces.



KNOW THAT TIMEFRAMES WILL IMPACT HOW YOU PERCEIVE THE MARKET



THE INDICATORS

- MOVING AVERAGES;
- PERCENT PRICE OSCILLATOR (PPO);
- STOCHASTICS;
- BOLLINGER BANDS;
- RATE OF CHANGE;

TECHNICAL INDICATORS

VOLUME, OSCILLATORS, TREND FOLLOWING

VOLUME BASED INDICATORS – 7 Shown



OSCILLATORS – 6 Shown



TREND FOLLOWING – 7 shown



TECHNICAL INDICATORS
MOVING AVERAGES

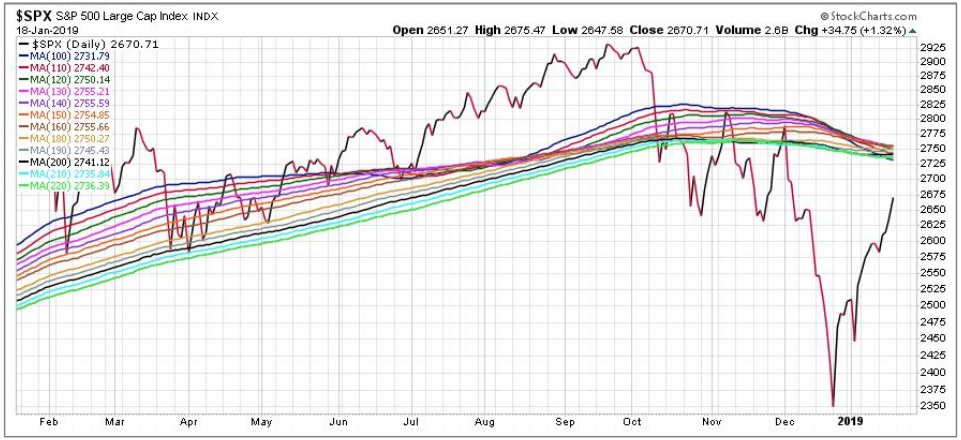
MOVING AVERAGES

- The two most popular types of moving averages are the Simple Moving Average (SMA) and the Exponential Moving Average (EMA).
- These moving averages can be used to identify the direction of the trend or define potential support and resistance levels.

For more information on Moving Averages, see the following link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:moving_averages





SAMPLE SIMPLE MOVING AVERAGE CALCULATION

- Daily Closing Prices: 11,12,13,14,15,16,17
- First day of 5-day SMA: (11 + 12 + 13 + 14 + 15) / 5 = 13
- Second day of 5-day SMA: (12 + 13 + 14 + 15 + 16) / 5 = 14
- Third day of 5-day SMA: (13 + 14 + 15 + 16 + 17) / 5 = 15

TECHNICAL INDICATORS

MOVING AVERAGES AND BANDS

MOVING AVERAGES



Simple (SMA) and Exponential (EMA)

KELTNER CHANNELS



MA BANDS



BOLLINGER BANDS



PRICE CHANNELS



TECHNICAL INDICATORS
PERCENT PRICE OSCILLATOR (PPO)

PERCENTAGE PRICE OSCILLATOR (PPO)

- The Percentage Price Oscillator (PPO) is a momentum oscillator that measures the difference between two moving averages as a percentage of the larger moving average.
- The PPO is similar to the Moving Average Convergence Divergence (MACD) indicator in that the PPO is shown with the indicator line, signal line and histogram.
- Both the MACD and the PPO calculate a distance between a fast and slow exponential moving average.
- A signal line is produced by generating an exponential moving average of the difference between the fast- and slow-moving averages.
- The histogram is used to illustrate the change in momentum between the indicator line and the signal line.
- Standard settings for the PPO are (12,26,9). The standard settings can be adjusted to suit any timeframe of preference.

For more information on Percentage Price Oscillator (PPO), see the following link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:price_oscillators_ppo



TECHNICAL INDICATORS
PERCENT PRICE OSCILLATOR (PPO)

PERCENTAGE PRICE OSCILLATOR (PPO)

- From a visual standpoint, both indicators appear to be similar. So similar in fact, the math involved in the calculation of each indicator is almost identical.

- The formulas for the PPO and the MACD with the standard (12,26,9) settings for comparison have been illustrated below;

$$\text{MACD(line)} = \text{12day EMA} - \text{26day EMA}$$

$$\text{PPO}(line) = \left(\frac{\text{12 day EMA} - \text{26 day EMA}}{\text{26 day } EMA}\right) \times 100$$

- Signal Line: 9-day EMA of PPO/MACD Line

- PPO/MACD Histogram = PPO/MACD Line – Signal Line

THE MACD CALCULATES ITS VALUES ON AN ABSOLUTE BASIS. THIS MEANS THAT THE MACD VALUES ARE CALCULATED BASED ON A DOLLAR VALUE AND SPECIFIC TO ONLY TO THE ASSET TO WHICH IT IS APPLIED

THE PPO CALCULATES ITS VALUES BASED ON A PERCENTAGE OR RELATIVE BASIS. THIS MEANS THAT PPO READING FROM ONE ASSET CAN BE COMPARED TO ANOTHER. THE RELATIVE NATURE OF THE PPO ENABLES THE INDICATOR TO BE USED IN SCANNING AND RELATIVE STRENGTH ANALYSIS.



TECHNICAL INDICATORS
RATE OF CHANGE (ROC)

RATE OF CHANGE (ROC)

- The purest form of momentum is measured by the Rate of Change (ROC) indicator. The ROC indicator calculates the difference between two prices over a fixed time interval. The Rate of Change indicator is defined within Amibroker as the following;

ROC = 100*(array - ref(array, -periods))/abs(ref(array, -periods))

Where;

- Array = open, high, low, close, volume. For our examples we will use closing prices in the ROC calculations.

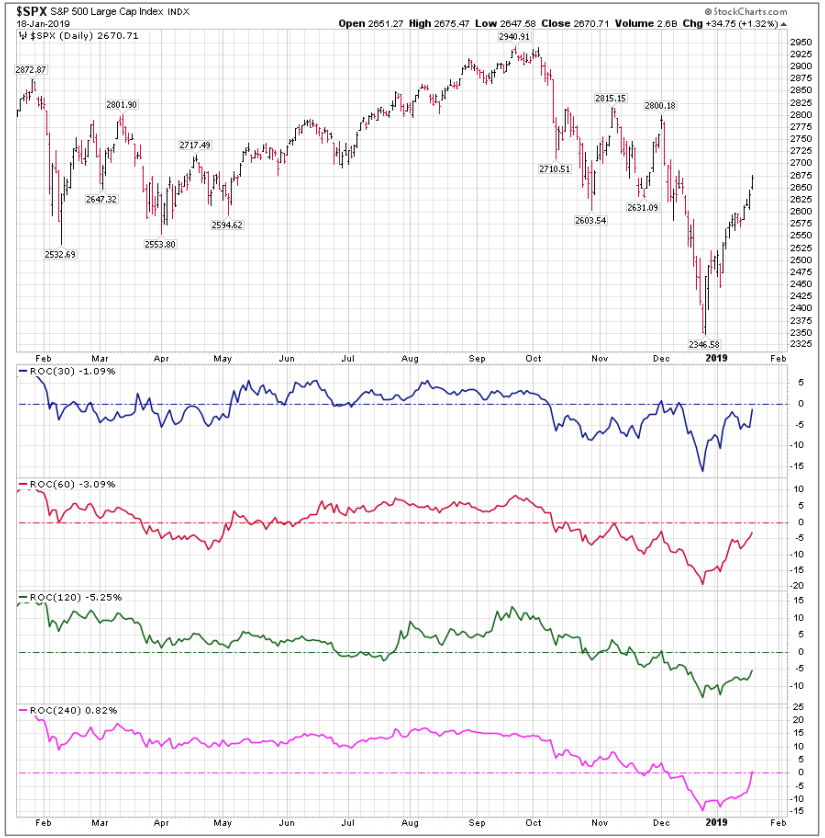
- periods = Time interval of interest or look back period

The formula *ROC(CLOSE, 14)* returns the 14-period percent rate of change of the closing prices.

For more information on Rate of Change, see the following link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:rate_of_change_roc_and_momentum

THE ROC CALCULATES ITS VALUES BASED ON A PERCENTAGE OR RELATIVE BASIS. THIS MEANS THAT ROC READING FROM ONE ASSET CAN BE COMPARED TO ANOTHER. THE RELATIVE NATURE OF THE ROC ENABLES THE INDICATOR TO BE USED IN SCANNING AND RELATIVE STRENGTH ANALYSIS.



TECHNICAL INDICATORS
BOLLINGER BANDS

BOLLINGER BANDS

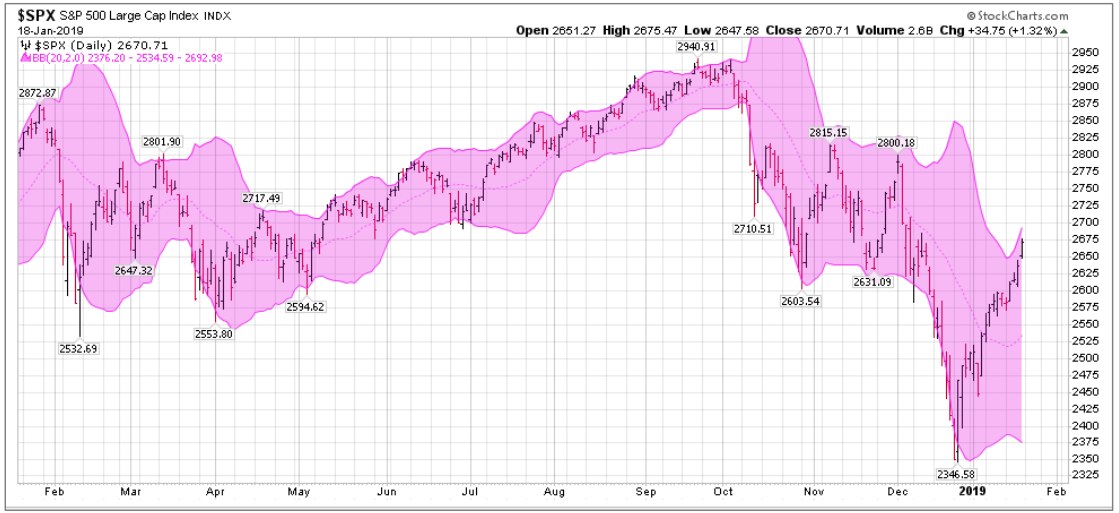
- Developed by John Bollinger, Bollinger Bands® are volatility bands placed above and below a moving average.
- Volatility is based on the standard deviation, which changes as volatility increases and decreases.
- The bands automatically widen when volatility increases and narrow when volatility decreases.
- This dynamic nature of Bollinger Bands also means they can be used on different securities with the standard settings.

Note: Bollinger Bands® is a registered trademark of John Bollinger.

The formula *BB(20,2.0)* returns the an upper (+2 Std Deviations)and lower band (-2std deviations) around the 20day Simple Moving Average.

For more information on Bollinger Bands, see the following link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:bollinger_bands



SAMPLE BOLLINGER BAND CALCULATION

- Middle Band = 20-day simple moving average (SMA)
- Upper Band = 20-day SMA + (20-day standard deviation of price x 2)
- Lower Band = 20-day SMA - (20-day standard deviation of price x 2)

TECHNICAL INDICATORS
STOCHASTIC OSCILLATOR

STOCHASTIC OSCILLATOR

- Developed by George C. Lane in the late 1950s, the Stochastic Oscillator is a momentum indicator that shows the location of the close relative to the high-low range over a set number of periods.

- According to an interview with Lane, the Stochastic Oscillator "doesn't follow price, it doesn't follow volume or anything like that. It follows the speed or the momentum of price. As a rule, the momentum changes direction before price."

The Stochastic Oscillator is a range bound oscillator ranging from 0 to 100. The formula *Full STO (14,3)* returns the location of current price action, as a percentage within it's 14-day range. A value of 0 would indicate price is located at the bottom of the range. A value of 100 would indicate price is located at the top of the range.

For more information on the Stochastic Oscillator, see the following link below;

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:stochastic_oscillator_fast_slow_and_full



SAMPLE STOCHASTIC OSCILLATOR CALCULATION

- %K = (Current Close - Lowest Low)/(Highest High - Lowest Low) * 100
- %D = 3-day SMA of %K

- Lowest Low = lowest low for the look-back period
- Highest High = highest high for the look-back period
- %K is multiplied by 100 to move the decimal point two places

IT'S TIME….

IT'S TIME TO





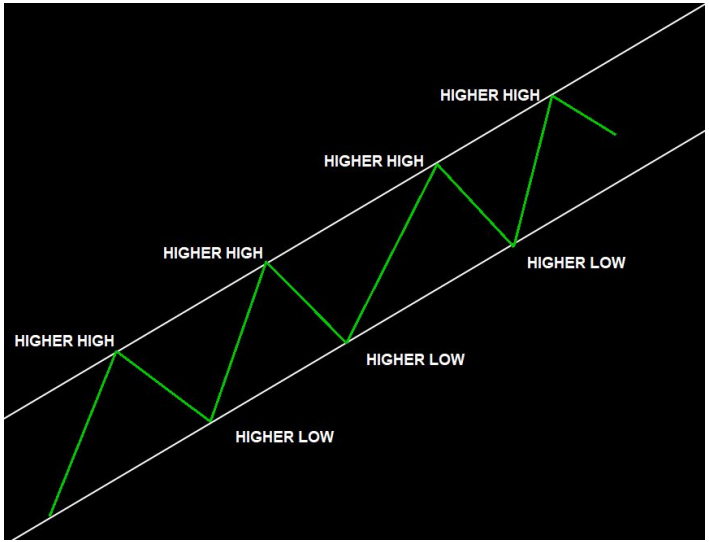
TREND FOLLOWING

- CHARACTERISTICS OF A TREND;
- DO MARKETS TREND? ANALYSING THE FACTS;
- THE VISUAL TREND FOLLOWER;
- TREND FOLLOWING BIASES;
- PUTTING THE INDICATORS TO WORK;
- REFERENCES;

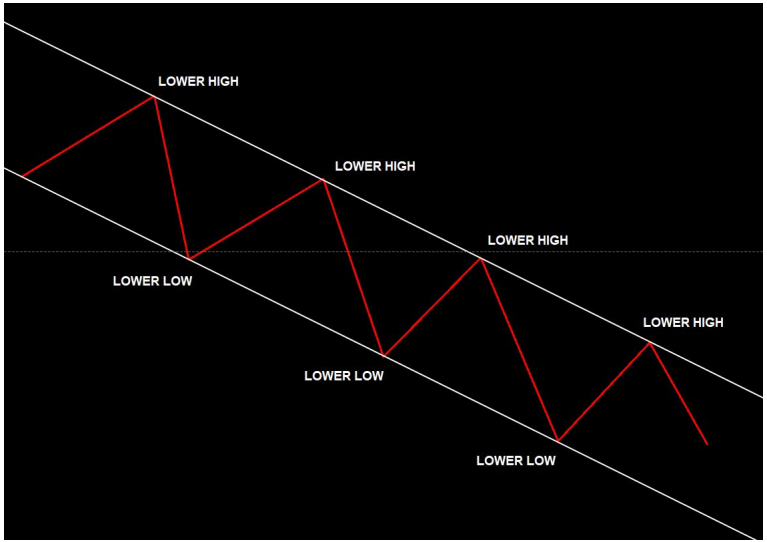
CHARACTERISTICS OF A TREND

UPTRENDS AND DOWNTRENDS

UPTREND formations are generally characterised by a series of higher highs and higher lows.



DOWNTREND formations are generally characterised by a series of lower highs and lower lows.



MARKETS DON'T TREND….

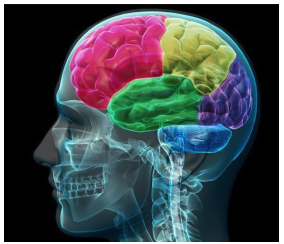
WE HAVE HEARD THIS BEFORE. IS IT TRUE?



WE HAVE ALSO HEARD

- Trend Following doesn't make money;
- Trend Following will not protect capital;
- Markets are efficient;

Let's see where the TRUTH really lies!



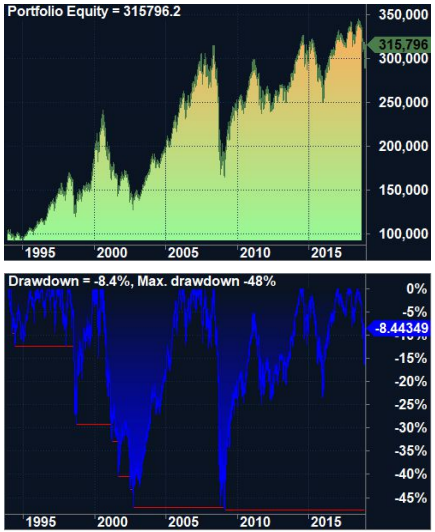
BUY AND HOLD VS TREND FOLLOWING

TSX HISTORICAL PERFORMANCE

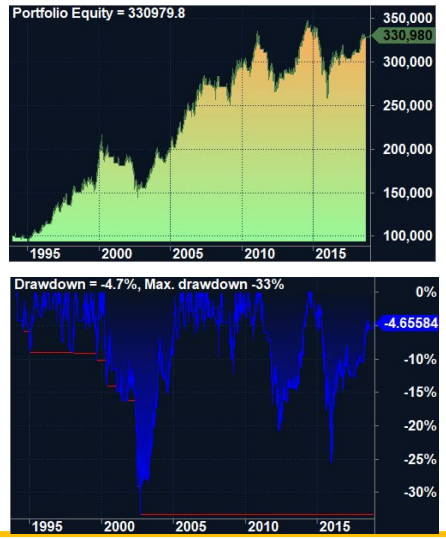
BACKTEST METRICS

- Ticker symbol: Toronto Stock Exchange ($TSX) (un-adjusted)
- Test period: January 1, 1994 to Jan 16, 2019
- Buy price = Close
- Sell price = Close
- Initial equity = $100,000
- Commissions and slippage have not been included

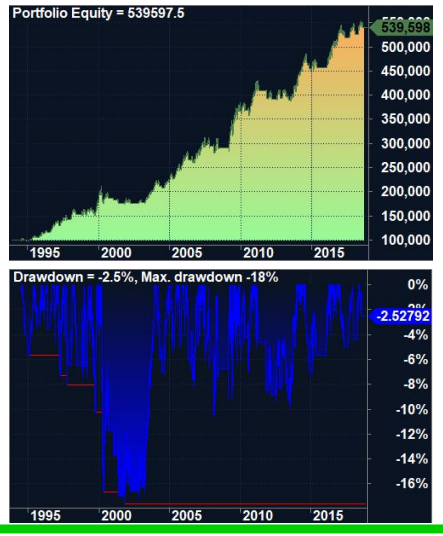
BUY AND HOLD
CAGR = 4.70%
Max DD = -49.99%



BUY > 65day MA – Sell < 65day MA
CAGR = 4.89%
Max DD = -33.28%



BUY 10 day EMA > 60day EMA
SELL – 10 day EMA < 60day EMA
CAGR = 6.96%
Max DD = -17.60%



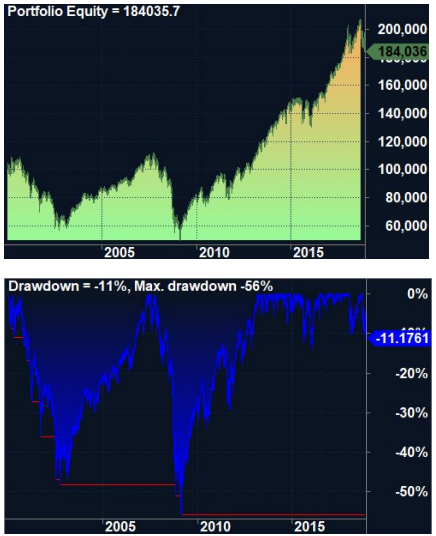
BUY AND HOLD VS TREND FOLLOWING

S&P 500 HISTORICAL PERFORMANCE

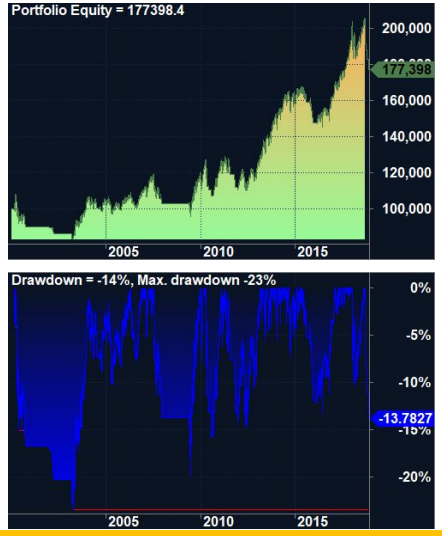
BACKTEST METRICS

- ❖ Ticker symbol: S&P 500 Large Cap Index ($SPX) (un-adjusted)
- ❖ Test period: January 4, 2000 to December 14, 2018
- ❖ Buy price = Close
- ❖ Sell price = Open
- ❖ Initial equity = $100,000
- ❖ Commissions and slippage have not been included

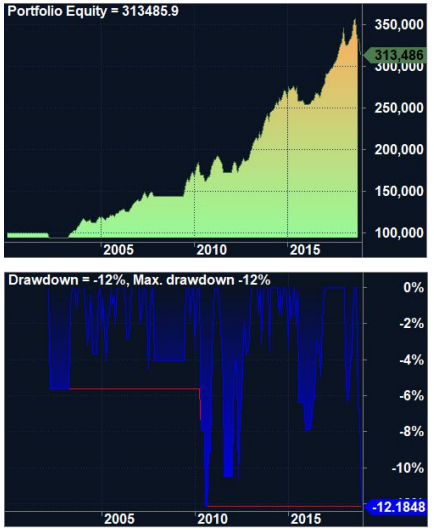
BUY AND HOLD
CAGR = 3.27%
Max DD = 56.78%



BUY > 200day MA – Sell < 200day MA
CAGR = 3.07%
Max DD = 23%



BUY > 10 Month MA – Sell < 10 Month MA
CAGR = 6.24%
Max DD = 12.18%



DO MARKETS REALLY TREND??

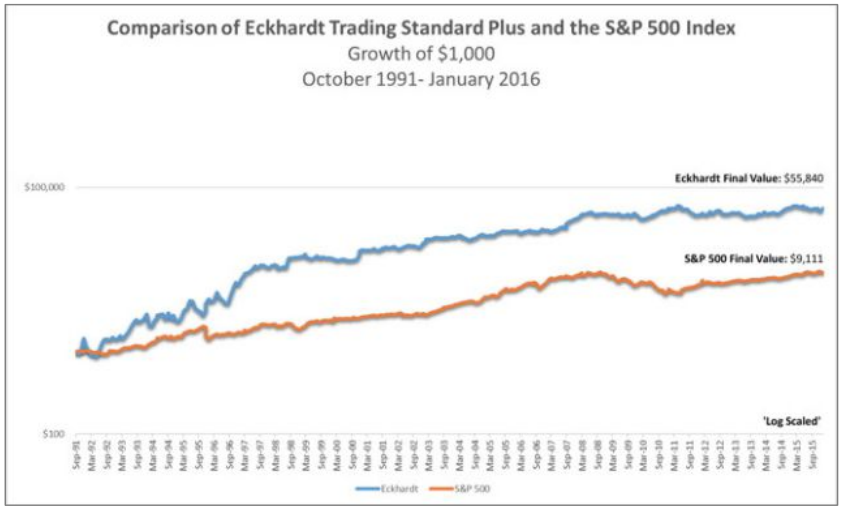
YOU BET THEY DO!

" Trend following is *counterintuitive*. It goes against typical investment orthodoxy.

Trend following is not Warren Buffett, algo whatever, prediction, forecasting, buy and hold, fundamental analysis, value investing, day trading, HFT, Elliott Wave, candlestick patterns or traditional technical analysis of stock analysis like charting.

Trend following is something *different*. Very different."- Michael Covel

https://www.trendfollowing.com/resources/



A Century of Evidence on Trend-Following Investing

26 Pages • Posted: 28 Jun 2017

Brian Hurst
AQR Capital Management, LLC

Yao Hua Ooi
AQR Capital Management, LLC

Lasse Heje Pedersen
AQR Capital Management, LLC; Copenhagen Business School - Department of Finance; New York University (NYU); Centre for Economic Policy Research (CEPR)

Date Written: June 27, 2017

Abstract

In this article, the authors study the performance of trend-following investing across global markets since 1880, extending the existing evidence by more than 100 years using a novel data set. They find that in each decade since 1880, time series momentum has delivered positive average returns with low correlations to traditional asset classes. Further, time-series momentum has performed well in 8 out of 10 of the largest crisis periods over the century, defined as the largest drawdowns for a 60/40 stock/bond portfolio. Lastly, time series momentum has performed well across different macro environments, including recessions and booms, war and peacetime, high- and low-interest rate regimes, and high- and low-inflation periods.

Keywords: trend-following, time series momentum, managed futures, CTA, hedge funds, alternative investments

JEL Classification: G02, G11, G12, G13, G14, G23

Suggested Citation:

Hurst, Brian and Ooi, Yao Hua and Pedersen, Lasse Heje, A Century of Evidence on Trend-Following Investing (June 27, 2017). Available at SSRN: https://ssrn.com/abstract=2993026 or http://dx.doi.org/10.2139/ssrn.2993026

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2993026

TREND DIRECTION IDENTIFICATION

THE VISUAL TREND FOLLOWER

CHART A – WHAT DIRECTION IS THE TREND?

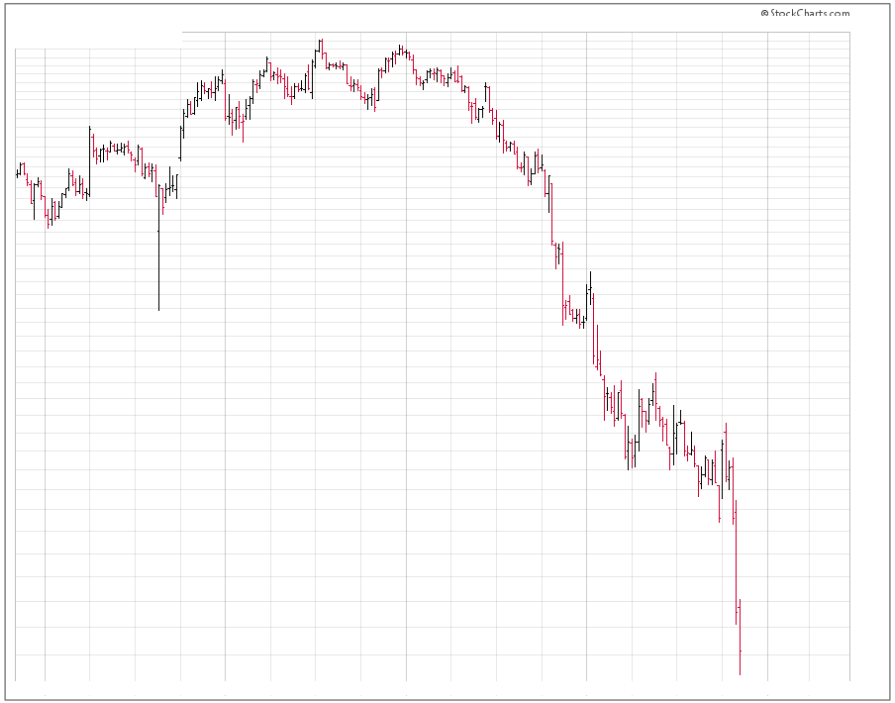
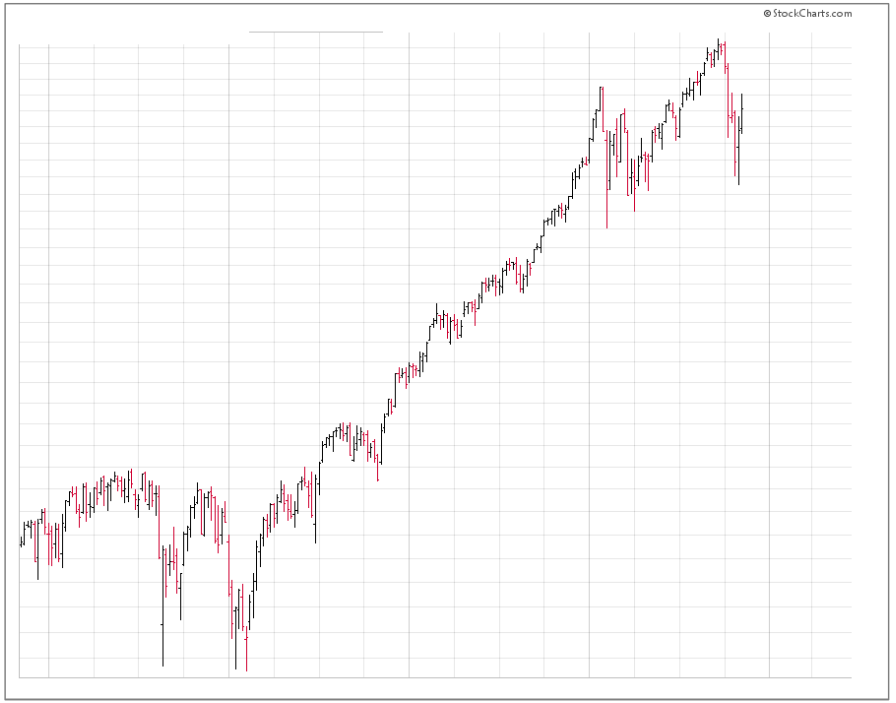


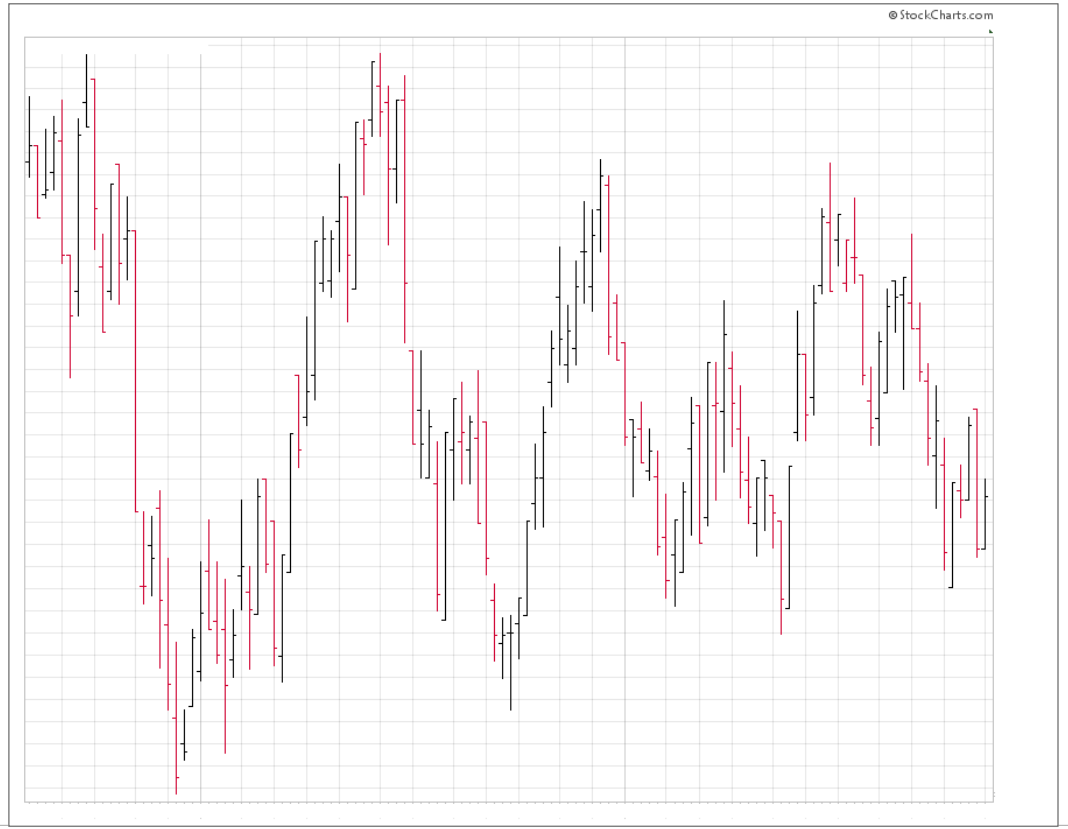
CHART B – WHAT DIRECTION IS THE TREND?



TREND DIRECTION IDENTIFICATION

THE VISUAL TREND FOLLOWER

CHART C – WHAT DIRECTION IS THE TREND?



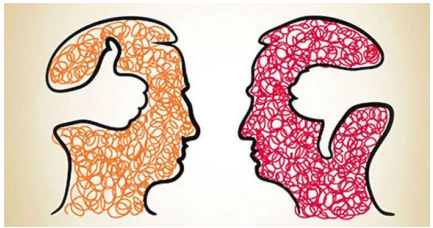
TREND DIRECTION IDENTIFICATION

THE VISUAL TREND FOLLOWER

BATTLING BIASES IS ARGUABLY THE SINGLE MOST CHALLENGING ASPECT OF TECHNICAL ANALYSIS.

We are all pervious to a number of various opinions in the markets from various experts and news sources. These various opinions and views have the ability to influence our views when we look at price charts. There are three possible outcomes when we look at a price chart;

- We see what we want to see;
- We see what we think we see or;
- We see what is actually there.



If you are BULLISH on the markets, more often than not, you'll see a bullish chart.

If you are BEARISH on the markets, more often than not, you'll see a bearish chart.

We need a methodology to remove any biases we may have.

We've all heard the saying "The market can stay irrational longer than we can stay solvent".

TREND DIRECTION IDENTIFICATION

REMOVING BIASES

WE CAN HELP REMOVE BIASES USING TECHNICAL INDICATORS….

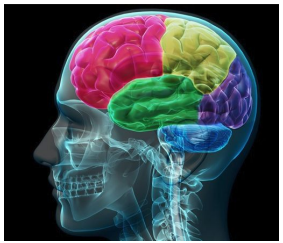


TREND DIRECTION IDENTIFICATION

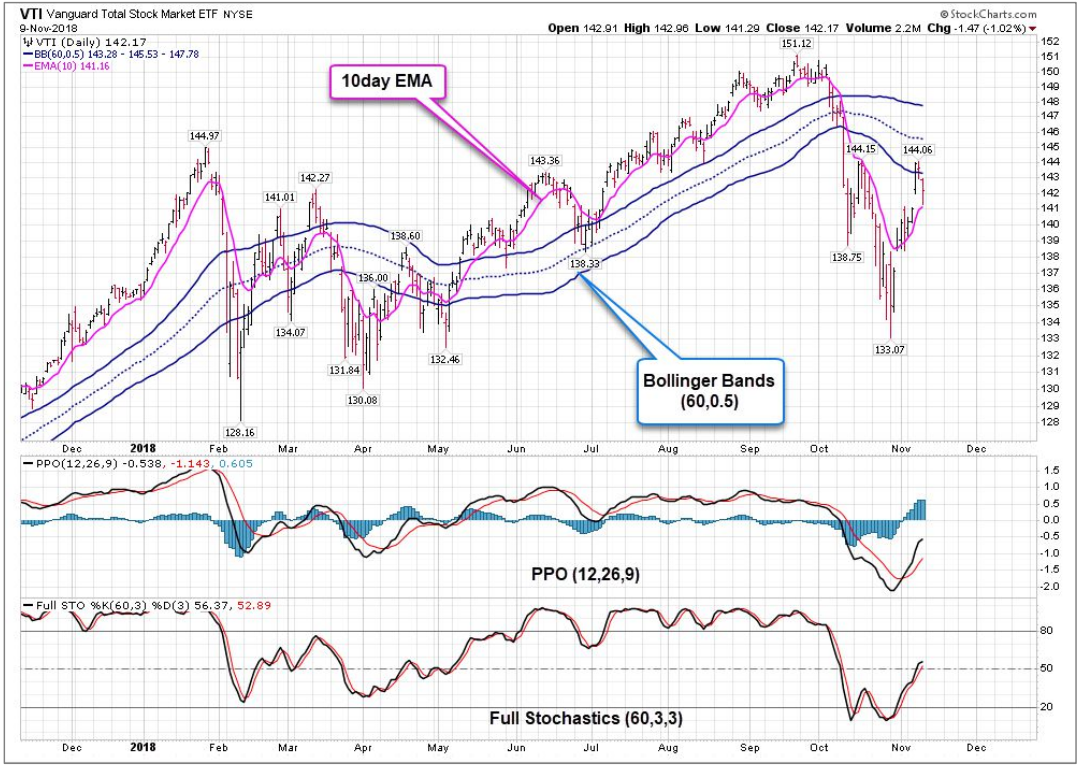
PUTTING THE INDICATORS TO WORK

TREND FOLLOWING TECHNICAL INDICATORS DISCUSSED

- Percent Price Oscillator (PPO);
- Bollinger Bands;
- Stochastics;





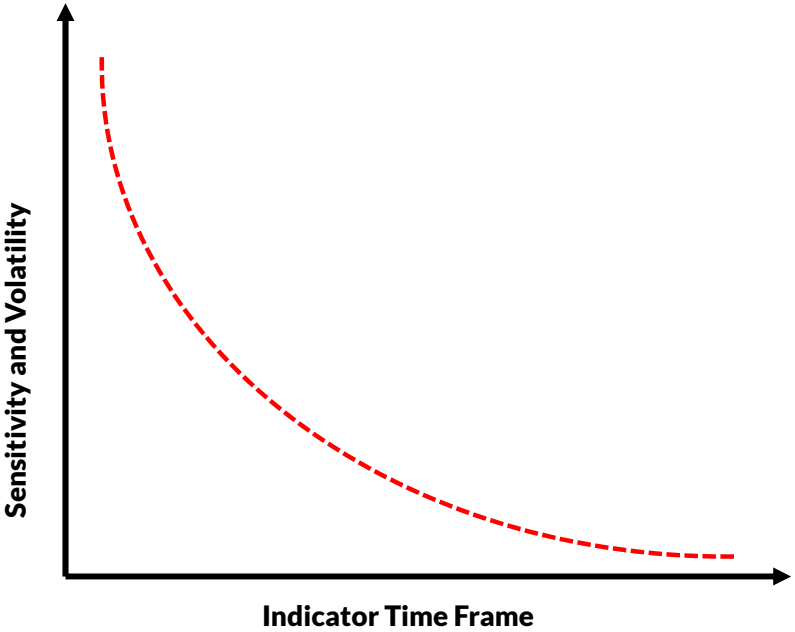


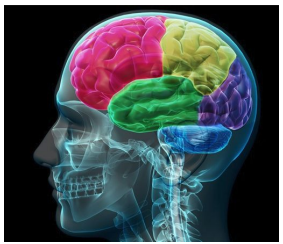
INDICATOR TIMEFRAMES

SHORT TERM VS LONG TERM

- Shorter indicator timeframes react sooner to variations in price movements. As theses shorter term timeframes react quickly, there tend to be more signals and the signals are quite volatile.

- Longer indicator timeframes react slower to variations in price movements. Longer term timeframes lag price action. There tend to be less signals than shorter term time frames. Longer term timeframes are subject to increased price variability.





FOR TECHNICAL INDICATORS, THERE IS A TRADE-OFF BETWEEN SENSITIVITY AND CONSISTENCY. IT IS UP TO EACH INVESTOR TO SELECT A TIMEFRAME THAT SUITS HIS OR HER TRADING STYLE AND OBJECTIVES.

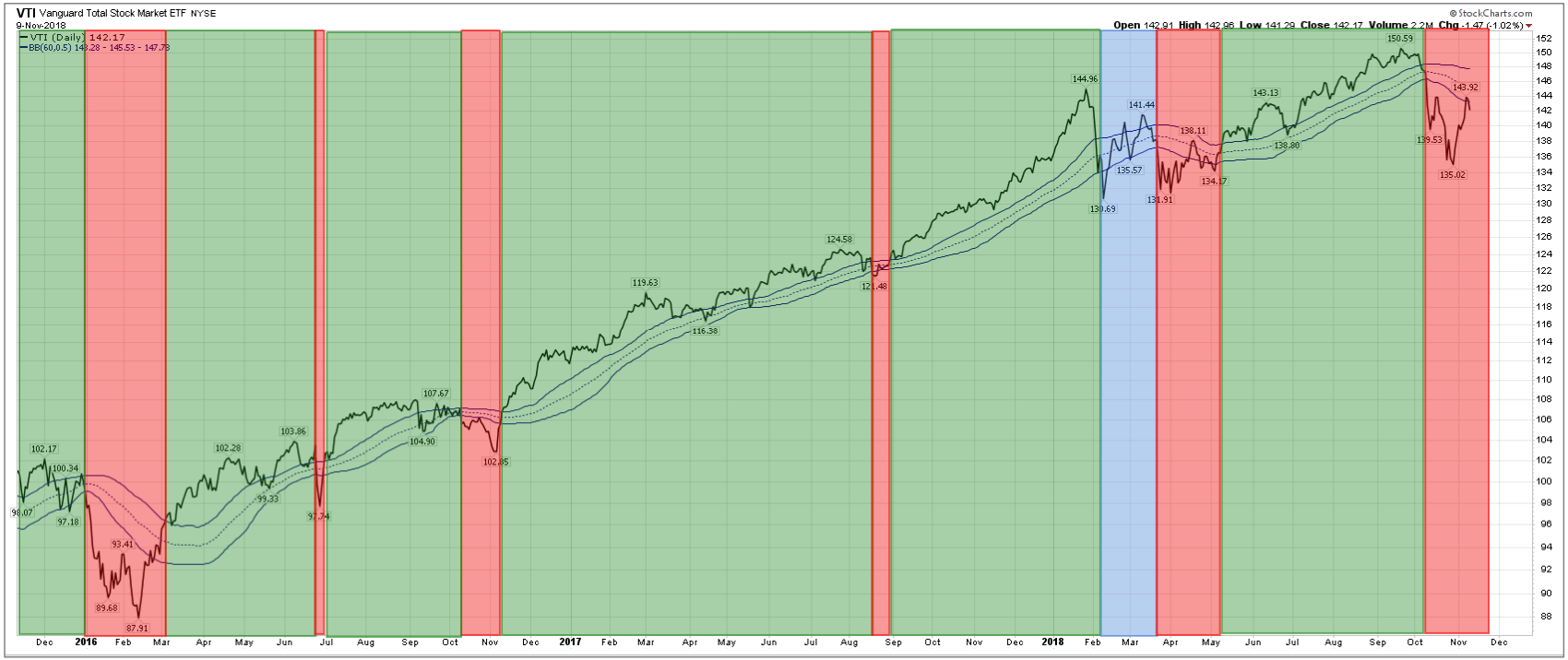
TREND DIRECTION IDENTIFICATION

SIMPLE RULES USING BOLLINGER BANDS

SIMPLE EXAMPLE

- BUY when the close crosses the Top BB (60,0.5) Band
- SELL when the close crosses below the Bottom BB (60,0.5) Band

VISUALLY…..HOW DOES THE CONCEPT LOOK?



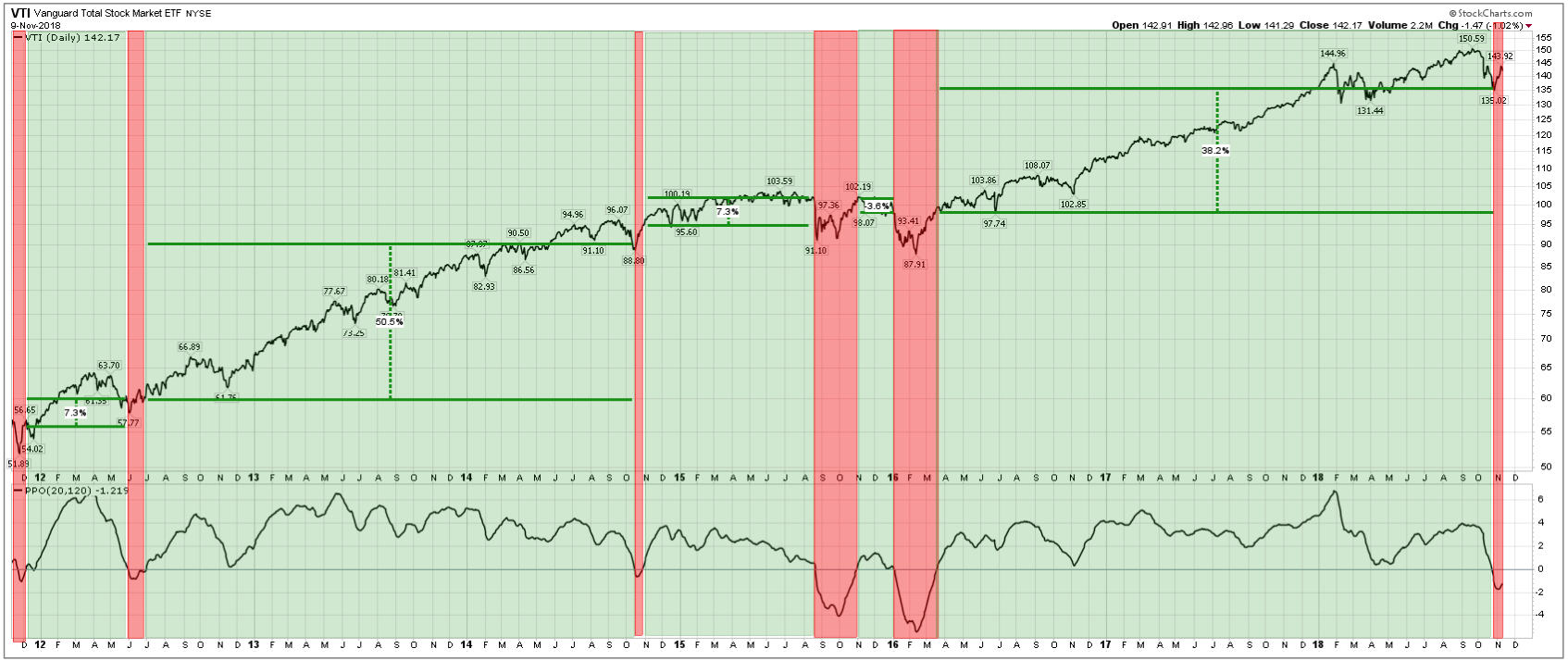
TREND DIRECTION IDENTIFICATION

SIMPLE RULES USING THE PPO

SIMPLE EXAMPLE

- BUY when the PPO(20,120) crosses above zero;
- SELL when the PPO(20,120) crosses below zero;

VISUALLY…..HOW DOES THE CONCEPT LOOK?



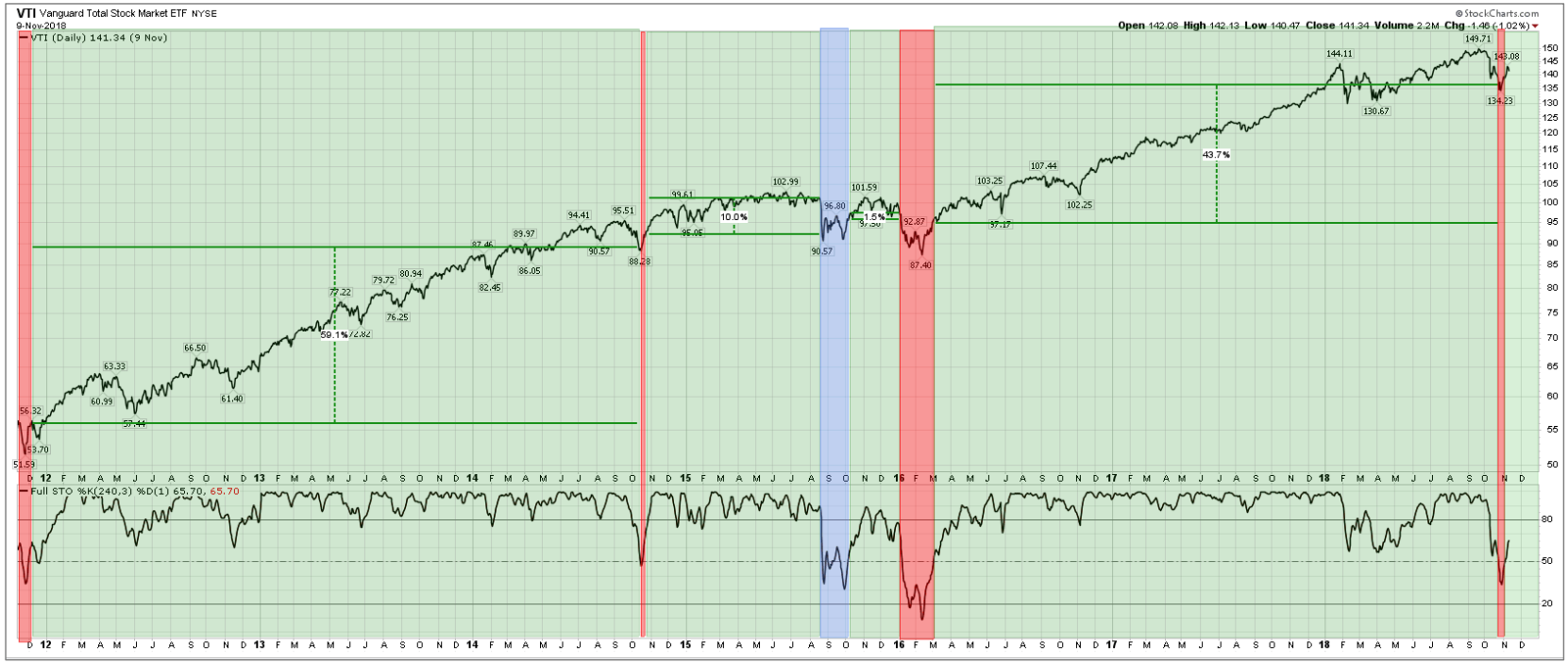
TREND DIRECTION IDENTIFICATION

SIMPLE RULES USING THE STOCHASTIC

SIMPLE EXAMPLE

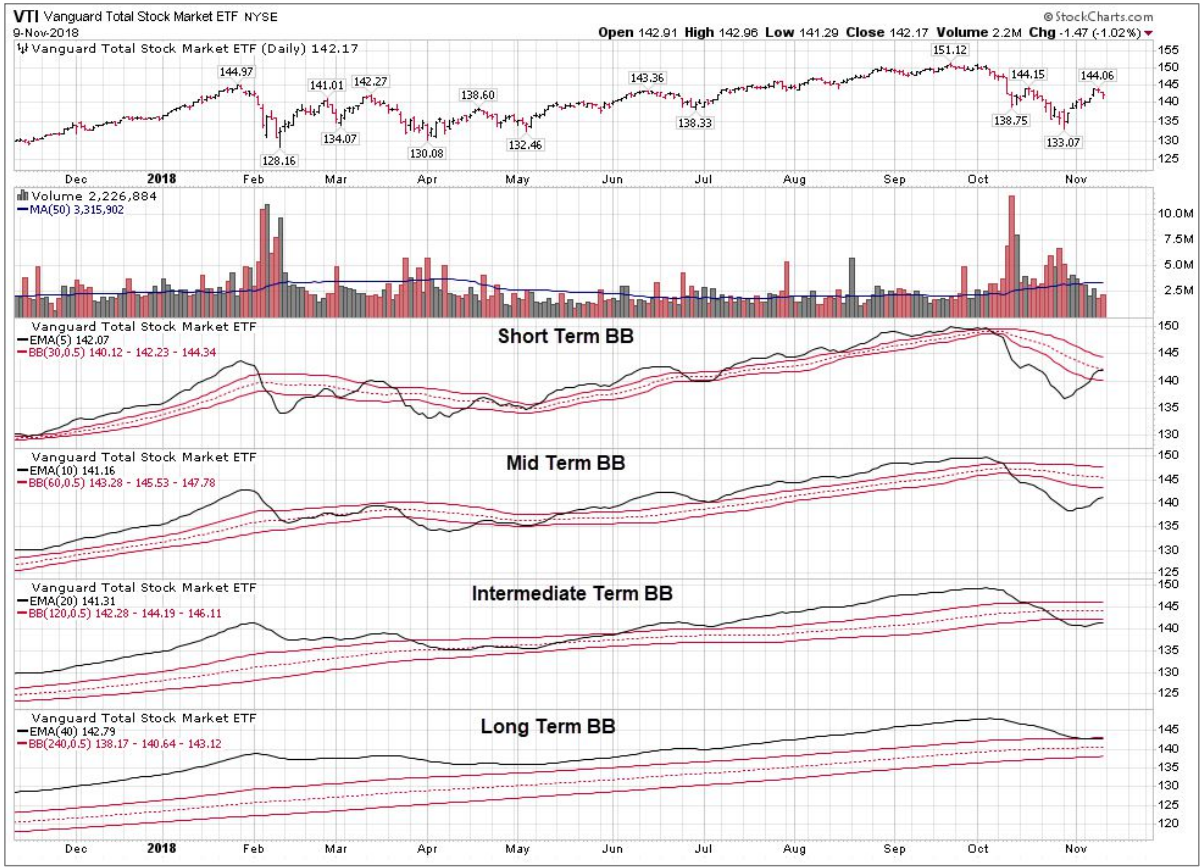
- BUY when the Full STO (240,3) crosses above 50;
- SELL when the Full STO (240,3) crosses below 50;

VISUALLY…..HOW DOES THE CONCEPT LOOK?



TREND FOLLOWING STRATEGY

MULTIPLE BOLLINGER BANDS

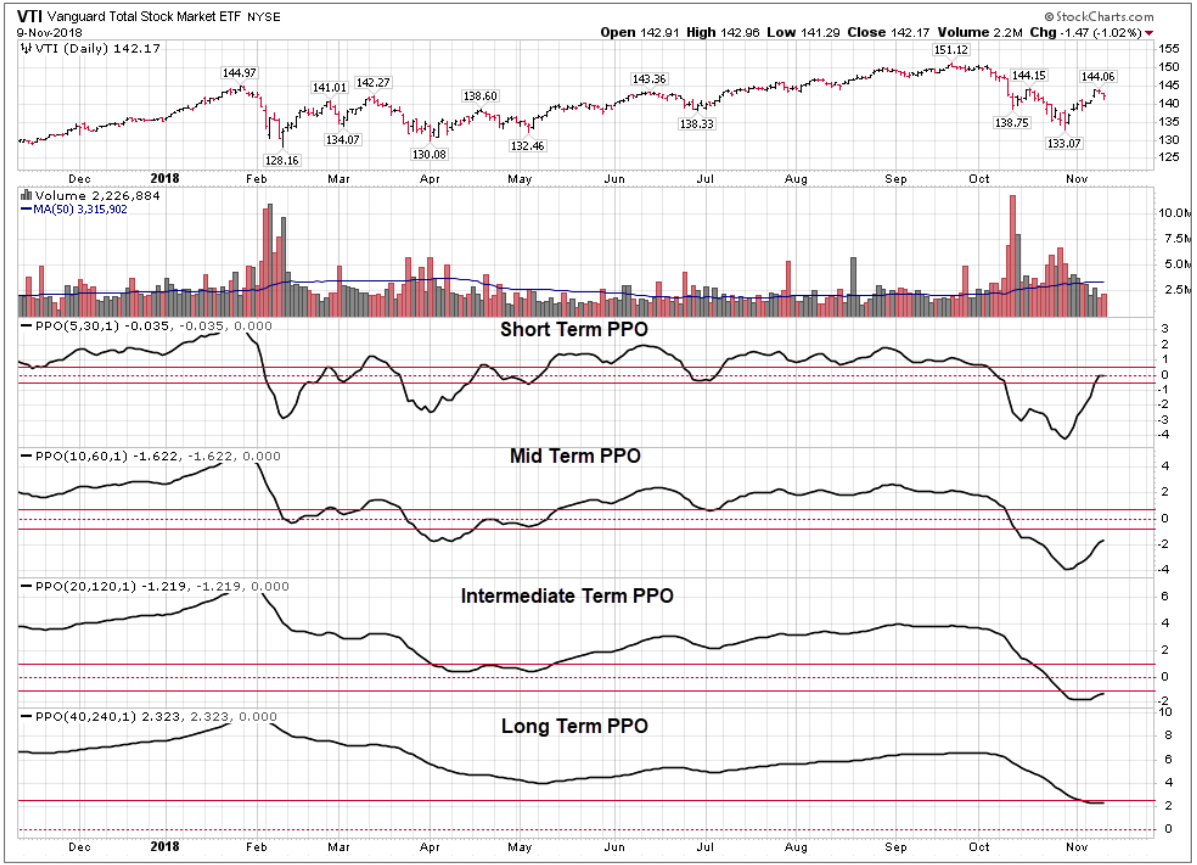




Time Frame	EMA	Bollinger Bands
Short	5	(30,0.5)
Mid	10	(60,0.5)
Intermediate	20	(120,0.5)
Long	40	(240,0.5)

TREND FOLLOWING STRATEGY

MULTIPLE PPO's

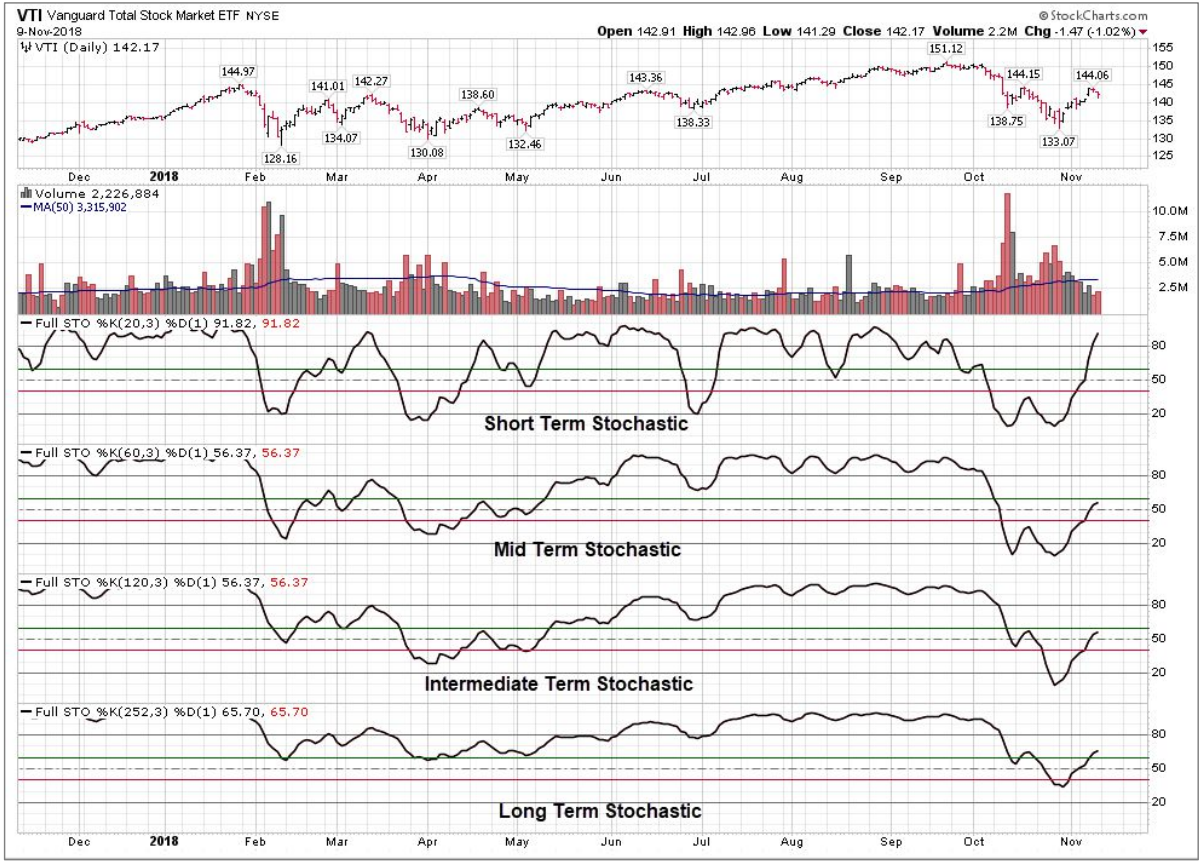


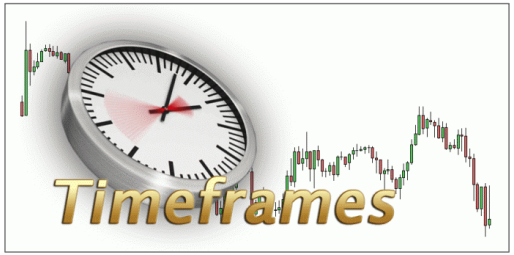


Time Frame	PPO's
Short	(5, 30)
Mid	(10,60)
Intermediate	(20,120)
Long	(40,240)

TREND FOLLOWING STRATEGY

MULTIPLE STOCHASTICS





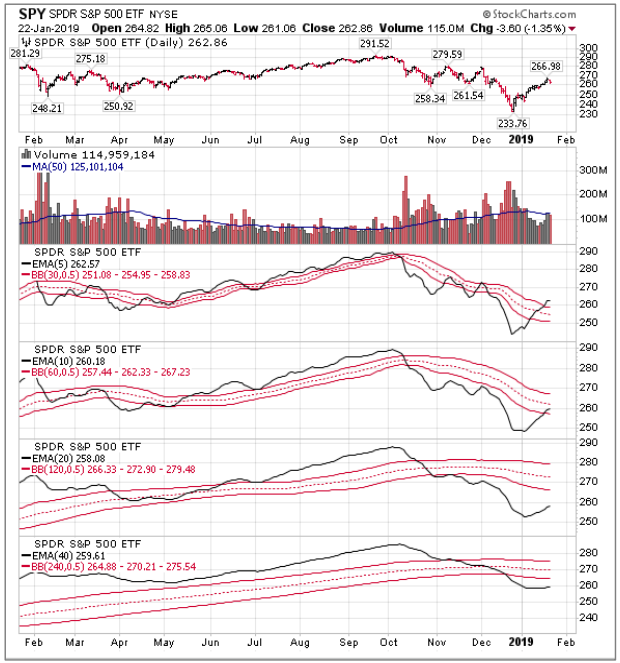
Time Frame	Full STO
Short	(20, 3)
Mid	(60,3)
Intermediate	(120,3)
Long	(240,3)

TREND FOLLOWING STRATEGY

PPO, BOLLINGER BANDS AND STOCHASTICS

BASIC TREND FOLLOWING CONCEPTS USING THREE DIFFERENT METHODS







TREND FOLLOWING STRATEGY

MULTIPLE BOLLINGER BANDS



BASIC TREND FOLLOWING ENTRIES AND EXITS

The following concept can be applied to the BB'S, PPO or Stochastic Trend following strategies;

- **Bullish = Fast EMA > BB Top**
- **Flat (Neutral) = Fast EMA between the BB Top and BB Bottom**
- **Bearish = Fast EMA < BB Bottom**

Buy signals are generated when the Fast EMA crosses above the Top BB;

Sell Signals are generated when the Fast EMA crosses below the Bottom BB;

Four BB settings = buy and sell signals on four timeframes;

KEY TAKEAWAY – for each buy and sell signal, think ¼ position entry or exits. The trend will tell you whether you want to be fully, partially or not invested. This is longer term thinking and not trading!

Buy and sell signals shown on the four timeframes of the BB Trend Following strategy (left);

TREND FOLLOWING STRATEGY

KEY CONCEPT #1

BINARY QUESTIONS

A Binary Question is question that has only two possible outcomes is termed a Binary Question. For example: Questions which can have answer like True/False or Yes/No are Binary Questions.



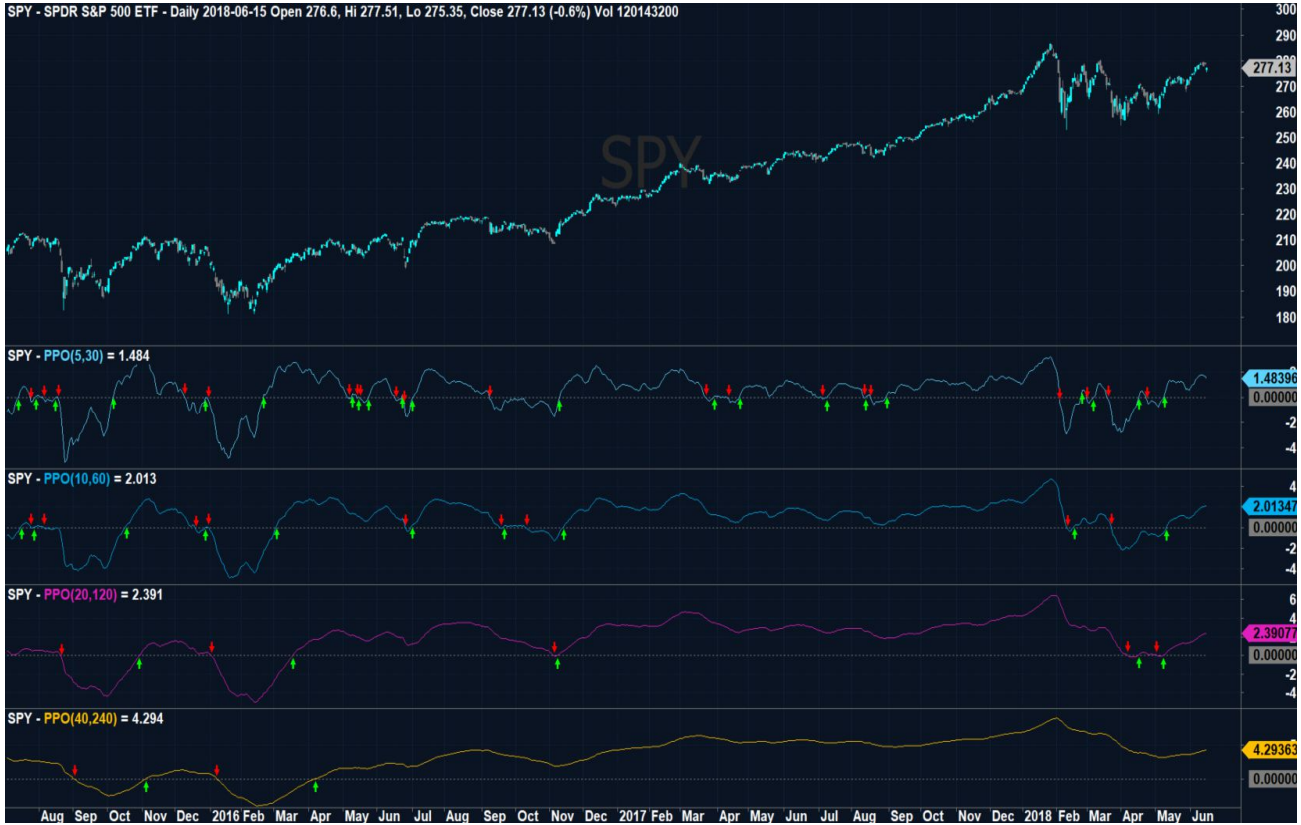
"If you take emotion – would be, could be, should be – out of it, and look at what is, and quantify it, I think you have a big advantage over most human beings."

John Henry of John W. Henry and Company, Inc.

TREND FOLLOWING STRATEGY

ASKING THE RIGHT QUESTIONS

S&P PPO Trend Following Signals Aug 2015 – June 2018



PPO SETTING	BULLISH >0 = 1	BEARISH < 0 = 0
Short Term PPO (5,30)	✓	
Mid Term PPO (10,60)	✓	
Intermediate Term PPO (20,120)	✓	
Long Term PPO (40,240)	✓	

CREATING A TREND FILTER

TRENDS ON MULTIPLE TIMEFRAMES

CREATING A BINARY TREND TRACKING SYSTEM

SHORT TERM TREND (ST)

If Bullish = 1 → Trend Filter Weighting = 10%
If Bearish = 0 → Trend Filter Weighting = 0%

MID TERM TREND (MT)

If Bullish = 1 → Trend Filter Weighting = 20%
If Bearish = 0 → Trend Filter Weighting = 0%

INTERMEDIATE TERM TREND (IT)

If Bullish = 1 → Trend Filter Weighting = 30%
If Bearish = 0 → Trend Filter Weighting = 0%

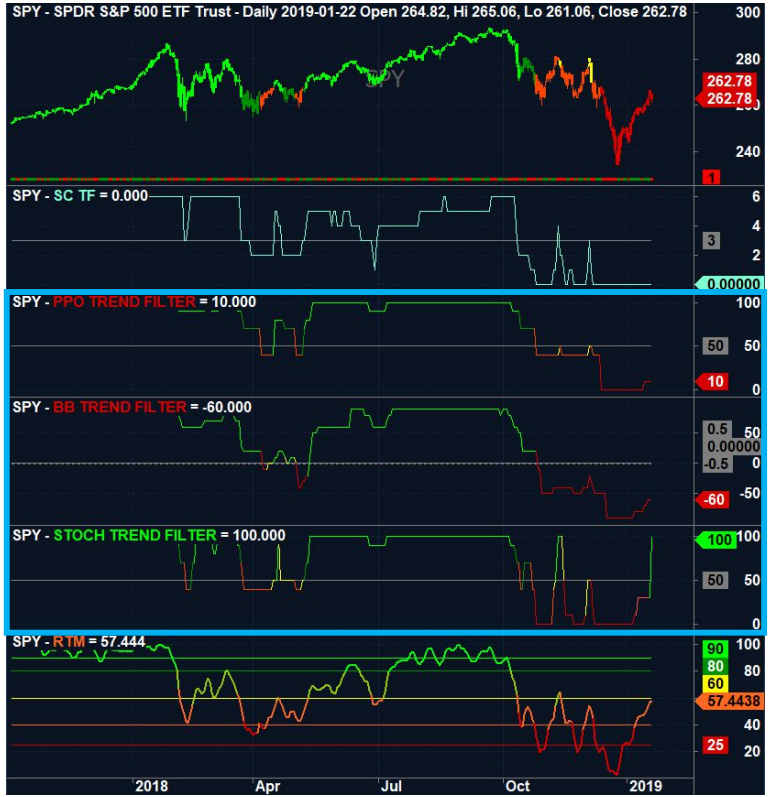
LONG TERM TREND (LT)

If Bullish = 1 → Trend Filter Weighting = 40%
If Bearish = 0 → Trend Filter Weighting = 0%

TREND FILTER = ST + MT + IT + LT

THE ABOVE FORMULA WILL PRODUCE A BINARY TREND FOLLOWING SYSTEM.
THE READINGS OF THE TREND FILTER WILL BE EXPRESSED AS A PERCENTILE.

Trend Filters
Discussed today

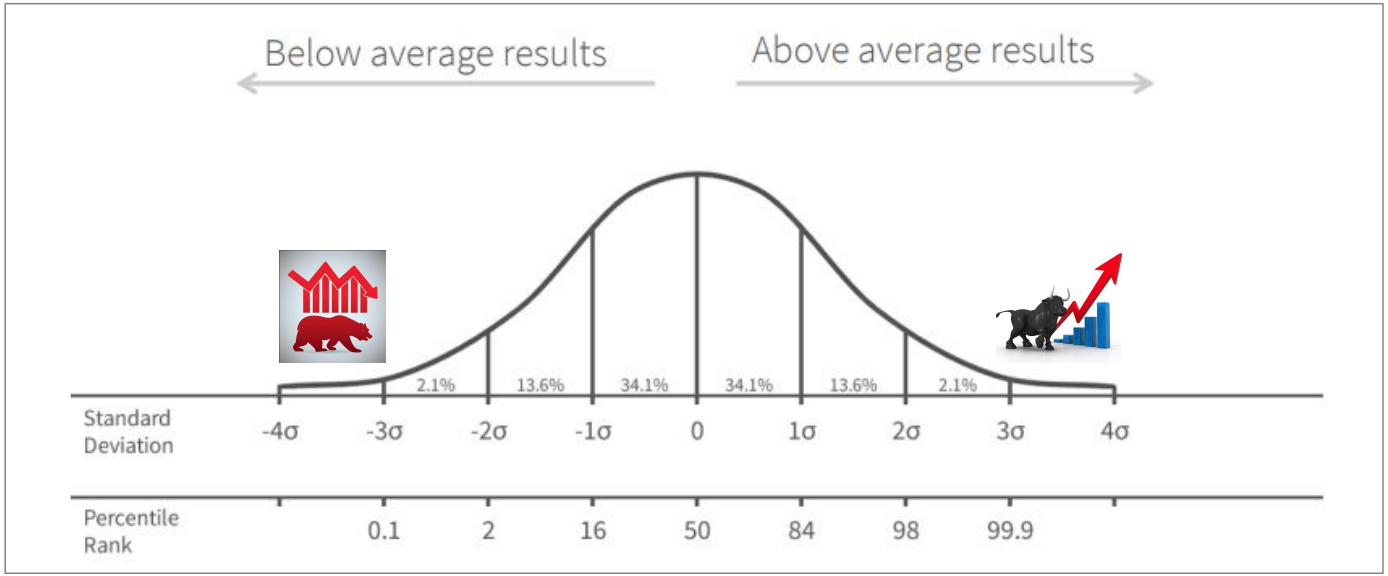


TREND FOLLOWING STRATEGY

KEY CONCEPT #2

PERCENTILE RANKING

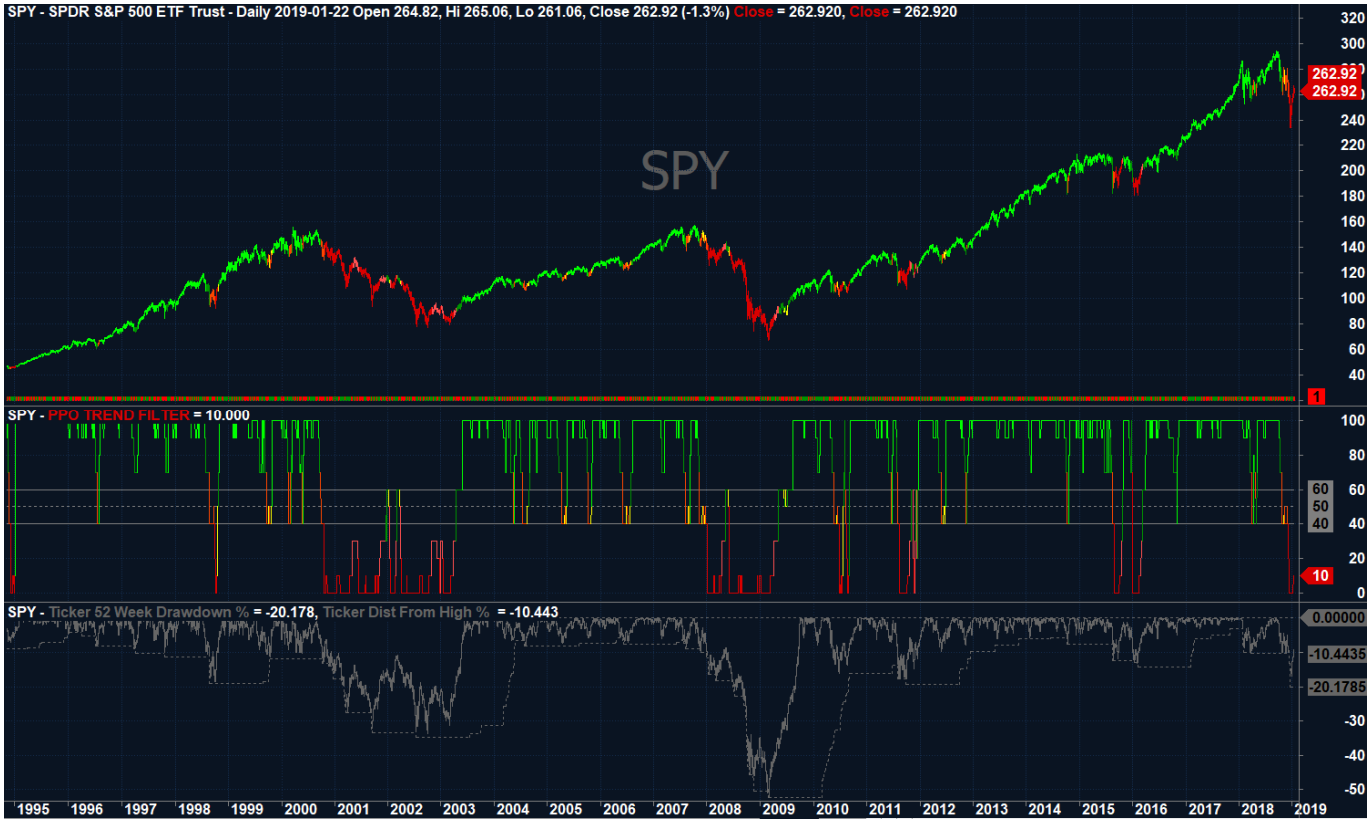
A simple way to think of Percentile Ranking is a ranking system of a basket of data points that normalizes the data to produce a score between 0 and 100. A percentile rank of 80 means that the rank is greater than 80% of all other scores being compared. For our purposes the lowest percentile rank of 0 would be bearish and the maximum percentile rank of 100 would be bullish. A reading of 50 would be considered Neutral. Depending on the ranking we can lean either bullishly, bearishly or simply neutral.



TREND FOLLOWING

PPO BINARY TREND FILTER

WHEN THE TREND FILTER IS <u>NOT</u> GREEN……CAUTION IS WARRANTED



<u>TREND FILTER VALUE'S</u>

TF > 80 – MOST BULLISH

TF< 80 AND TF>=60

TF<60 AND TF>=50

TF<50 AND TF>=40

TF<40 AND TF>=20

TF<20 – MOST BEARISH

Strong

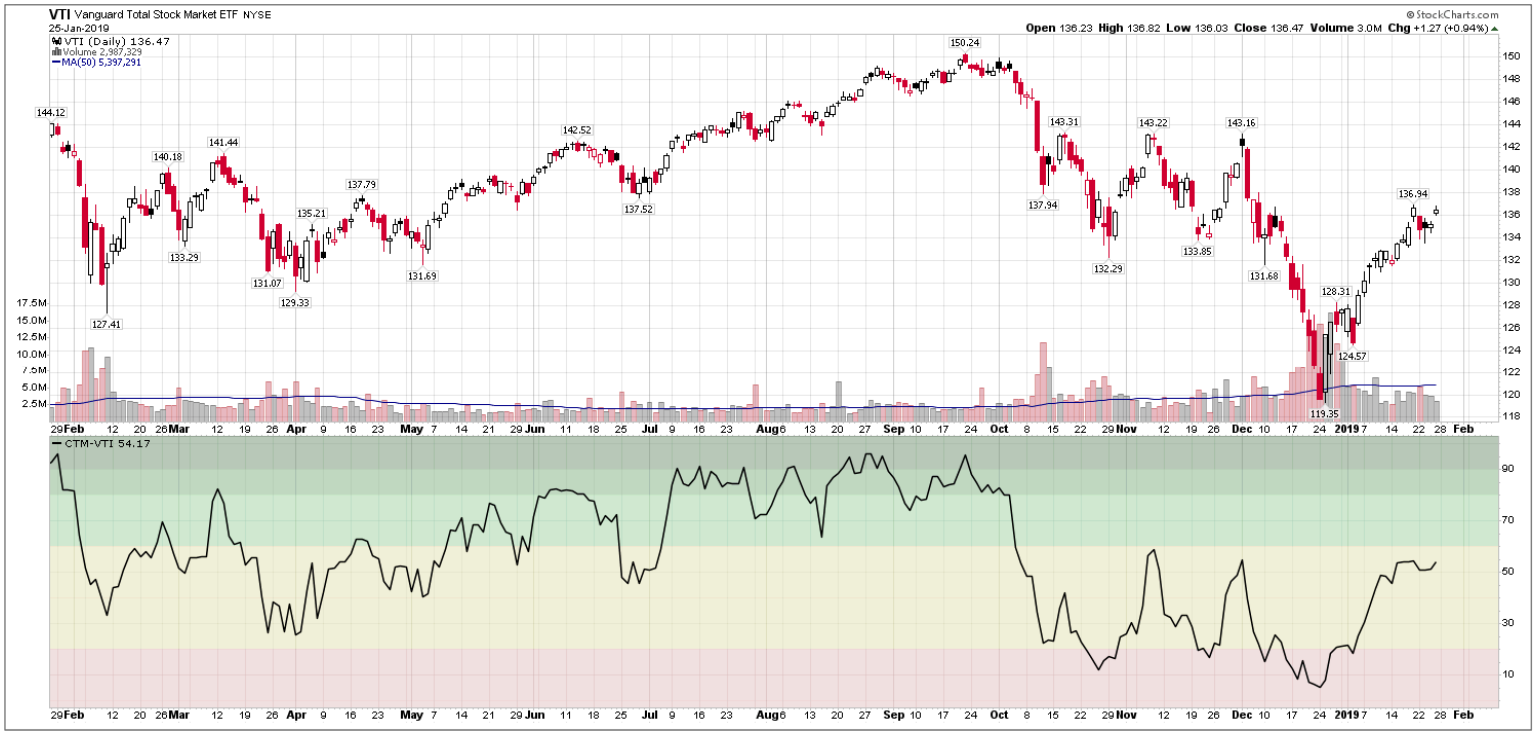
Neutral

Weak

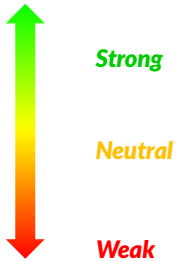
TREND FOLLOWING

STOCKCHARTS.COM – CHANDE TREND METER

STOCKCHARTS.COM – CHANDE TREND METER



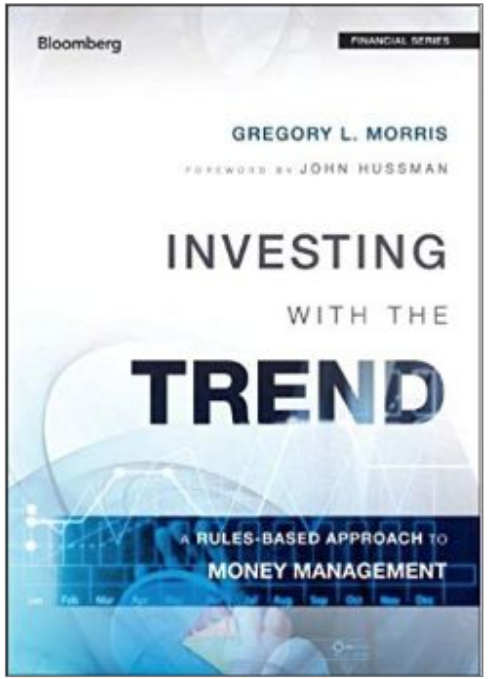
TREND STRENGTH

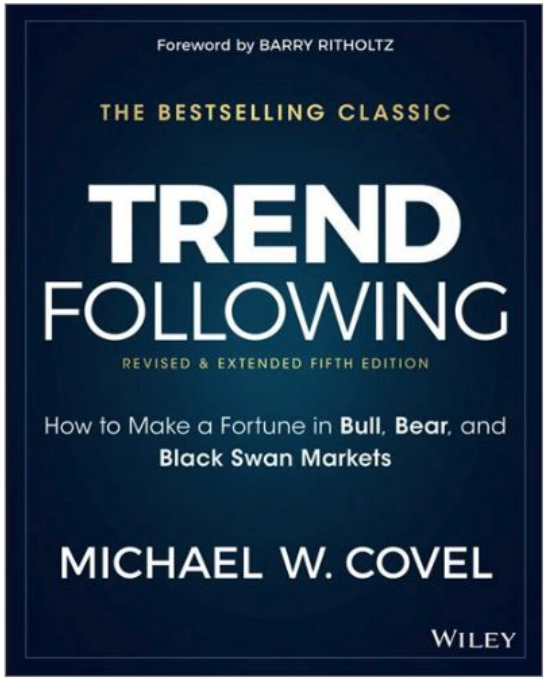


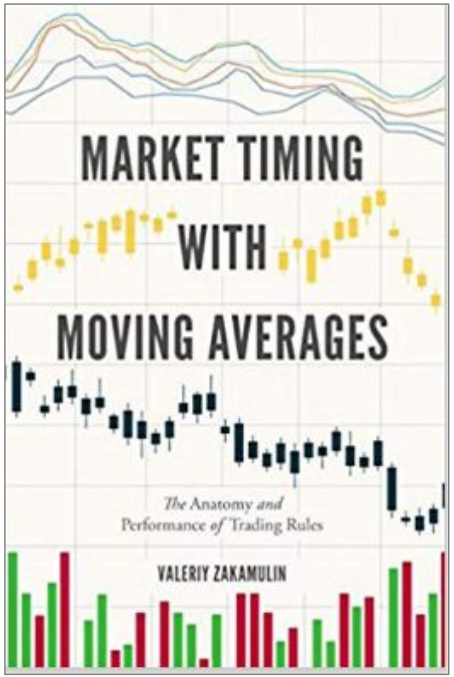
https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:chande_trend_meter

TREND FOLLOWING REFERENCES

TIM'S RECOMMENDATIONS









RELATIVE STRENGTH (RS)

- BASIC CONCEPT;
- PRICE RATIO (RPR);
- RPR ANALYSIS ON OFFENSIVE AND DEFENSIVE ASSETS;
- RS USING INDICATORS;
- DOES RELATIVE STRENGTH REALLY WORK?
- REFERENCES;
- KEY TAKEAWAYS;

RELATIVE STRENGTH
BASIC CONCEPT

RELATIVE STRENGTH BASIC CONCEPT

Relative strength analysis involves the comparison of the performance of one security against another. This type of analysis is useful to determine the performance of a particular asset class against a benchmark index, sector or industry group.

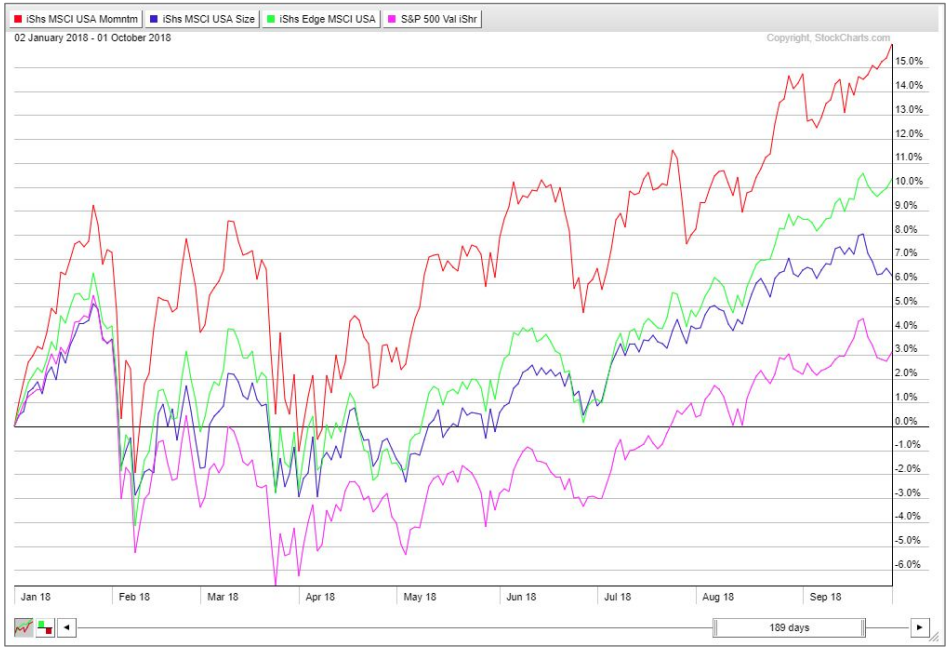
Chart right illustrates a price performance comparison between four US Asset Allocation ETF's from Jan 2, 2018 – October 1, 2018 as noted below;

- MTUM - ISHARES EDGE MSCI USA MOMENTUM FACTOR ETF (15.99%)
- SIZE - ISHARES EDGE MSCI USA SIZE FACTOR ETF (6.28%)
- QUAL - ISHARES EDGE MSCI USA QUALITY FACTOR ETF (10.35%)
- IVE - ISHARES S&P 500 VALUE ETF (3.12 %)

Year to date performance values have been shown in brackets above.

Out of these simple four ETF's we can see that the relative strength of the market resides in MTUM and QUAL.

IVE is a clear laggard in this example.



RELATIVE STRENGTH ANALYSIS

PRICE RATIO (PR)

Price Ratio (PR) divides the value one ticker symbol by the value another ticker symbol.

PRICE RATIO (PR) = SYMBOL #1 / SYMBOL #2

Chart right is comprised of a three panes.

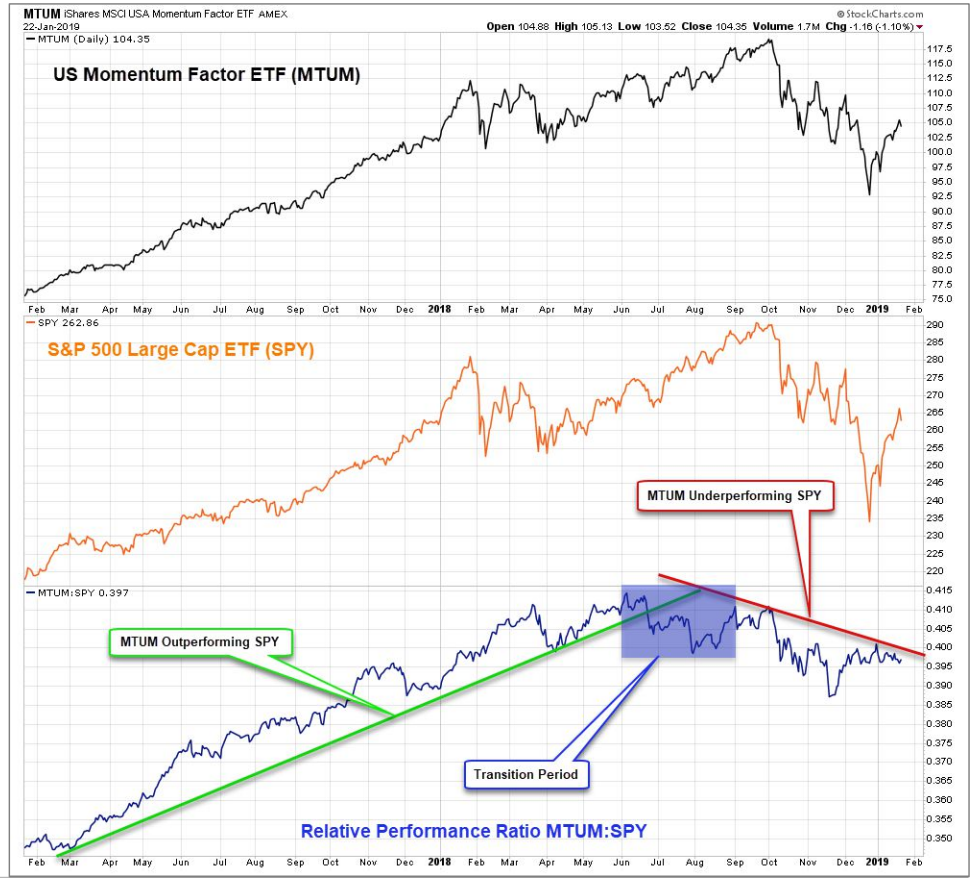
The top pane illustrates the daily candle chart of the ISHARES EDGE MSCI USA MOMENTUM FACTOR (MTUM).

The middle pane illustrates the daily candle chart of the S&P 500 Large Cap ETF (SPY).

The bottom pane illustrates the PR line of MTUM / SPY

The bottom right limits of the chart show a PR value of 0.397
This value is calculated by dividing the closing price of MTUM by the closing price of SPY on Tuesday January 22, 2019.

PR = MTUM (close) / SPY (close)
PR = $104.35 / 262.86
PR = 0.397



RELATIVE STRENGTH ANALYSIS

OFFENSIVE VS DEFENSIVE ASSETS

RELATIVE PRICE RATIOS CAN ALSO BE USED ON OFFENSIVE AND DEFENSIVE ASSET PAIRINGS









RELATIVE STRENGTH ANALYSIS

THE INDICATORS

WE CAN USE RELATIVE INDICATORS TO ASSESS RELATIVE STRENGTH AMONG ASSETS



PPO (1,200,1)

Full STO (200,1)

ROC (200)

RELATIVE STRENGTH ANALYSIS

DOES RELATIVE STRENGTH REALLY WORK?

WHY FOLLOW RELATIVE STRENGTH?? LET THE RESULTS SPEAK TO YOU!

Portfolio Strategy

Beating Mr. Market: ETF Strategy Backtests, Galore

Mar. 11, 2012 8:55 AM ET | 9 comments | Includes: AGG, DBC, GSG, RWX, TIP, VB, VEU, VNQ, VTI, VWO

Scott's Investments Mute

Independent research, long/short equity, dividend investing, ETF investing

Follow

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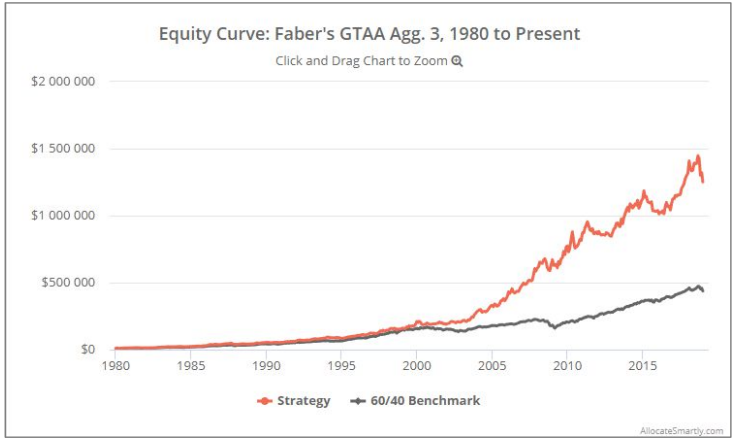
"Below are backtest results for a relative strength ETF strategy. Returns include dividends but exclude commissions, taxes, and slippage (in other words, real results *will* differ). The buy/sell strategy for the portfolio is simple: purchase the top ETFs based on a combination of their 6 month returns, 3 month returns, and 3 month volatility (lower volatility receives a higher ranking) and the average of the 3 month return, 20 day return, and 20 day volatility. I refer to these two different sets as "6/3/3" and "3/20/20". The top 2 ETFs in the 6/3/3 ranking and top 2 in the 3/20/20 ranking are purchased each month."

https://seekingalpha.com/article/425601-beating-mr-market-etf-strategy-backtests-galore



DYNAMIC ASSET ALLOCATION (DAA)

GTAA_AGG_3 HISTORICAL PERFORMANCE

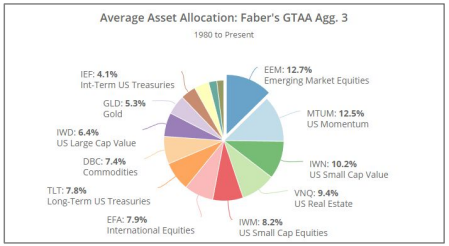


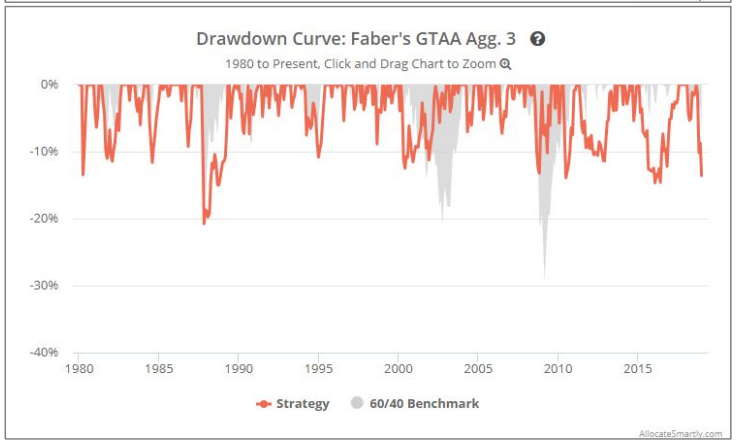
Summary Statistics: Faber's GTAA Agg. 3

Based on Month-End Data, 1980 to 11/2018

Statistic	Strategy	Benchmark	Statistic	Strategy	Benchmark
Annualized Return	13.4%	10.3%	Annualized Volatility	12.6%	9.5%
Sharpe Ratio	0.71	0.62	Sortino Ratio	1.24	1.05
Max Drawdown (EOM)	-20.8% 10/1987	-29.5% 02/2009	Longest Drawdown	33 months	40 months
Ulcer Performance Index	1.54	1.06	% Profitable Months	63.2%	66.0%
Best Month Return	14.8%	9.7%	Worst Month Return	-13.5%	-10.7%
Average Trades per Year	20.2	0.1	Annual Turnover	353.5%	12.6%

www.allocatesmartly.com



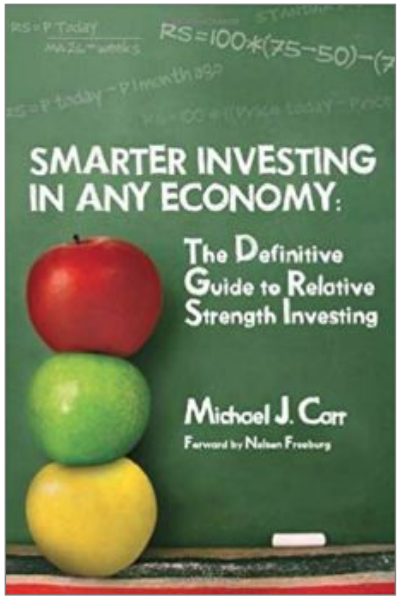


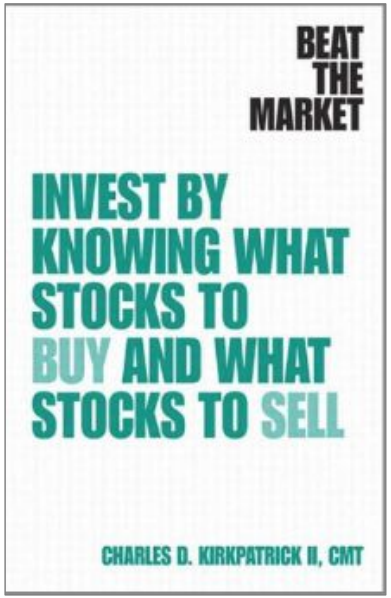
The strategy rules tested here:

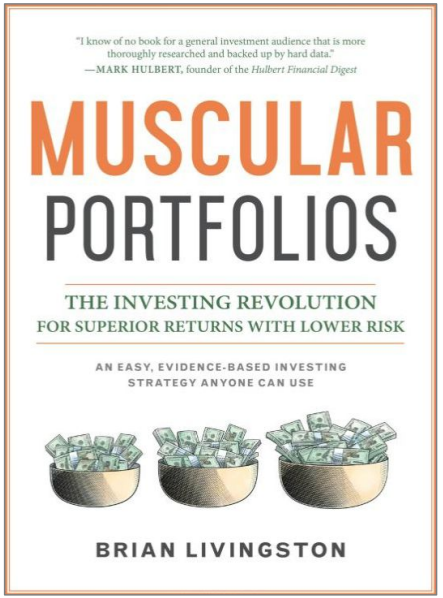
- **At the close on the last trading day of the month, calculate the 1, 3, 6, and 12-month returns for each of 13 global asset classes.**
- **Calculate the average of the four values above for each asset class. Go long the 3 asset classes with the highest average value, with 1/3 of the portfolio allocated to each (relative momentum), *unless* that asset will close below its 10-month moving average, in which case that portion of the portfolio is allocated to cash (absolute momentum).**
- **Hold positions until the final trading day of the following month. Rebalance the entire portfolio monthly, regardless of whether there is a change in position.**

RELATIVE STRENGTH REFERENCES

TIM'S RECOMMENDATIONS







OTHER REFERENCES TO BE DISCUSSED LATER IN THIS MODULE

RELATIVE STRENGTH

KEY TAKEAWAY



USE IT TO YOUR ADVANTAGE!



MARKET BREADTH

- INTRODUCTION
- ADVANCE DECLINE PERCENT (ADP)
- VOLUME ADVANCE DECLINE PERCENT (UDP)
- NEW HIGH – NEW LOW PERCENT (HLP)
- % STOCKS ABOVE THE 200 DAY EMA
- MASSAGING THE DATA
- BULLISH AND BEARISH TRIGGERS

MARKET BREADTH ANALYSIS

INTRODUCTION



MARKET BREADTH INDICATORS

- Market Breadth Indicators (MBI) are sometimes referred to as broad market indicators;
- MBI's do not generally refer to or use information relating to an individual issue;
- Breadth treats all issues equally. The stock with the largest cap weight and the stock with the smallest cap weight are equal;
- MBI's look at the market, index, sector, industry group as a whole;
- Market Breadth Analysis uses data such as Advancing and Declining Issues, New Highs and New Lows, Advancing and Declining Volume
- These broad market indicators monitor the health of the markets (Strength or Weakness);

WE CAN THINK OF MARKET BREADTH INDICATORS LIKE A SET OF HEADLIGHTS, ILLUMINATING THE ROADWAY AHEAD JUST ENOUGH TO SEE THE BENDS.

HOW HEALTHY IS THE ENGINE OF THE MARKET??

ALL SYSTEMS GO!
BULLISH MARKET CONDITIONS



THE CHECK ENGINE LIGHT
"S.A.R" MARKET CONDITIONS



ENGINE MALFUNCTION
BEARISH MARKET CONDITIONS



"S.A.R" = SOMETHING AIN'T RIGHT

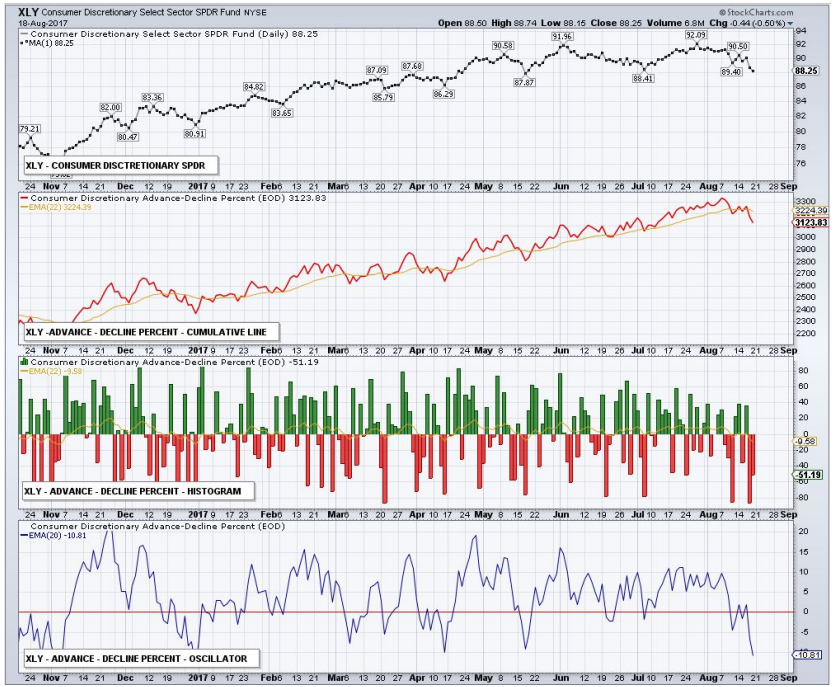
MARKET BREADTH INDICATORS

ADVANCE – DECLINE PERCENT (ADP)

Advance – Decline Percent (ADP)

- The Advance – Decline Percent is breadth indicator is an indicator that measures the percentage of net advances of a particular group of stocks.
- Net Advances equals the number of advances less the number of declines.
- AD Percent equals Net Advances divided by total number of stocks in the group.
- The following stockcharts.com link outlines this indicator in more detail;

http://stockcharts.com/school/doku.php?st=advance+decline+percent&id=chart_school:index_symbols:ad_percent



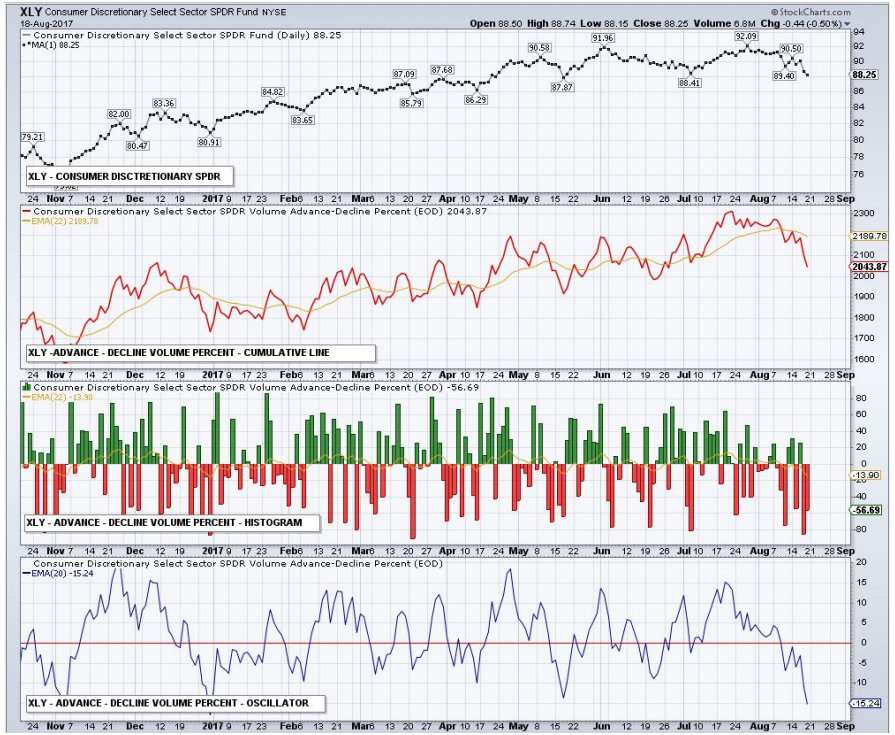
MARKET BREADTH INDICATORS

ADVANCE – DECLINE VOLUME PERCENT (UDP)

Advance – Decline Volume Percent (UDP)

- The Advance – Decline Volume Percent is breadth indicator is an indicator that measures the percentage of net advancing volume of a particular group of stocks.
- Net Advancing volume equals the advancing volume less the declining volume, divided by the total volume.
- The following stockcharts.com link outlines this indicator in more detail;

http://stockcharts.com/school/doku.php?st=ud+percent&id=chart_school:technical_indicators:ad_vol_percent



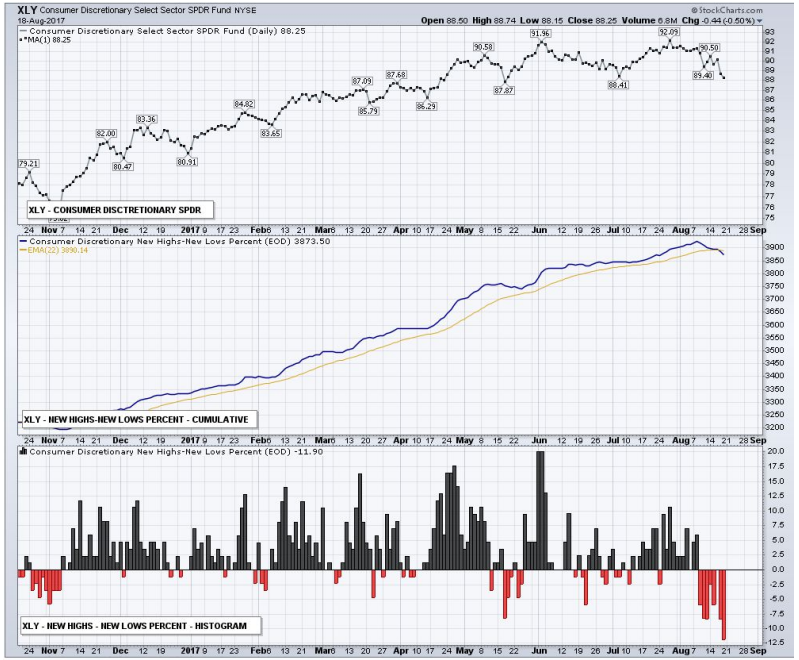
MARKET BREADTH INDICATORS

NEW HIGH – NEW LOW PERCENT (HLP)

New High – New Low Percent (HLP)

- The High-Low Percent breadth indicator is an indicator that measures the percentage of Net New Highs.
- The Net new highs equals the number of 52 week highs less the number of 52 week lows divided by the number of total issues.
- The following stockcharts.com link outlines this indicator in more detail;

http://stockcharts.com/school/doku.php?st=hi+low+percent&id=chart_school:technical_indicators:high_low_percent



MARKET BREADTH INDICATORS

% STOCKS ABOVE A MOVING AVERAGE

% of Stocks above a Moving Average

- The % stocks above a moving Average Market Breadth indicator is just as simple as it sounds.
- This indicator measures the number of stocks above a 20,50 or 200-day moving average. A rising tide floats all ships.
- Accordingly, when the majority of stocks remain above their respective moving averages, breadth is strengthening. This is interpreted as strong or bullish market sentiment.
- Breadth weakens when the majority of stocks above their respective moving averages declines. This is interpreted as weak or bearish market sentiment.




SPY SPDR S&P 500 ETF NYSE
19-Feb-2021
SPY (Daily) 390.03
MA(200) 339.78
Open 392.07 High 392.38 Low 389.55 Close 390.03 Volume 83.2M Chg -0.69 (-0.18%)
S&P 500 Large Cap Index ETF (SPY)
$SPXADP 9152.40
EMA(60) 8965.65
EMA(10) 9126.08
Advance - Decline Percent (ADP)
$SPXHLP 8258.99
EMA(10) 8222.13
New- High New Low Percent (HLP)
!GT50SPX 69.60
% Stocks above the 50-day EMA
!GT200SPX 87.20
% Stocks above the 200-day EMA



MOMENTUM

- MOMENTUM VS RELATIVE STRENGTH;
- SHARPE, SORTINO, ULCER…WHAT THEY DIDN'T KNOW;
- ABSOLUTE MOMENTUM;
- RELATIVE MOMENTUM;
- DUAL MOMENTUM;



MOMENTUM IS OFTEN FEARED AND MISUNDERSTOOD IN THE MARKET, HOWEVER AS INVESTORS WE SHOULD BE OPEN TO THE IDEA!!

MOMENTUM
VS TREND FOLLOWING VS RELATIVE STRENGTH

Trend Following vs Relative Strength vs Momentum
(Cousins In The Same Family)







TREND FOLLOWING | **MOMENTUM** | **RELATIVE STRENGTH**

ABSOLUTE MOMENTUM (Time-Series)

- Performance comparison of a asset vs itself;

RELATIVE MOMENTUM (Cross - Sectional)

- Performance comparison of an asset vs an asset or basket of assets;

SHARPE, SORTINO, ULCER
WERE THEY ONTO SOMETHING?

SHARPE RATIO

The Sharpe can be calculated as follows:

SHARPE RATIO$= \frac{Re - Rf}{\sigma}$

where;
Re = Expected Return
Rf= The Risk Free Rate of Return
σ = Standard Deviation

SORTINO RATIO

The Sortino Ratio can be calculated as follows:

SORTINO RATIO$= \frac{Re - Rf}{\sigma d}$

where;
Re = Expected Return
Rf= The Risk Free Rate of Return
σ = Semi- Deviation

ULCER PERFORMANCE INDEX (UPI)

The Ulcer Performance Index can be calculated as follows;

UPI $= \frac{Re - Rf}{Ui}$

where;
Re = Expected Return
Rf = The Risk Free Rate of Return
Ui = Ulcer Index

"It's the little details that are vital. Little things make big things happen." - *John Wooden*

ABSOLUTE MOMENTUM = Expected Portfolio Return – **Risk Free Returns

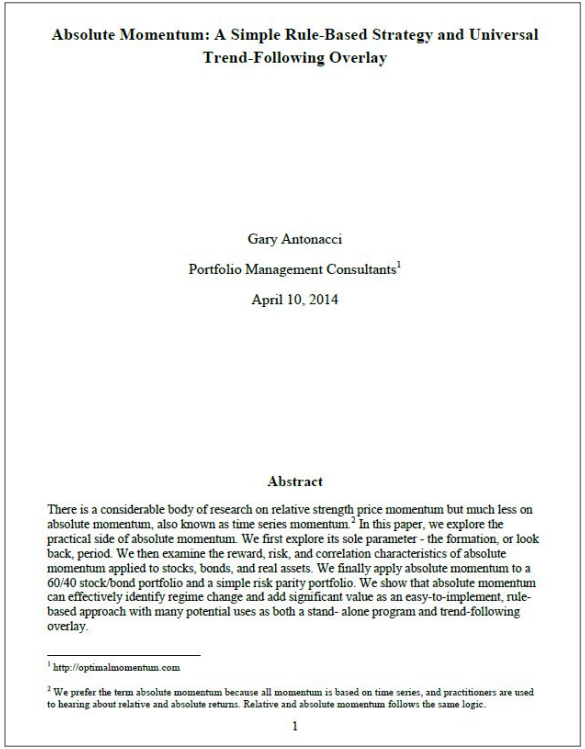
** Risk Free Returns are typically measured by the return of a Treasury Bill over a specified period of time. Treasury bills have maturities of a year or less.

ABSOLUTE MOMENTUM
TREND FOLLOWING OVERLAY

“Absolute momentum appears to be just as robust and universally applicable as relative momentum.”

“our strategy simply defines absolute momentum as being positive when the excess return (asset return less the Treasury bill return) over the formation (look back) period is positive. We hold a long position in our selected assets during these times. When absolute momentum turns negative (i.e., an asset's excess return turns negative), our baseline strategy is to exit the asset and switch into 90-day U.S. Treasury bills until absolute momentum again becomes positive. Treasury bills are a safe harbor for us during times of market stress.”

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2244633



Absolute Momentum: A Simple Rule-Based Strategy and Universal Trend-Following Overlay

Gary Antonacci

Portfolio Management Consultants[1]

April 10, 2014

Abstract

There is a considerable body of research on relative strength price momentum but much less on absolute momentum, also known as time series momentum.[2] In this paper, we explore the practical side of absolute momentum. We first explore its sole parameter - the formation, or look back, period. We then examine the reward, risk, and correlation characteristics of absolute momentum applied to stocks, bonds, and real assets. We finally apply absolute momentum to a 60/40 stock/bond portfolio and a simple risk parity portfolio. We show that absolute momentum can effectively identify regime change and add significant value as an easy-to-implement, rule-based approach with many potential uses as both a stand- alone program and trend-following overlay.

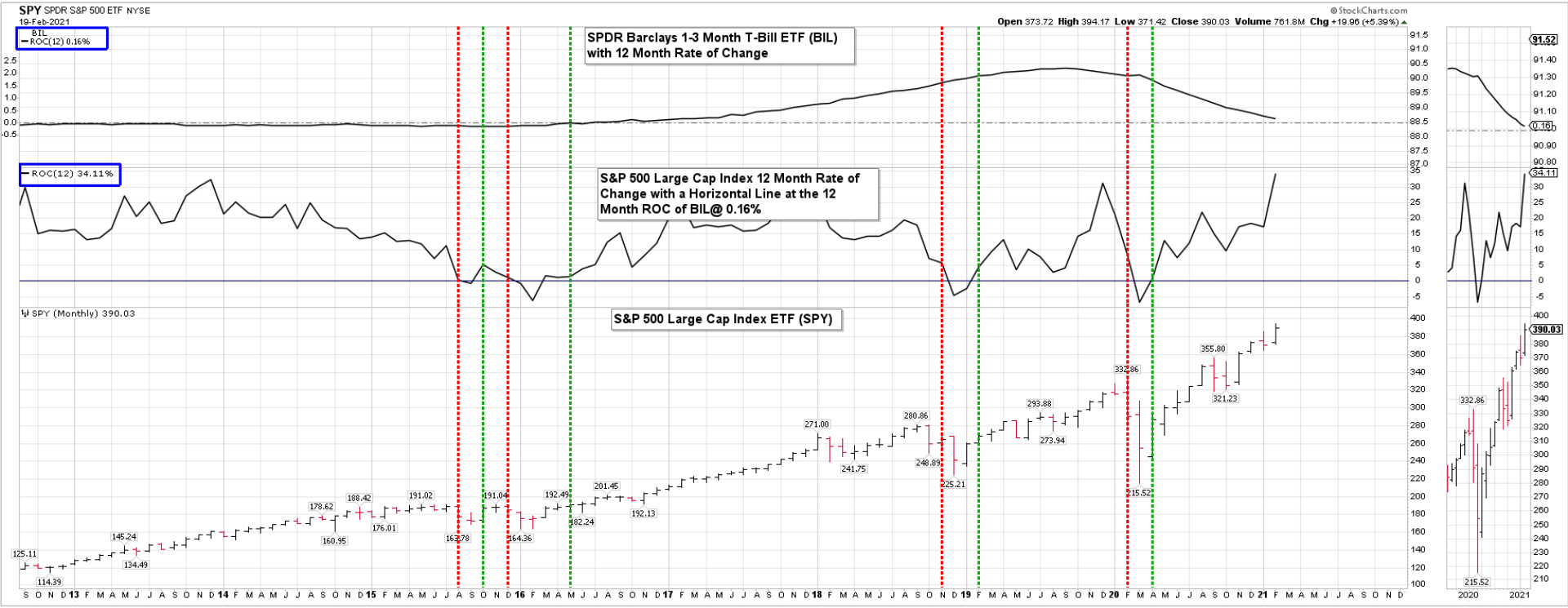
[1] http://optimalmomentum.com

[2] We prefer the term absolute momentum because all momentum is based on time series, and practitioners are used to hearing about relative and absolute returns. Relative and absolute momentum follows the same logic.

1

ABSOLUTE MOMENTUM

VISUALISING THE CONCEPT



ABSOLUTE MOMENTUM

THE RESULTS

ABSOLUTE MOMENTUM: A SIMPLE RULE-BASED STRATEGY AND UNIVERSAL TREND-FOLLOWING OVERLAY

Gary Antonacci Portfolio Management Consultants1, April 10, 2014

https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2244633

Table 4 60/40 Balanced Portfolio Performance 1974-2012

	Annual Return	Annual Std Dev	Annual Sharpe	Maximum Drawdown	% Profit Months	Correlation to S&P500	Correlation to 10 Yr Bond
60/40 w/Abs Mom	11.52	7.88	.72	-13.45	74	.67	.37
60/40 No Mom	10.86	10.77	.47	-29.32	63	.92	.46
MSCI US w/Abs Mom	12.26	11.57	.55	-22.90	75	.74	.13
MSCI US No Mom	11.62	15.74	.37	-50.65	61	1.00	.10

Figure 14 Rolling 5-Year Maximum Drawdown 1979-2012

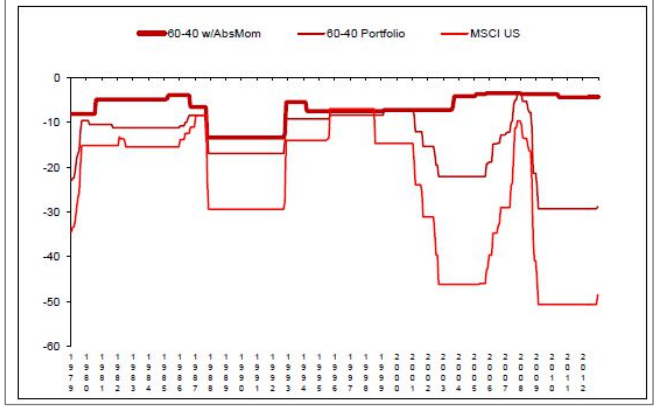
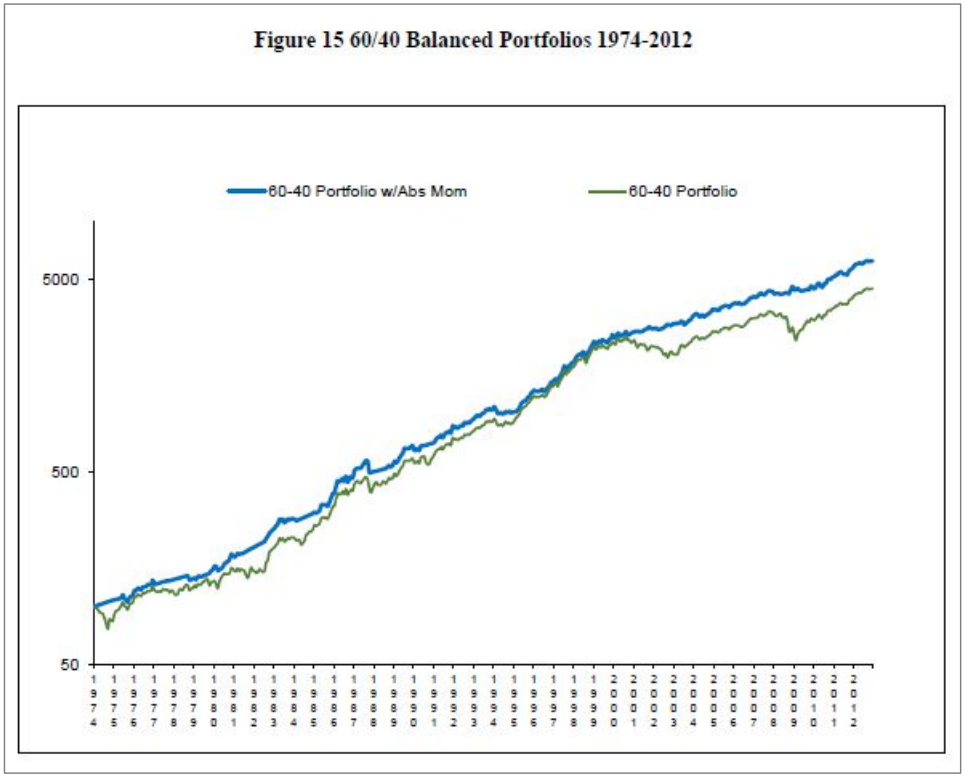


Figure 15 60/40 Balanced Portfolios 1974-2012

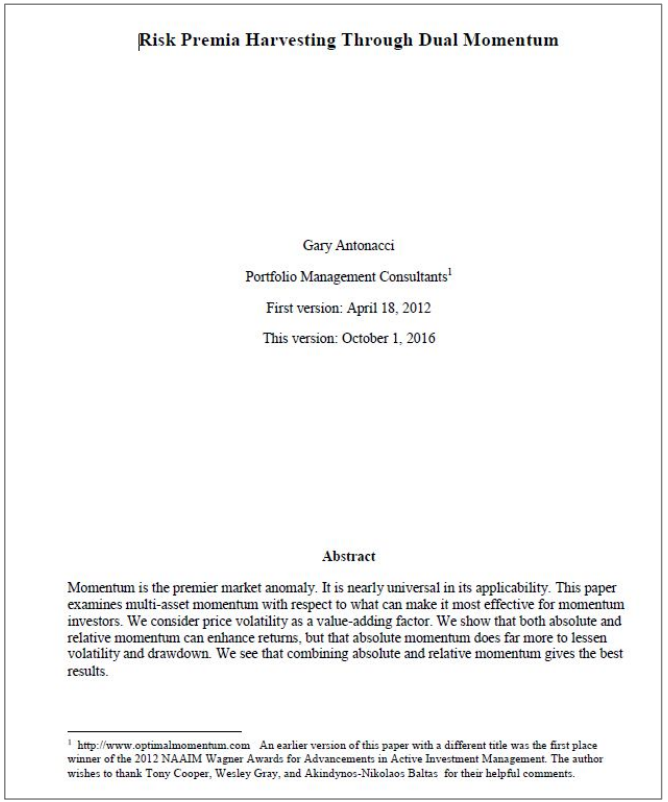


DUAL MOMENTUM

RISK PREMIA HARVESTING THROUGH DUAL MOMENTUM

"In our momentum match ups, we use a two-stage selection process. First, we choose between our module's non-Treasury bill assets using relative strength momentum. If our selected asset does not also show positive momentum with respect to Treasury bills (meaning it does not have positive absolute momentum), we select Treasury bills as an alternative proxy investment until our selected asset is stronger than Treasury bills. Treasury bill returns thus serve as both a hurdle rate before we can invest in other assets, as well as an alternative investment, until our assets can show both relative and absolute positive momentum."

https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2042750



Risk Premia Harvesting Through Dual Momentum

Gary Antonacci

Portfolio Management Consultants[1]

First version: April 18, 2012

This version: October 1, 2016

Abstract

Momentum is the premier market anomaly. It is nearly universal in its applicability. This paper examines multi-asset momentum with respect to what can make it most effective for momentum investors. We consider price volatility as a value-adding factor. We show that both absolute and relative momentum can enhance returns, but that absolute momentum does far more to lessen volatility and drawdown. We see that combining absolute and relative momentum gives the best results.

[1] http://www.optimalmomentum.com An earlier version of this paper with a different title was the first place winner of the 2012 NAAIM Wagner Awards for Advancements in Active Investment Management. The author wishes to thank Tony Cooper, Wesley Gray, and Akindynos-Nikolaos Baltas for their helpful comments.

COMPOSITE DUAL MOMENTUM
BASIC MODULE STRUCTURE

RISK PREMIA HARVESTING THROUGH DUAL MOMENTUM
Gary Antonacci Portfolio Management Consultants1; First version: April 18, 2012; This Version October 1, 2016

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2042750

BASIC STRATEGY RULES/ MODULES

The strategy divides the portfolio into four "modules", each targeted to a different component of financial markets: equities, credit risk, real estate, and stress. From each module, the strategy selects either one of two related asset classes, or cash. The four modules and their associated assets are as follows:

EQUITY MODULE - 25%: US Equities (represented by SPY) or International Equities (EFA)

CREDIT RISK MODULE - 25%: US Corporate Bonds (LQD) or US High Yield Bonds (HYG)

REAL ESTATE MODULE - 25%: Equity REITs (VNQ) or Mortgage REITs (REM)

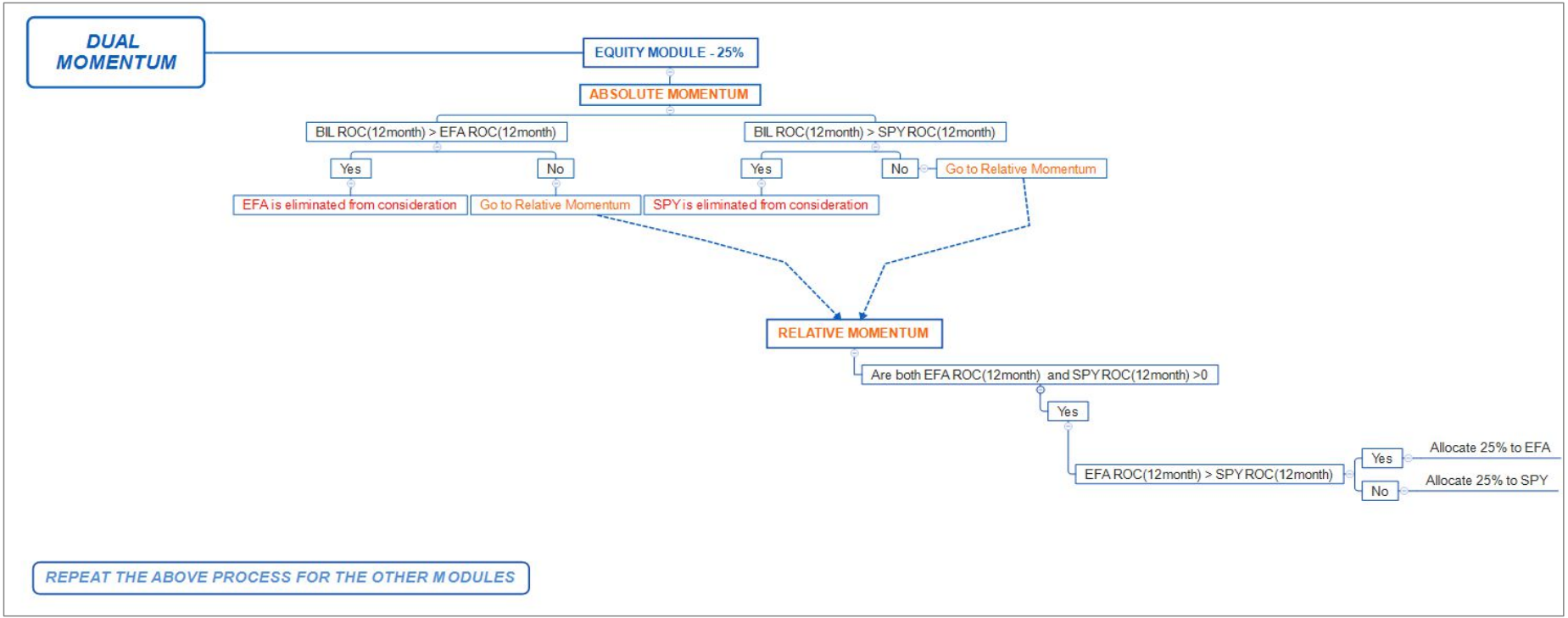
ECONOMIC STRESS MODULE - 25%: Gold (GLD) or Long-Term US Treasuries (TLT)



COMPOSITE DUAL MOMENTUM
STRATEGY MAP (EQUITY MODULE EXAMPLE)

RISK PREMIA HARVESTING THROUGH DUAL MOMENTUM
Gary Antonacci Portfolio Management Consultants1; First version: April 18, 2012; This Version October 1, 2016

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2042750



DUAL MOMENTUM
THE RESULTS

RISK PREMIA HARVESTING THROUGH DUAL MOMENTUM
Gary Antonacci Portfolio Management Consultants1; First version: April 18, 2012; This Version October 1, 2016

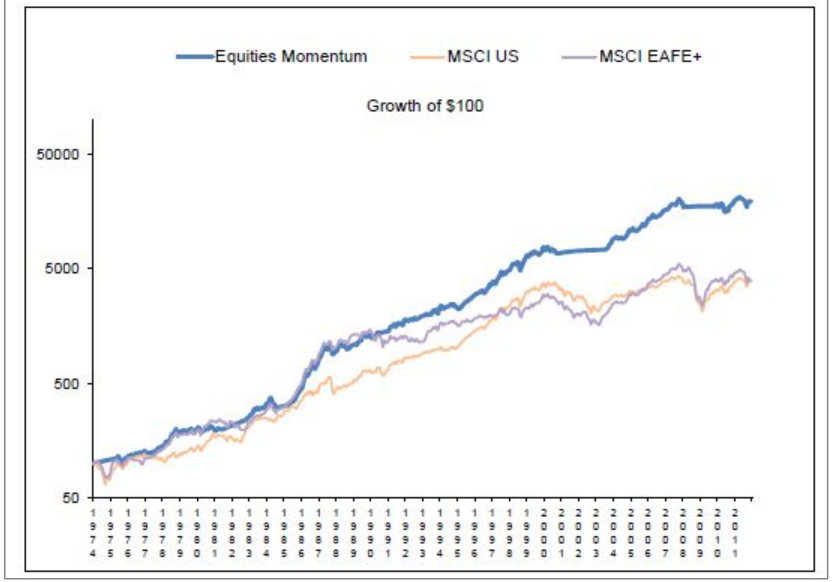
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2042750

EQUITY MODULE – DUAL MOMENTUM

Table 1 Equities Momentum 1974-2011

	Dual Momentum	Relative Momentum	US	EAFE+
Annual Return	15.79	13.46	11.49	11.86
Annual Std Dev	12.77	16.17	15.86	17.67
Annual Sharpe	.73	.45	.35	.33
Max Drawdown	-23.01	-54.56	-50.65	-57.37
% Profit Months	73	62	60	60
Trades/Year	1.4	1.2	-	-

Figure 1 Equities Dual Momentum 1974-2011



COMPOSITE DUAL MOMENTUM

THE RESULTS

ABSOLUTE MOMENTUM: A SIMPLE RULE-BASED STRATEGY AND UNIVERSAL TREND-FOLLOWING OVERLAY
Gary Antonacci Portfolio Management Consultants1, April 10, 2014

https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2244633

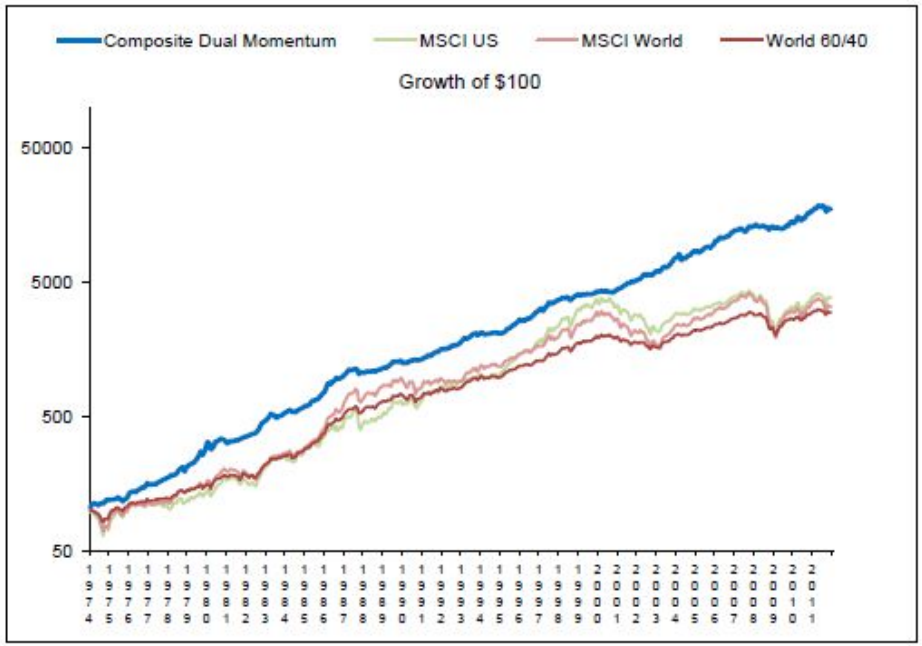
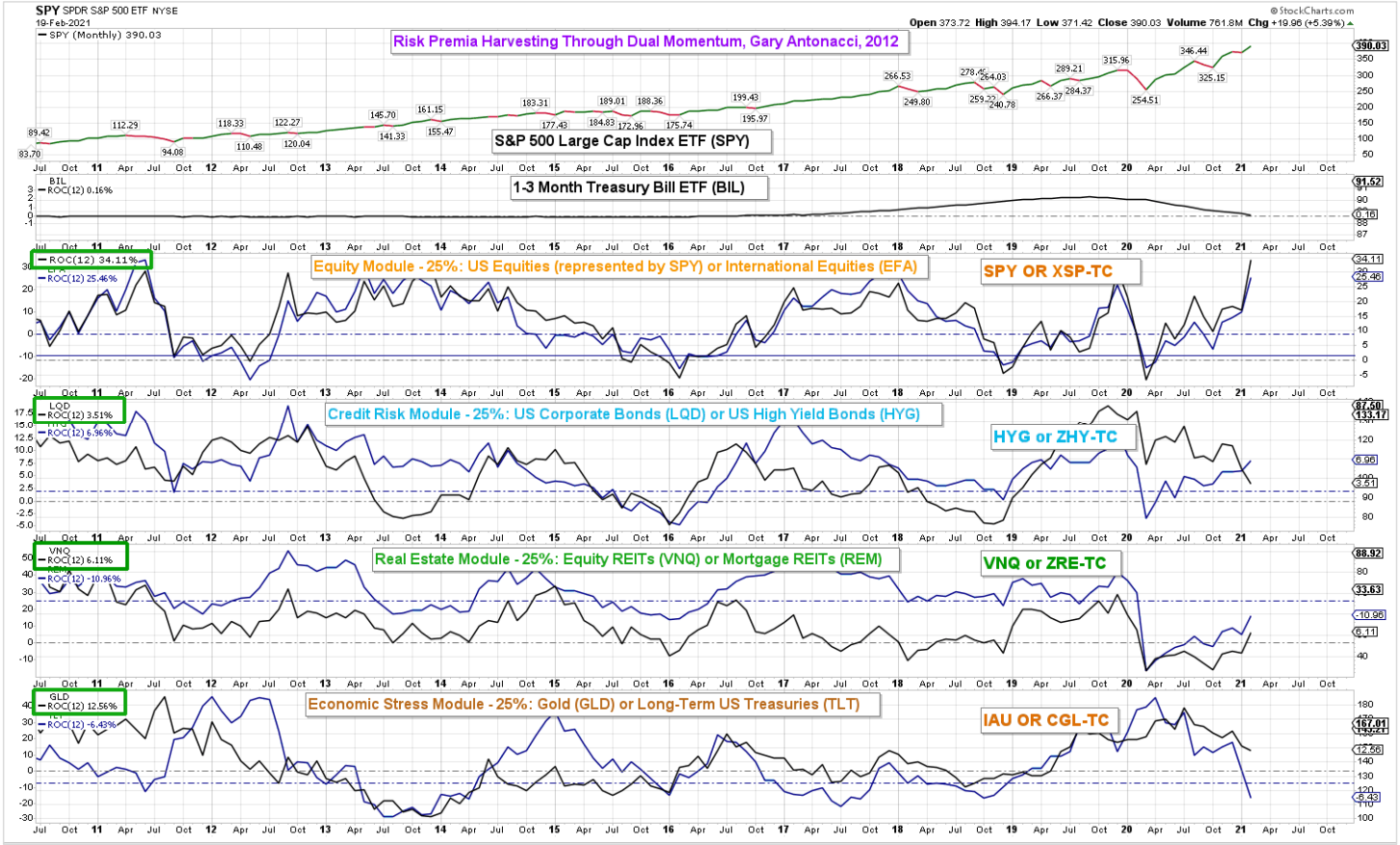


Table 10 Momentum Summary 1974-2011

	Annual Return	Annual Std Dev	Annual Sharpe	Maximum Drawdown	Skew	Kurtosis
Equities						
• US	11.49	15.86	.35	-50.65	-.38	4.83
• EAFE+	11.86	17.67	.33	-57.37	-.32	4.21
Credit Risk						
• High Yield	10.29	8.67	.51	-33.17	-.49	10.01
• Credit Bond	8.53	5.19	.54	-11.35	.45	9.53
REITs						
• Equity REIT	14.60	17.39	.48	-68.30	-.72	11.57
• Mortgage REIT	8.28	20.71	.13	-42.98	-.22	8.29
Economic Stress						
• Gold	9.22	20.00	.17	-61.78	.60	6.72
• Treasuries	9.90	10.54	.39	-20.08	.38	4.81
Momentum Modules						
• Equities	15.79	12.77	.73	-23.01	-.24	4.83
• Credit Risk	10.49	4.74	.97	-8.20	-.10	8.96
• REITs	16.78	13.24	.77	-23.74	-.75	8.33
• Economic Stress	16.65	17.04	.59	-24.78	.68	11.86
• Composite	14.93	7.99	1.07	-10.92	-.45	6.56

COMPOSITE DUAL MOMENTUM

STOCKCHARTS.COM TEMPLATE



DUAL MOMENTUM
ALSO WORKS ON FIXED INCOME?


DUAL MOMENTUM ™

Information and research review by Gary Antonacci

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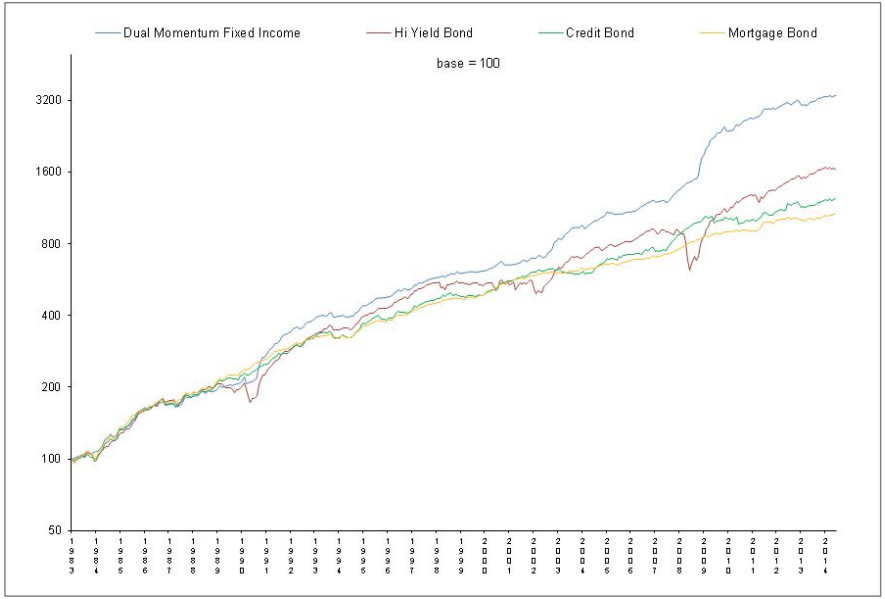
Dual Momentum Fixed Income

Posted by Gary Antonacci on December 23, 2014

https://www.dualmomentum.net/search?q=fixed+income&submit=Search

"Our Dual Momentum Fixed Income (DMFI) model switches monthly between the strongest one of the following indexes: Barclays Capital U.S. Credit Bonds, Barclays Capital U.S. Corporate High Yield Bonds, Barclays Capital U.S. Mortgage Backed Securities, and 90 day U.S. Treasury bills."

	HI YIELD	CREDIT	MBS	TBILLS	DMFI
Annual Return	9.8	8.6	7.9	4.1	12.0
Annual Std Dev	8.5	5.5	4.0	0.8	5.8
Sharpe Ratio	0.73	0.94	1.13	1.10	1.43
Max Drawdown	-33.3	-7.3	-7.8	0	-5.7
% of DMFI Profits	59	20	14	7	100
% of Occurrences	47	24	16	13	100
Avg Credit Rating	B	BBB	AAA	AAA	*
Avg Yrs Duration	4.5	7.1	0.3	0.3	*

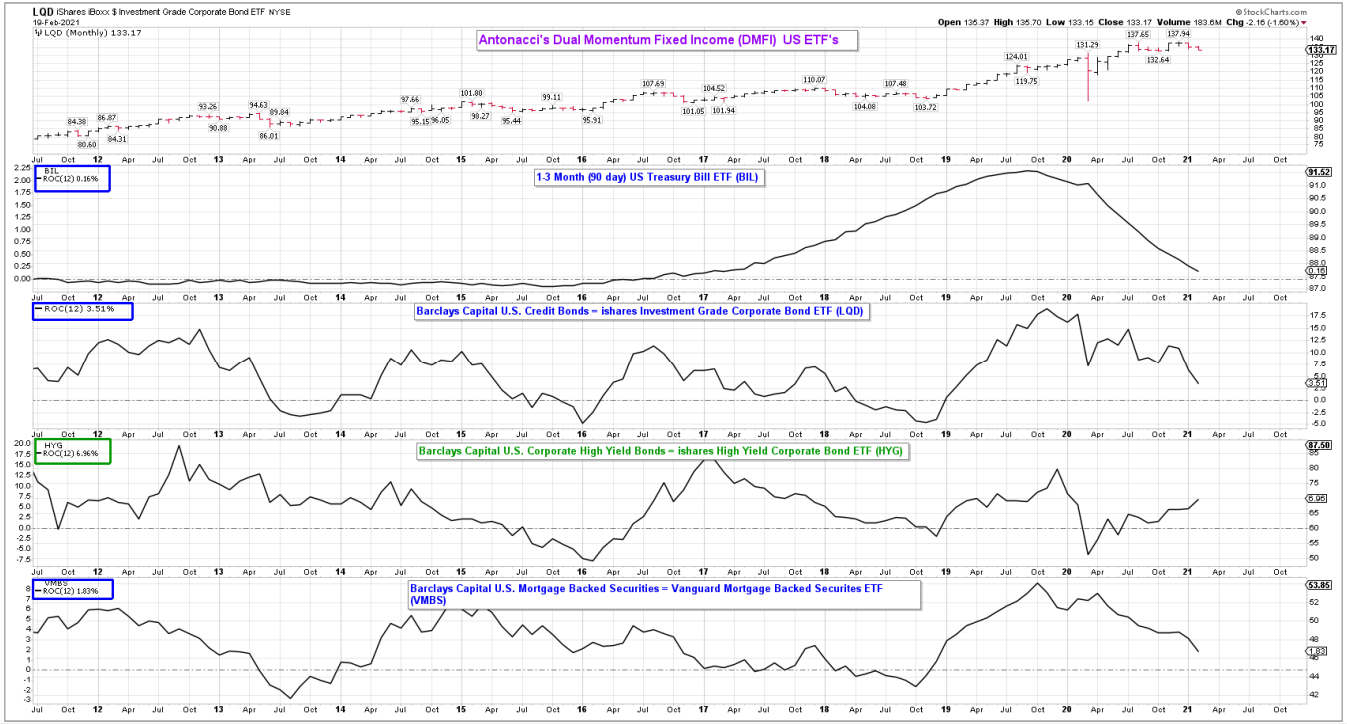


DUAL MOMENTUM

ALSO WORKS ON FIXED INCOME?

"Our Dual Momentum Fixed Income (DMFI) model switches monthly between the strongest one of the following indexes: Barclays Capital U.S. Credit Bonds, Barclays Capital U.S. Corporate High Yield Bonds, Barclays Capital U.S. Mortgage Backed Securities, and 90 day U.S. Treasury bills."

https://www.dualmomentum.net/search?q=fixed+income&submit=Search



DUAL MOMENTUM

NOVELL'S FIXED INCOME STRATEGY

Portfolio

A Trend Following Bond Portfolio For Any Environment

Paul.Novell@Gmail.Com / December 6, 2014

https://investingforaliving.us/2014/12/06/a-trend-following-bond-portfolio-for-any-environment/

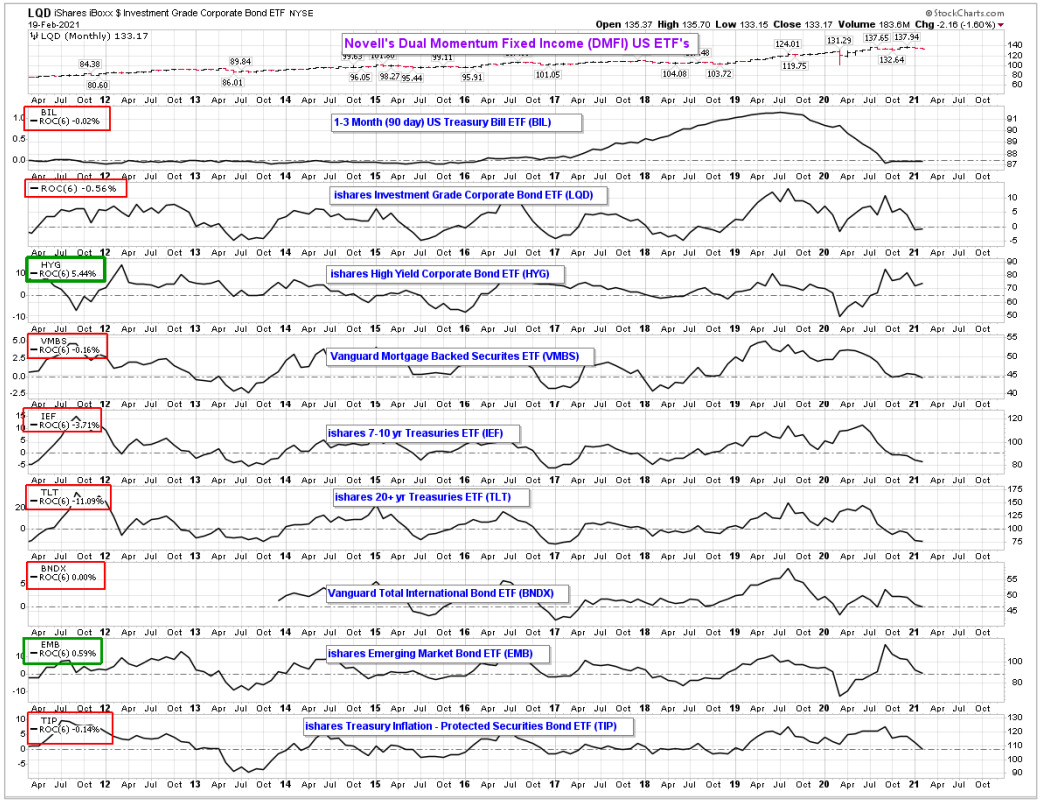
- ❖ 6 month look back;
- ❖ 8 Bond ETF's;
- ❖ Invest in the top three ETF's if the 6month return is greater than BIL;

2007-2014YTD	GBM Bond	GBM Bond 6mo	GTAA Bond 1	GTAA Bond 3
CAGR	7.55%	10.00%	10.32%	8.90%
Std Deviation	7.82%	8.82%	8.78%	5.20%
Max Daily Drawdown	-11.45%	-10.99%	-10.99%	-6.14%
Sharpe	0.58	0.79	0.83	1.12
Sortino	0.62	0.94	1.00	1.42

Strategy	2007	2008	2009	2010	2011	2012	2013	2014 YTD	CAGR
GTAA Bond 3	13.31%	4.76%	15.20%	7.50%	13.35%	7.60%	0.21%	9.83%	8.90%
GBM Bond	8.98%	4.61%	7.66%	15.98%	-3.60%	15.29%	5.28%	6.97%	7.55%
BND	5.45%	5.18%	6.03%	6.51%	7.71%	4.04%	-2.14%	5.20%	4.71%

As February 20, 2021, heading into March 2021 Novell's Bonds Strategy would have been invested as follows;
33% HYG, 33% EMB, 33% Cash

Next signal – February 26, 2021



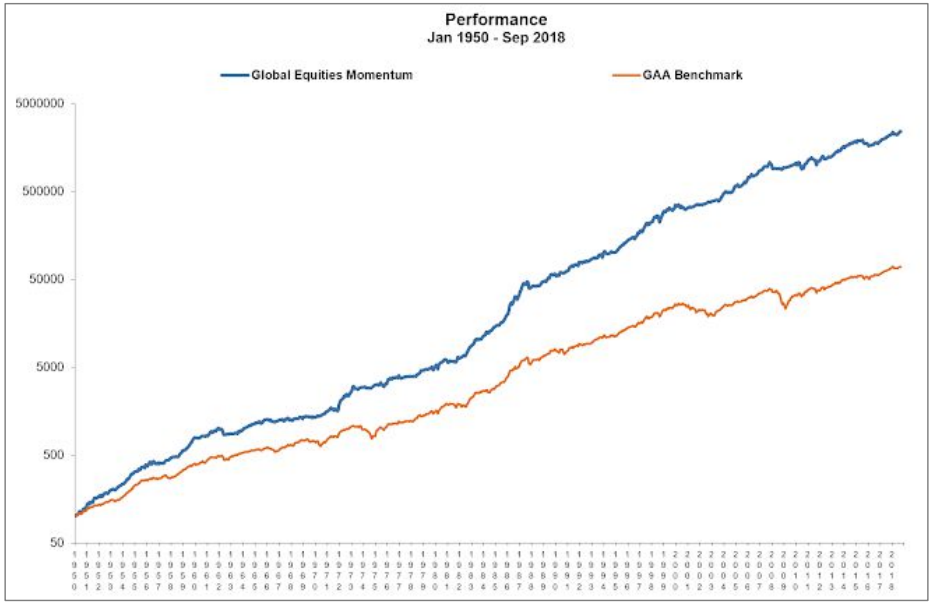
DUAL MOMENTUM

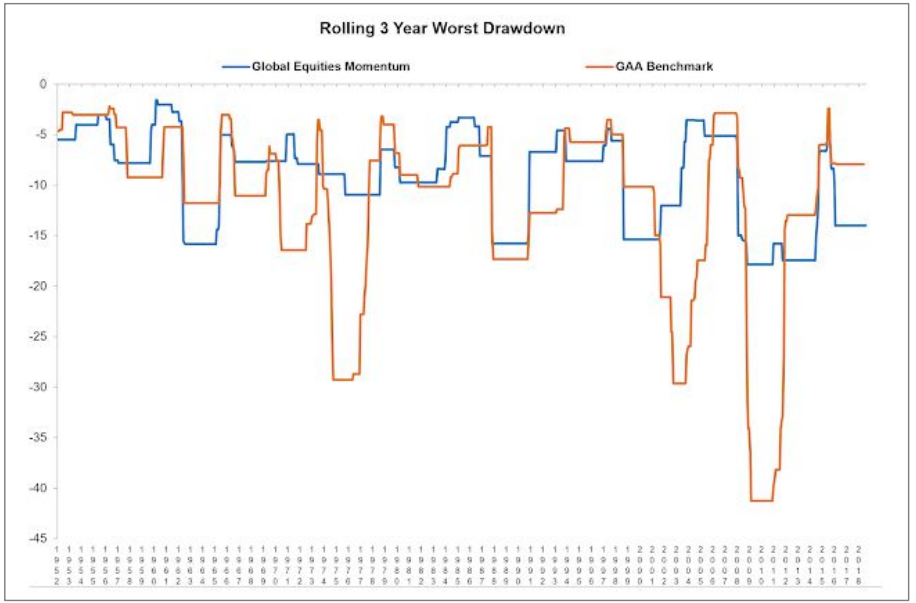
GLOBAL EQUITY MOMENTUM (GEM)

Extended Backtest of Global Equities Momentum

Posted by Gary Antonacci on October 16, 2018

https://www.dualmomentum.net/2018/





THIS STRATEGY ONLY USES THREE HIGHLY LIQUID ASSETS…….

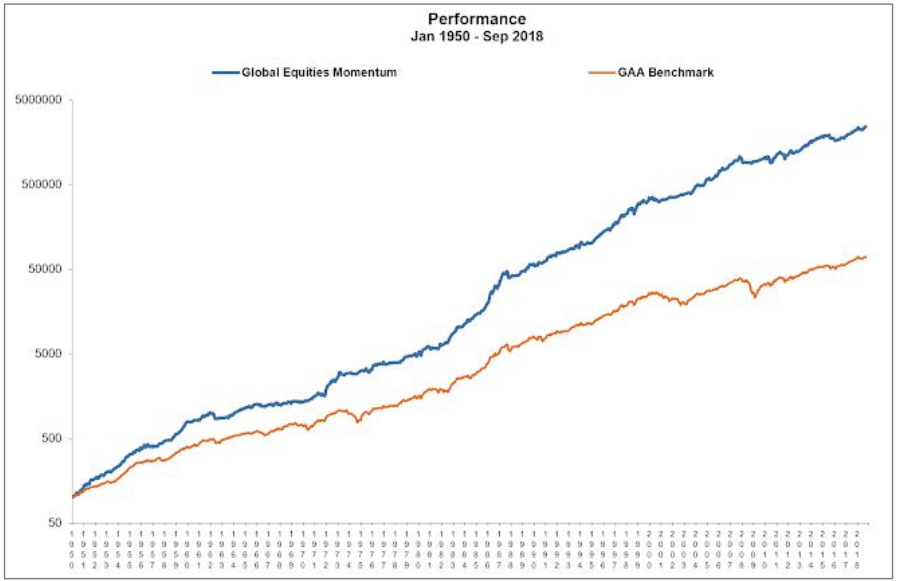
DUAL MOMENTUM

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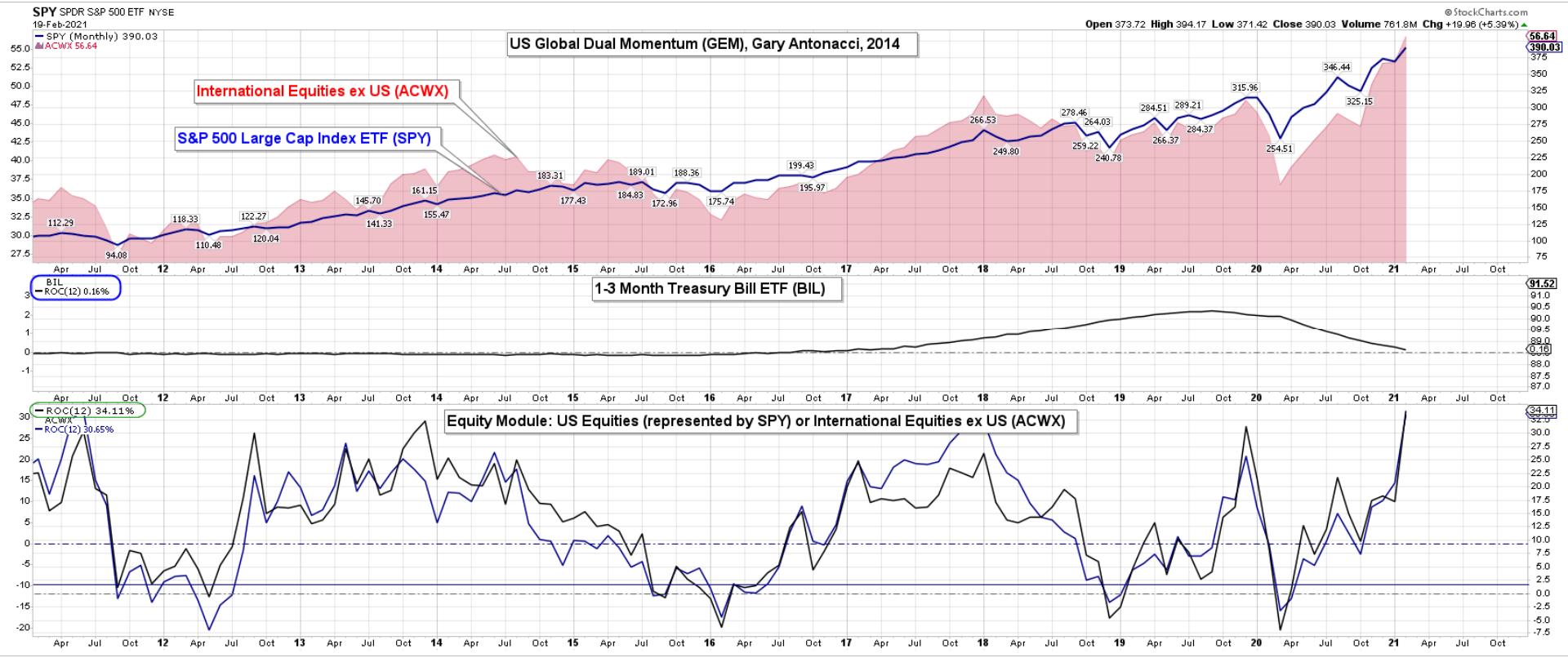
https://www.dualmomentum.net/2018/



	Jan 1950- Sep 2018		Jan 1950- Dec 1979		Jan 1980- Sep 2018	
	GEM	**GAA**	**GEM**	**GAA**	**GEM**	**GAA**
CAGR	15.8	10.0	13.9	9.6	17.3	10.3
Annual Std Dev	11.5	9.8	10.2	8.3	12.4	10.9
Skewness	-0.09	-0.54	0.30	-0.24	-0.29	-0.63
Sharpe Ratio	0.96	0.57	0.72	0.39	1.03	0.58
Worst Drawdown	-17.8	-41.2	-15.8	-29.3	-17.8	-41.2
Worst 6 Months	-15.7	-33.0	-15.7	-21.0	-15.0	-33.0
Worst 12 Months	-17.8	-35.7	-13.3	-28.1	-17.8	-35.7
% of Profit Months	69	67	67	68	72	63

DUAL MOMENTUM

GLOBAL EQUITY MOMENTUM (GEM)



DUAL MOMENTUM
FOR NON-US INVESTORS

Dual Momentum for non-US Investors

Posted by Gary Antonacci on June 02, 2015

https://www.dualmomentum.net/2015/06/dual-momentum-for-non-us-investors.html

CASE	Description
1	Foreign investors (Canadian, Australian, British and Japanese) trade on the US stock exchange when GEM is in equities and on their local stock exchange when GEM is in bonds. When in bonds, investors hold either their local country's aggregate bond index or a currency-hedged version of US Aggregate Bond Index. *The importance of this bond strategy will be seen in the results for Case 4.* Foreign investors do the GEM analysis in USD while the transactions are done in their local currency. *The importance of doing the analysis in USD will be seen in the results for Case 2.* Like the version of GEM described in Gary's book, we will use the S&P 500, MSCI ACWI ex-USA and Barclay's US Aggregate Bond Index. *The importance of using these indices, particularly ACWI ex-US, will be seen in the results for Case 3.* Results for each of the 4 foreign investors are compared with those of an American GEM investor. Finally, we will also show what happens when the foreign investor trades permanently on their local stock exchange using currency-hedged ETFs for all (equity and bond) trades. Note: Results for this fully currency-hedged version of GEM will be the same for all foreign investors, regardless of their country.
2	Same as the base case, except the analysis is also done in the foreign investor's local currency in addition to transactions.
3	Foreign investors have their portfolio permanently on their own local stock exchange. When GEM is in stocks, investors would use unhedged ETFs. When GEM is in bonds, investors would use either their local country's aggregate bond index or a currency-hedged version of US Aggregate Bond Index. Because foreign investors will likely not have access to an ETF tracking the ACWI ex-USA index on their local stock exchange, we will instead use the MSCI USA and MSCI EAFE equity indices. This change in indices is really the only consequential difference between this case and the base case.
4	Foreign investors have their portfolio permanently on the US stock exchange. Everything is the same as the base case, except when investors are in bonds, they are in an unhedged US Aggregate Bond Index and therefore exposed to the US dollar.

"More specifically, I want to explore how the following decisions affect GEM performance:

1) GEM analysis done in US dollars versus the investor's local currency
2) Hedged versus unhedged ETFs for execution
3) Alternate stock indices to the S&P 500 and the MSCI ACWI ex-US
4) Trades performed on local stock exchanges versus the US exchange

	GEM (USD)	GEM (CAD)	GEM (AUD)	GEM (GBP)	GEM (JPY)
Compound Annual Return	15.3%	16.1%	19.8%	16.5%	13.3%
Average Annual Return	16.3%	17.2%	22.3%	17.8%	14.4%
% Positive Years	91%	88%	81%	81%	77%
Worst Year	-17.9%	-12.7%	-16.0%	-10.6%	-16.6%
Std Dev of Annual Return	13.3%	12.4%	17.8%	14.4%	14.9%
Sharpe Ratio	0.85	0.98	0.98	0.89	0.63

	GEM (USD)	GEM (CAD)	GEM (AUD)	GEM (GBP)	GEM (JPY)
Compound Annual Return	17.4%	17.8%	22.2%	18.8%	14.8%
Average Annual Return	18.3%	18.8%	24.8%	20.2%	16.3%
% Positive Years	93%	91%	86%	81%	79%
Worst Year	-8.2%	-6.2%	-14.6%	-10.1%	-23.7%
Std Dev of Annual Return	13.3%	12.6%	17.9%	14.8%	15.8%
Sharpe Ratio	1.00	1.09	1.10	1.03	0.71

This study is meant to further the research that Gary has presented and help non-US investors to implement GEM correctly"

DUAL MOMENTUM

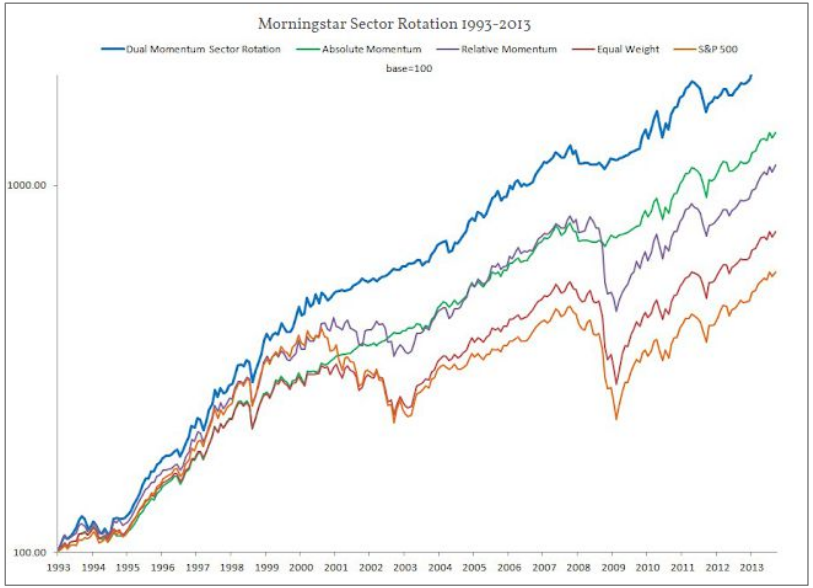
DOES IT WORK ON SECTORS?

ADDING COMPLEXITY SOMETIMES DOES NOT IMPROVE PERFORMANCE

Sector Rotation and Dual Momentum

Posted by Gary Antonacci on May 18, 2013

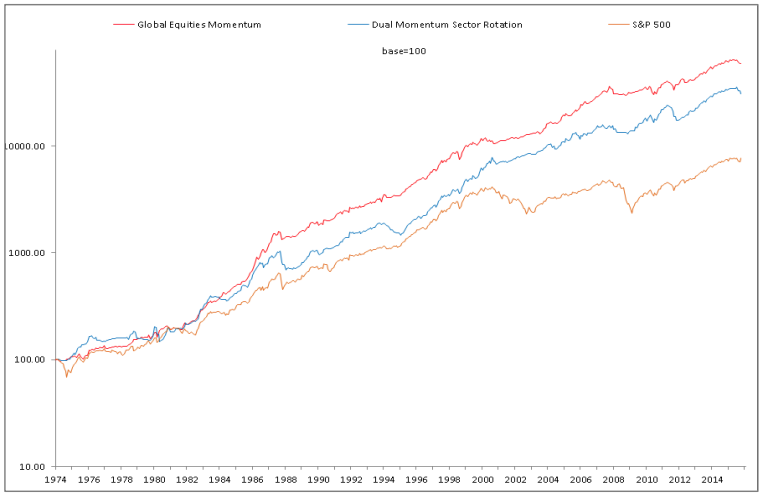
https://www.dualmomentum.net/2013/05/sector-rotation-and-dual-momentum.html



Bring More Data

Posted by Gary Antonacci on November 21, 2015

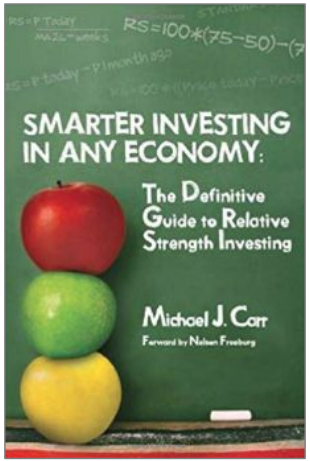
https://www.dualmomentum.net/2015/11/bring-more-data.html

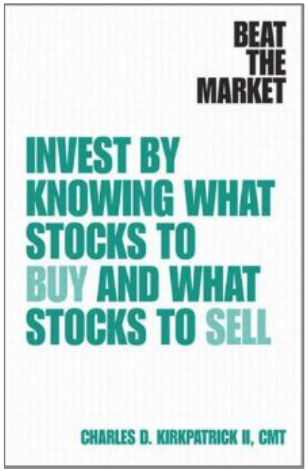


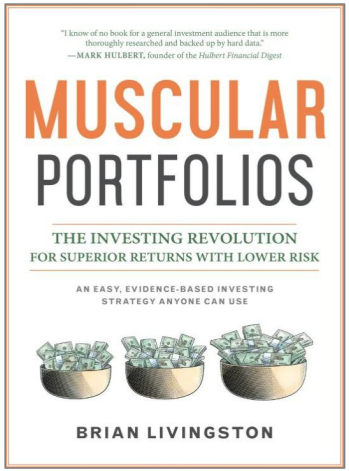
	GEM	DMSR	S&P 500
Average Annual Return	17.36	15.86	12.21
Standard Deviation	12.32	14.55	15.43
Sharpe Ratio	0.89	0.67	0.42
Maximum Drawdown	-17.84	-33.96	-50.95

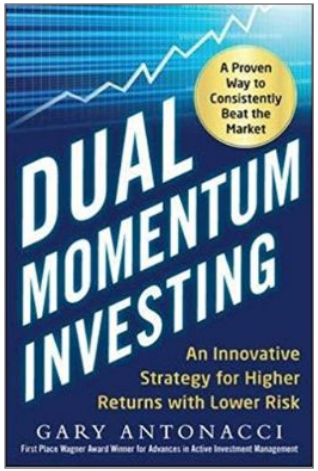
RELATIVE STRENGTH AND MOMENTUM REFERENCES

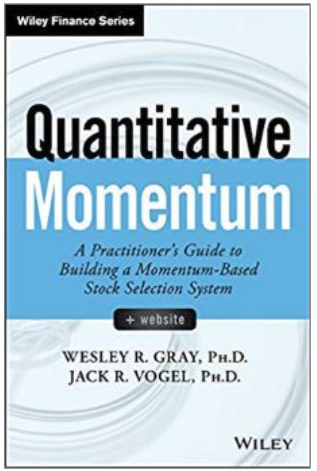
TIM'S RECOMMENDATIONS











THAT'S IT FOR TODAY!



RIVERSIDE'S INVESTOR MASTER CLASS

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John P. Hussman, Ph.D
President, Hussman Strategic Advisors