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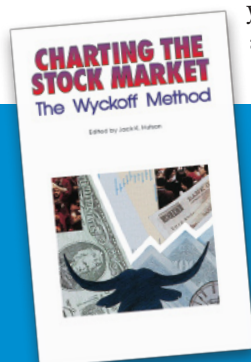
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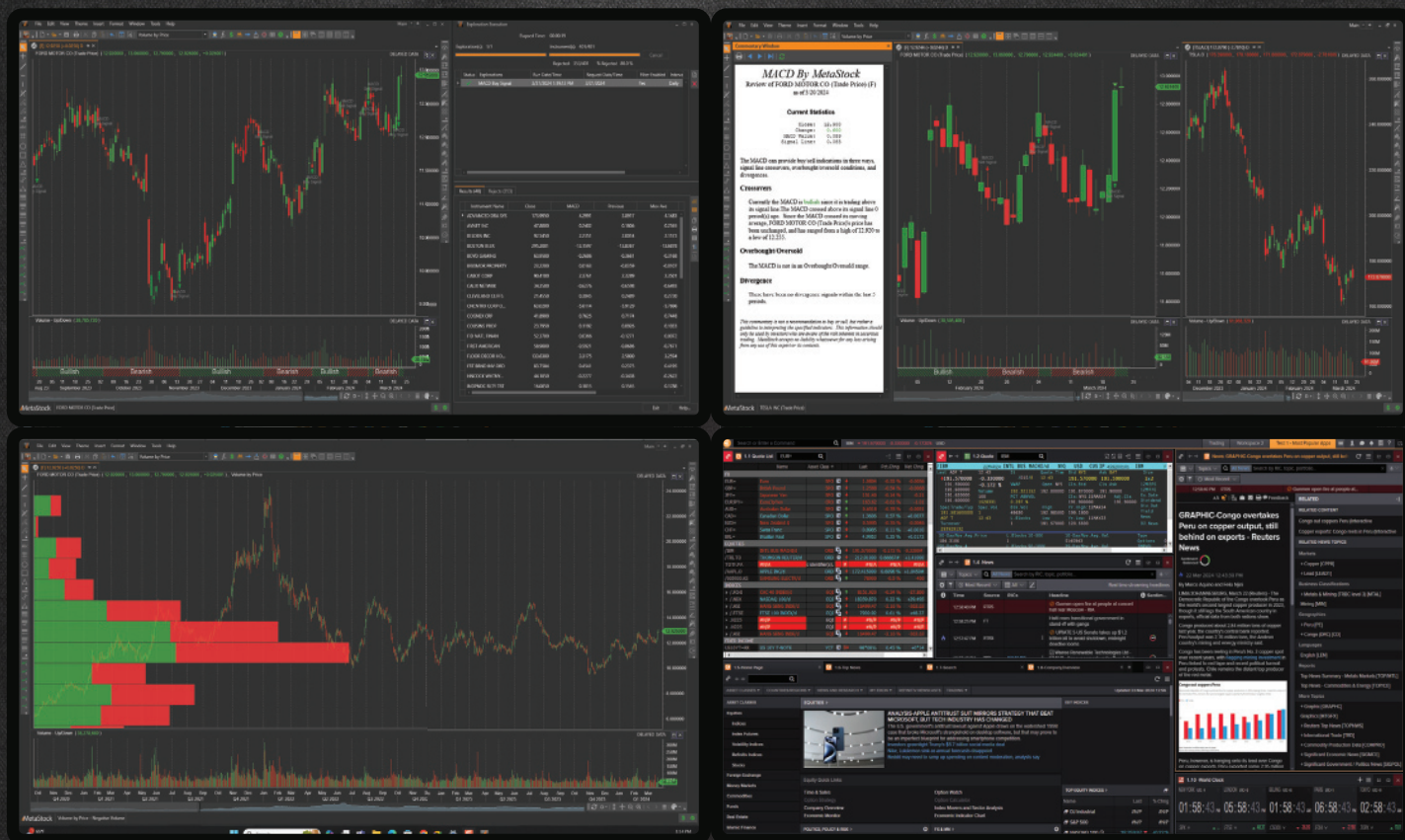
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editor@traders.com

Editor in Chief Jack K. Hutson

Production Manager Karen E. Wasserman

Graphic Designer Wayne Shaw

Webmaster Han J. Kim

Contributing Editors John Ehlers,
Anthony W. Warren, PhD.

Contributing Writers Thomas Bulkowski, Martin
Pring, Barbara Star, Markos Katsanos, Leslie N.
Masonson

OFFICE OF THE PUBLISHER

Publisher Jack K. Hutson

Industrial Engineer Jason K. Hutson

Project Engineer Sean M. Moore

ADVERTISING SALES

4757 California Ave. S.W.

Seattle, WA 98116-4499

206 660-8577 Fax 206 938-1307

advert@traders.com

National Sales Manager Edward W. Schramm
ESchramm@traders.com

CIRCULATION

Subscription & Order Service 1 800 832-4642

1 206 938-0570 Fax 1 206 938-1307

circ@traders.com

Subscription Manager Sean M. Moore

WEBSITE

http://www.traders.com

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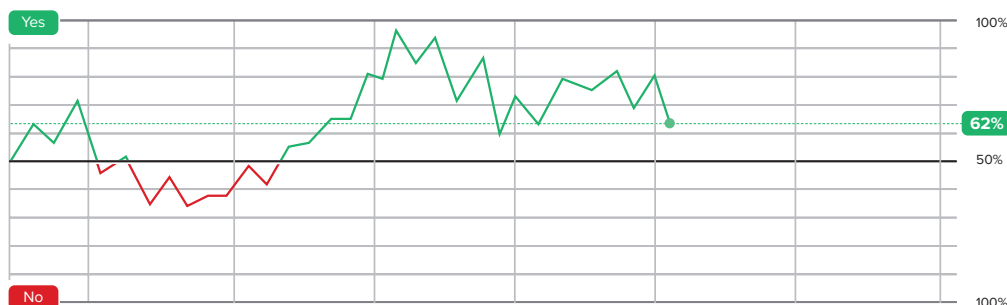
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INSIDE THE FUTURES WORLD

Want to find out how the futures markets really work? Carley Garner is the senior strategist for DeCarley Trading, a division of Zaner, where she also works as a broker. She has written five books on futures and options trading, with the latest being Trading Commodity Options...With Creativity (July 2020), as well as A Trader's First Book On Commodities (third edition, October 2017) and Higher Probability Commodity Trading (July 2016). Garner also authors widely distributed e-newsletters; for a free subscription, visit www.DeCarleyTrading.com. To submit a question, email her at info@carleygarnertrading.com or via www.DeCarleyTrading.com. Selected questions will appear in a future issue of S&C.



Carley Garner

PORTFOLIO ALLOCATION

What percentage of a portfolio should be allocated to commodities?

Plenty of studies suggest that the commodity sector offers long-term investment portfolios a diversification vehicle, but I believe this is misleading. For starters, the term “commodities” is broad and can describe anything from a balanced commodity index to a highly leveraged managed futures program or even self-directed speculation. Obviously, the latter would likely make an overall portfolio riskier rather than the desired result of less risk.

On the other hand, a typical commodity index has cycles of stunning performance followed by hideous and painful declines. Thus, it is probably counterproductive to simply allocate funds to a commodity index because, in the long run, commodities trade sideways. Further, it is naïve to assume it is appropriate to treat all commodities the same. For instance, the same strategy, timing, and aggression used for precious metals allocations shouldn't be applied to agricultural products or energies.

I'm going to point out the obvious because I've come across quite a few individuals who incorrectly categorize high-leveraged speculation in a futures account with portfolio diversification. The harsh reality is that most futures speculators lose

money; thus, any funds deposited in such an account for trading (not investing) should be risk capital. Further, it should not be considered a productive part of a portfolio unless the trading is done in an experienced and, at least partially, de-leveraged manner. Even so, it should always be risk capital just in case something goes wrong. It is clear that speculating, particularly with excessive leverage and aggression, is not what the research papers talked about regarding the enhanced portfolio diversification offered by allocating commodities.

Those wishing to allocate commodities to their portfolio as a diversifier, not an attempted enhancer, will likely discover it requires more legwork than expected.

You might ask yourself, “What is the solution?” which is a valid question. Unfortunately, I think the answer is more complicated than most believe. Most investors are seeking black-and-white answers, simplicity, and understandable math, but that doesn't necessarily exist in the real world. Plenty of commodity-based

ETFs (electronically traded funds) pool investor money and use it to purchase futures contracts; such ETFs appear to be convenient ways to gain access to commodity exposure. However, they are wildly inefficient and often ineffective because they exaggerate disadvantages such as contango. Further, due to rebalancing obstacles, they often don't follow the performance of the underlying commodity.

Those wishing to allocate commodities to their portfolio as a diversifier, not an attempted enhancer, will likely discover it requires more legwork than expected. The least hands-on approach would be to find a CTA (Commodity Trading Advisor) with a lengthy live trading track record. The goal wouldn't be to find the fund with the highest returns because those are likely programs that swing for the fence. Yet, it must be understood that allocation to a CTA comes with high administrative costs that create such a drag on performance; there might not be much left if the trading strategy is one with a goal of slow and steady profits.

Algorithmic futures trading programs might be appropriate, but these systems generally go both long and short commodities while utilizing at least some, but maybe excessive, leverage, so any money put in such a system should be assumed to be excessively risky. More importantly, it

Regardless of the approach, commodities aren't for sissies.

should only be done with ample risk consideration and proper funding to reduce leverage.

The more practical but far more challenging solution to a commodity portfolio diversifier would be to practice a long-only bottom-feeder strategy in a well-funded account. For instance, have an open and funded trading account to take advantage of rare significant commodity market dips using long-term "buy and hold" strategies. For example, being a "buyer" of crude oil in the \$30.00s has generally been a good idea. Similarly, getting long natural gas in the \$2.00s, and corn near \$3.00 has historically been favorable for patient bulls. This type of approach is still categorized as speculation, and unless the account is funded with the full contract value of the commodity traded, it will have some leverage, but it achieves the overall goal of diversifying a portfolio with reasonable expectations of positive returns at a relatively low cost. However, doing so requires patience, sufficient working capital, and likely help from a professional. In other words, it is easier said than done.

Unfortunately, most people attempt to take the easier or more exciting routes and find they have not decreased portfolio volatility but instead have increased it and decimated performance. Others find they spend a lot of money in fees to achieve the same or less benefit of purchasing a T-bill. Regardless of the approach, commodities aren't for sissies.

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Getting More Value From The Classic ADX & DMI

Revisualizing The ADX Oscillator

Introducing a new, re-envisioned ADX that provides more information to the trader and makes ADX readings more intuitive and easier to visualize. Find out how to create and use it.



Welles Wilder Jr.'s 1978 book *New Concepts In Technical Trading Systems* was a seminal work. That one book introduced us to the directional movement index (DMI+, DMI-), the average directional index (ADX), the average true range (ATR), the relative strength index (RSI), the parabolic stop & reverse (PSAR), and more.

The ADX, DMI+, and DMI- indicators contain useful information, but sometimes they are misunderstood or misapplied.

In this article, first, I'll briefly review the ADX and DMI and their traditional presentation. Then I will introduce the new version of the ADX oscillator I developed as a way to more intuitively visualize the information that Wilder's calculations provide.

Just to note it, in my own work and in my charts, I call my new oscillator the "Harrington ADX Oscillator." But for the purposes of this article, it will be referred to descriptively as the dynamic ADX histogram.

In my new oscillator, a smoothing length is added to the DMI to lessen some noisy whipsaws. Then, low and high threshold levels are added to the oscillator to delineate five levels of trend strength and direction.

THE CLASSIC VERSIONS OF ADX, DMI+, DMI-

For details on how the classic ADX and DMI are constructed and used, you can refer to Wilder's 1978 book or you can refer one of several articles in this magazine's archives at Traders.com. (See "Further reading" at the end for some references. And if you're

interested, you can also read an earlier article I wrote for this magazine, "The Link Between Bollinger Bands And The Commodity Channel Index (CCI)," which also can be found in this magazine's article archives at Traders.com.)

Suffice it to say here, DMI+ is a measure of positive price movement, DMI- is a measure of negative price movement, and ADX is a measure of trend strength. ADX tells you the trend strength but not trend direction. The relative position of DMI+ and DMI- reveal the direction.

Figure 1 shows an example of these three classic indicators. ADX is the dark orange line, DMI+ is the dark green line, and DMI- is the dark red line.

Trend direction is gauged by the relative position of DMI+ and DMI-. When DMI+ is on top, the trend is up. When DMI- is on top, the trend is down.

The magnitude of the ADX line shows the trend strength. The slope of the ADX line shows whether strength is building or weakening.

A horizontal threshold line indicates a level between trending and nontrending market action.

These are the traditional interpretations. As a technical analyst, you determine what meaning you find from the information, and at what levels.

Wilder used a default lookback length of 14 and a threshold of 25 to indicate a trending market.

In the examples in this article, a lookback length of 10 and a lower threshold of 15 are used because I find them more responsive to the patterns in today's market.

Wilder used a 14-period lookback in many of his indicators because he analyzed daily bars, and 14 days is half a lunar cycle (28 days). Wilder paid attention to lunar cycles in his technical analysis. I do not.

by Neil Jon Harrington

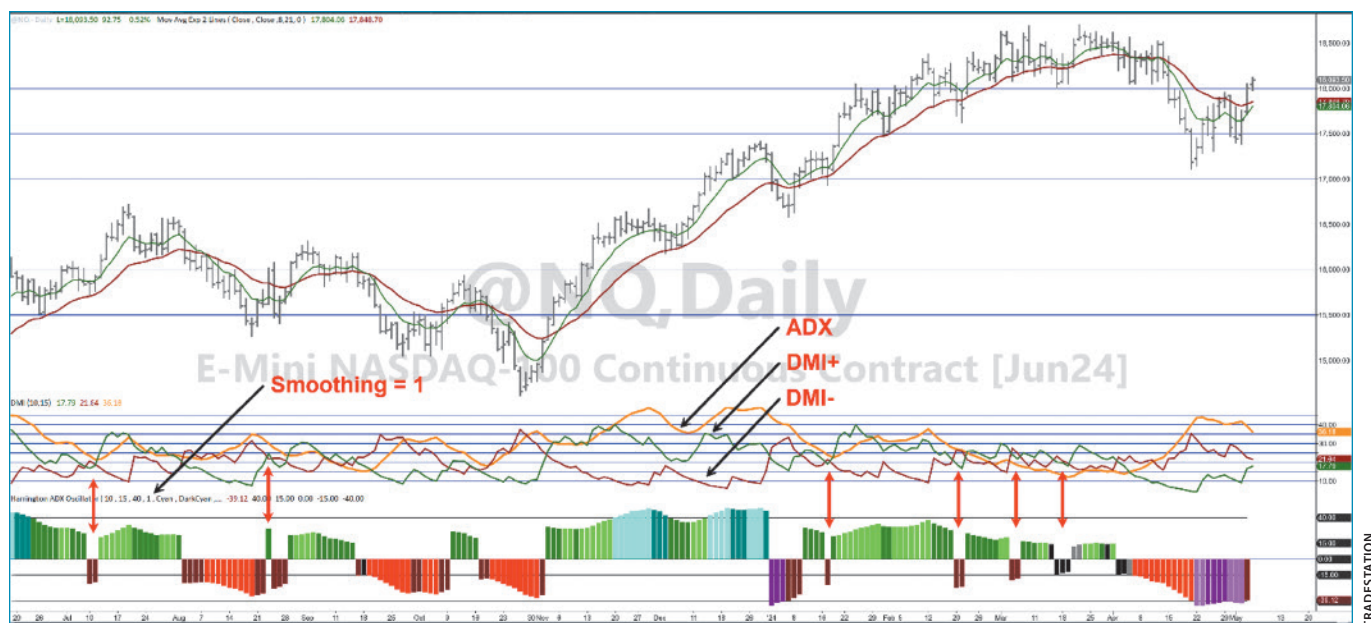


FIGURE 1: TRADITIONAL ADX VS. THE NEW DYNAMIC ADX HISTOGRAM. Here you can see the classic versions of the ADX and DMI in the middle pane, and in the bottom subpane, you see the new reenvisioned ADX oscillator, labeled “Harrington ADX Oscillator,” which is a color-coded histogram with an adjustable smoothing parameter. In this example, which uses the NASDAQ continuous futures contract (@NQ), the smoothing length is set to 1 for the new oscillator. With this minimal setting, the new oscillator contains the same amount of noise as the traditional ADX and DMI do. (See Figure 2 to compare a different setting.)

PROBLEMS WITH THE STANDARD VISUALIZATION

Figure 1 shows the traditional display of ADX, DMI+, and DMI– (middle pane), using three colored lines. For me and others, this is a nonintuitive representation of the information.

ADX indicates trend strength but not direction. When it is sloping up, it indicates the trend is strengthening but does not indicate which direction.

People often glance at the ADX line and misinterpret the upslope as an uptrend instead of as increasing trend strength, and the downslope as a downtrend. This is a mistake.

To see the trend direction, you must look at the relative positions of DMI+ and DMI–. The one on top shows the direction. DMI+ on top shows an uptrend. DMI– on top shows a downtrend.

DMI+ and DMI– are also noisy, creating jagged, spiky lines that can briefly cross, creating whipsaws of short-lived up and down “trends.”

A NEW, REVISED OSCILLATOR: THE DYNAMIC ADX HISTOGRAM

I have created a new oscillator based on the ADX concept. My version of the oscillator addresses the issues of noisiness and the difficulty in correctly reading the nonintuitive display of the classic ADX. I also added positive and negative low and high threshold horizontal lines to identify five trend zones, as follows:

- 1. Exhaustion high area:** Above the positive high threshold line
- 2. Trending up:** Between the positive low threshold and positive high threshold lines
- 3. Nontrending:** Between the positive low threshold and negative low threshold lines
- 4. Trending down:** Between the negative low threshold and negative high threshold lines
- 5. Exhaustion low area:** Below the negative high threshold line

My oscillator revisualizes the ADX as a color-coded histogram, plotted above or below the zero line to see the price trend direction easily. The magnitude of the histogram is the trend strength. Brighter colors indicate trend strengthening, while darker colors indicate trend weakening.

DMI+ and DMI– are represented indirectly, but more intuitively, being combined and built into the histogram.

I will introduce a new version of the ADX oscillator I developed as a way to more intuitively visualize the information that Wilder’s calculations provide.



FIGURE 2: SMOOTHING THRESHOLDS TO INDICATE TREND STRENGTH AND DIRECTION. Low and high threshold levels in the new, dynamic histogram version of the ADX (bottom pane) delineate five levels of trend strength and direction. In the histogram, brighter colors indicate trend strengthening, while darker colors indicate trend weakening. With the smoothing length now set to 5 as seen here (in Figure 1, it was set to 1), the dynamic ADX histogram contains less noise than the traditional ADX. The red arrows show where whipsaws are eliminated, and the blue arrows show where the smoothing delays the signal.

THRESHOLDS FOR SMOOTHING

To minimize the noise in the DMIs, I added a smoothing length to the DMIs. With the smoothing length set to 1, there is no smoothing, and you will see the same noise present in the original indicator in Figure 1.

However, with the smoothing length set to 5 (see Figure 2), for example, you can see how the noise is diminished. But as with all smoothing, it introduces a delay, manifesting as a shift to the right.

It is up to the user, and to testing, to determine the most effective setting for the smoothing length. You now have that added control of information.

The low threshold is the lowest acceptable value to indicate a trending versus nontrending environment. The high threshold indicates a point above which the trend is so strong that it is likely to consolidate or reverse. This would indicate a good place to either tighten stops or take profit.

NEW AND BETTER INFORMATION

The histogram coloring allows you to easily see when the trend is up or down, when it is increasing or decreasing,

and what threshold level it is in.

This new oscillator provides a better, more intuitive view of the information available in Wilder's calculations. It also provides some new information potentially useful to the analyst.

WHAT TO DO NOW?

In the sidebar "Code For The Dynamic ADX Histogram, In EasyLanguage," I provide some coding for calculating and plotting my new ADX oscillator so you can try it yourself.

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My oscillator revisualizes the ADX as a color-coded histogram.

CODE FOR THE DYNAMIC ADX HISTOGRAM, IN EASLANGUAGE

```
{ *****
INDICATOR: Harrington ADX Oscillator
Description: Display the ADX and DMI information as a
histogram above or below zero.
The color reflects the direction, slope, and location of the
ADX.
The histogram is above zero when DMI+ > DMI-, and vice
versa.
Tradeable when the ADX is above/below the Low Threshold
and
sloping in the direction of the Trend.
Created: 2021-04-30
Last Edit: 2024-05-04
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*****}
INPUTS: ADXLength (10),
ADXLowThreshold (15),
ADXHighThreshold (40),
ADXSmoothLength (1),
OBUpColor (Cyan),
OBWeakUpColor (DarkCyan),
UpColor (Green),
WeakUpColor (DarkGreen),
NeutralUpColor (DarkGray),
NeutralDownColor (Black),
WeakDownColor (DarkRed),
DownColor (Red),
OSWeakDownColor (DarkMagenta),
OSDownColor (Magenta)
;

VARIABLES: oDMIPlus (0),
oDMIMinus (0),
oDMI (0),
oADX (0),
oADXR (0),
oVolty (0),
NegativeADX (0),
SmoothedPlus (0),
SmoothedMinus (0),
NetDMI (0),
ADXColor (White),
TrendColor (White)
;

Value1 = DirMovement(H,L,C,ADXLength,oDMIPlus,oD
MIMinus,oDMI,oADX,oADXR,oVolty);

NegativeADX = -oADX;
SmoothedPlus = Average(oDMIPlus, ADXSmooth-
Length);
SmoothedMinus = Average(oDMIMinus, ADXSmooth-
Length);
NetDMI = SmoothedPlus - SmoothedMinus;

IF oADX > oADX[1] THEN ADXColor = NeutralUpColor;
IF oADX < oADX[1] THEN ADXColor = NeutralDownColor;

SWITCH NetDMI BEGIN
CASE >= 0 :
IF (oADX >= ADXHighThreshold)
THEN BEGIN
IF (oADX > oADX[1]) THEN ADXColor = OBUpColor;
IF (oADX < oADX[1]) THEN ADXColor = OBWeakUpColor;
END;
IF (oADX >= ADXLowThreshold)
AND (oADX <= ADXHighThreshold)
THEN BEGIN
IF (oADX > oADX[1]) THEN ADXColor = UpColor;
IF (oADX < oADX[1]) THEN ADXColor = WeakUpColor;
END;

Plot1 (oADX,"AD XO", ADXColor);

CASE < 0 :
IF (oADX >= ADXHighThreshold)
THEN BEGIN
IF (oADX > oADX[1]) THEN ADXColor = OSDownColor;
IF (oADX < oADX[1]) THEN ADXColor = OSWeakDownColor;
END;
IF (oADX >= ADXLowThreshold)
AND (oADX <= ADXHighThreshold)
THEN BEGIN
IF (oADX > oADX[1]) THEN ADXColor = DownColor;
IF (oADX < oADX[1]) THEN ADXColor = WeakDownColor;
END;

Plot1 (NegativeADX,"AD XO",ADXColor);
END; // Switch NetDMI

Plot2 (ADXHighThreshold, "HiThresh");
Plot3 (ADXLowThreshold, "LoThresh");
Plot4 (0, "Zero");
Plot5 (-ADXLowThreshold, "-LoThresh");
Plot6 (-ADXHighThreshold, "-HiThresh");
```



Low and high threshold levels are added to the oscillator to delineate five levels of trend strength and direction.

That way, you can visually compare the traditional ADX displayed in three lines versus my color-coded dynamic ADX histogram, and then make your judgment as to which you would prefer to use—based on which indicator is more intuitive as well as which displays more information that is useful for your trading decisions.

You will likely agree that this new visualization of

Continued on page 29

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Taking A Dynamic Approach

Overbought/Oversold Oscillators: Useless Or Just Misused?

We'll probe this question by taking a closer look at a classic oscillator—the RSI—and putting it to the test.

by Francesco P. Bufi

From time to time we encounter people who swear upon the uselessness of technical analysis and the indicators and oscillators it suggests using.

But I have to wonder: Did people like J. Welles Wilder and John Murphy (pioneers in the field of technical analysis and the authors of several notable books in the field) work with no other purpose than to cheat us? Or have their techniques perhaps stopped working? Are some of these techniques indeed useless, as some would claim?

Here's a test to find out.

THE TEST

I've taken 24 years of 60-minute data on emini S&P futures (ES) and built a very simple trading system based on the most widely known oscillator: the relative strength index (RSI).

The entry rule says "buy when $RSI < BuyLevel$."

I've used fixed-bar exits and a stop-loss to ensure I was testing just the entry setup.

I've optimized *RsiLength* and *BuyLevel*, choosing the values with the best net profit/drawdown ratio (also known as return on account).

As you can see in Figure 1, the equity line is growing, but erratically. (I'll refer to this starting system as "system1.")

I then added a trend filter in order to avoid trading during downtrends ("system2," shown in Figure 2), but the results were poor.

The problem lies in the *BuyLevel*, which should be

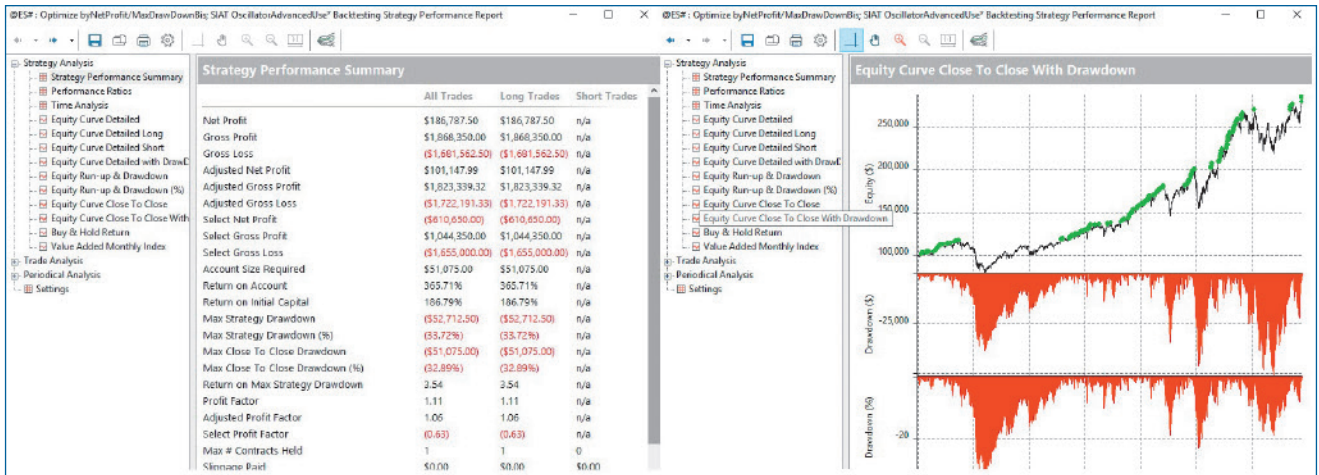


FIGURE 1: SYSTEM1. A very simple trading system based on the RSI is used to test the concept of oscillators. Here you see results from a 20-year backtest using ES data. The input parameters were optimized toward the best net profit and low drawdown. The equity line is positive but erratic.

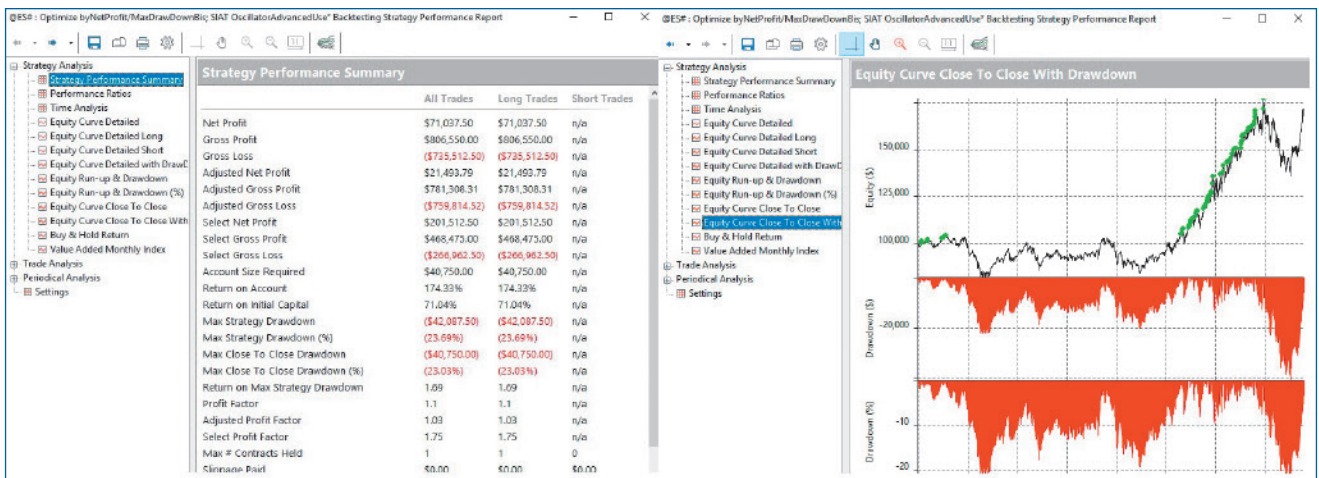


FIGURE 2: SYSTEM2. For system2, a trend filter is added in the test in order to avoid trading during downtrends, but results were poor.

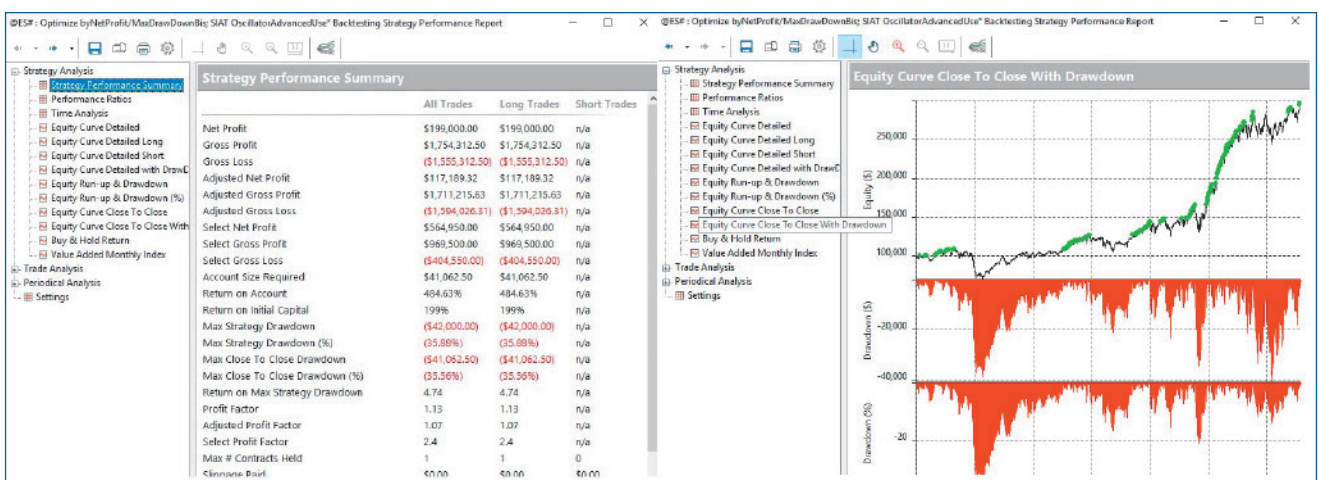


FIGURE 3: SYSTEM3. For system3, the BuyLevel is optimized separately for uptrends and downtrends. However, results are not improved.

higher when the trend is up and lower when the trend is down (see chart in sidebar, “Adaptive Thresholds”).

So, instead of avoiding trading during downtrends, let’s trade anytime but let’s optimize the *BuyLevel* separately

for uptrends and downtrends (“system3,” in Figure 3).

As you can see in Figures 2 and 3, the choices for system2 and system3 don’t solve the problem, since the net profit is halved and the drawdown is not lowered enough.

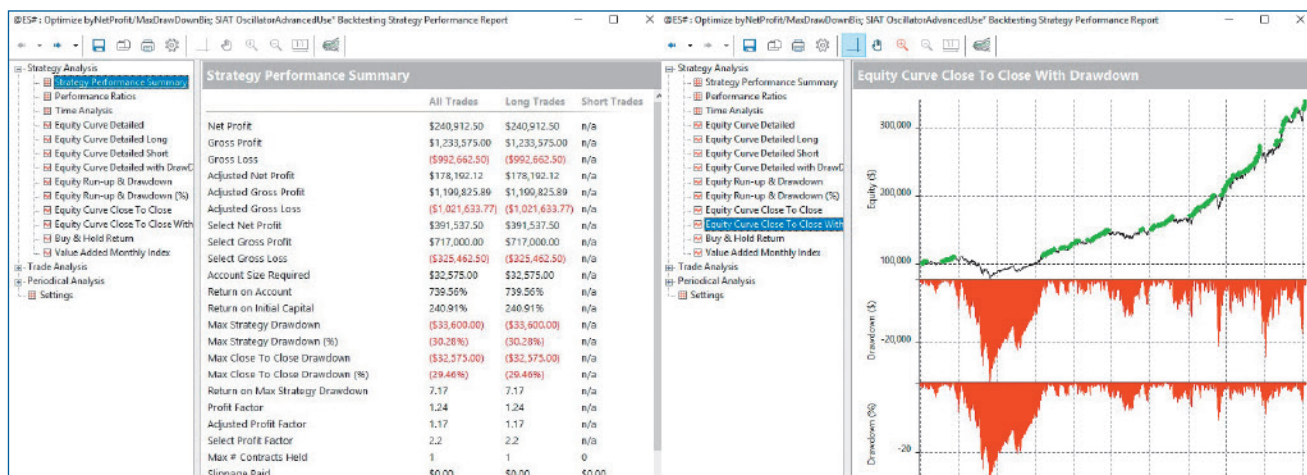


FIGURE 4: SYSTEM4. For system4, a formula continuously and dynamically measures where price is in comparison with its mean and if it is in an uptrend or downtrend. The same *RsiLength* and *BuyLevel* previously optimized in system1 continues to be used. The results of the new revised system are much improved.

Why don't we find a way to vary the *BuyLevel* continuously, instead of using fixed (albeit trend-optimized) values? There are more than two market phases, such as: uptrends, downtrends, sideways, mean-reverting, trend-following, high or low volatility, and so on.

I decided to develop a formula that could explain where the price is in comparison with its mean and if it is in an uptrend or downtrend.

THE FORMULA

Since we know that the *BuyLevel* "should be higher when the trend is up and lower when the trend is down," a measurement of the trend is directly proportional to the *BuyLevel* and should be the numerator of a hypothetical formula. On the other hand, the farther the price is from the mean (so the bigger the price-to-mean distance is), the smaller the *BuyLevel* should be, so this "distance from the mean" is inversely proportional to the *BuyLevel* and then

ADAPTIVE THRESHOLDS

By making the *BuyLevel* dynamic and letting it adjust continuously, system results are much improved in the system test. This adaptability is accomplished with a formula to measure where the price is in

comparison with its mean and if it is in an uptrend or downtrend, and then adding a multiplying factor to make it adaptive to the *BuyLevel* values.



SIDEBAR FIGURE 1: THRESHOLD LEVELS. The buy level (*BuyLevel*) in the oscillator-based system need to be higher when the trend is up and lower when the trend is down. Here, you can see a downtrend and an uptrend in an hourly chart of ES, with example buy levels.

CODE FOR ADAPTIVE THRESHOLDS, IN EASYLANGUAGE

Function:

```
// BAT: BuFi Adaptive Threshold  
// coded by Francesco P. BuFi - © 2024 - all rights reserved
```

Inputs: Price(NumericSeries),Len(NumericSimple);

```
value1=StdDev(Price,Len);  
value2=TLSlopeEasy(Price,0{1},Len);  
If value1<>0 then value3=value2/value1;  
If value3>0.5 then value3=0.5; If value3<-0.5 then value3=-0.5;  
BAT=value3;
```

Trading system for testing:

```
// TASC Oscillators:UselessOrMisused?  
// coded by Francesco P. BuFi - © 2024 - all rights reserved
```

Inputs: Sys(1),RsiLen(2),BuyLevel(14),EhlersLen(2),EhlersLevel(10),TrendLen(200), UpBuyLev(12),DnBuyLev(4),

```
AdaptLen(8),KAdaptive(6),AdaptLen2(5),KAdaptive2(7.2),  
AdaptLen3(5),KAdaptive3(7.2),AdaptLen4(5),KAdaptive4(7.2);  
Vars: osc(0),Trend(0),Ehlersosc(0);
```

```
If C>Average(C,TrendLen) then Trend=1 else Trend=-1;  
osc=Rsi(C,RsiLen);
```

```
If Sys=1 and osc<BuyLevel then Buy next bar at market; // traditional way
```

```
If Sys=2 and osc<BuyLevel and Trend=1 then Buy next bar at market; // Trend filtering
```

```
If Sys=3 then begin // Trend driven levels
```

```
    If Trend=1 and osc<UpBuyLev then Buy next bar at market;
```

```
    If Trend=-1 and osc<DnBuyLev then Buy next bar at market;  
End;
```

```
If Sys=4 and osc<BuyLevel*KAdaptive*BAT(C,AdaptLen) then Buy next bar at market; //My Way with BAT
```

```
Inputs: ExitBars(29),DollarStp(1600);  
SetStopContract; If DollarStp>0 then  
SetStopLoss(DollarStp);  
If BarsSinceEntry>ExitBars then Sell next bar at market;
```

should be put as a denominator in a possible ratio.

Coding for my formula in EasyLanguage is given in the sidebar “Coding For Adaptive Thresholds, In EasyLanguage.”

This is the explanation of my formula, which only needs a multiplying factor to be adapted to the *BuyLevel* values.

Note that in all of the tests, I’ve used the same *RsiLength* and *BuyLevel* previously optimized in system1 in order to ensure an accurate comparison of different solutions (represented in system2, 3, and 4).

As you can see in Figure 4, the results of system4 are an undeniable improvement over the others. And with this version of the system, we have also found a way to take any oscillator (not only the RSI) and make it adaptive without changing its formula—because we’ve used an adaptive technique for *reading* it. And we avoided

splitting in half the opportunities to trade as we would do using a trend filter, which allows you to trade only in uptrends or downtrends.

CONCLUSION

If we now try to answer the question posed in the title of this article, “Are overbought/oversold oscillators useless or are they just misused?” we can definitely say that

Continued on page 22



We have found a way to take any oscillator (not only the RSI) and make it adaptive without changing its formula.

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Overbought/Oversold

Can A Stochastic Indicator Be A Trading System?

Are signals from the ever-popular stochastic oscillator reliable enough to be used in a trading system? This test might help you decide.

by Perry J. Kaufman



Many of us use the stochastic indicator to time our entries and exits. It's a simple calculation that has proved valuable. It tells us where the current price is within the recent high-low range. It comes in three versions: the raw stochastic, the smoothed, and the twice-smoothed smoothed.

Raw stochastic = $100 \times (\text{Close} - \text{Lowest low}(N)) / (\text{Highest high}(N) - \text{Lowest low}(N))$

Smoothed stochastic = $\text{Average}(\text{Raw stochastic}, 3)$

Twice-smoothed stochastic = $\text{Average}(\text{Smoothed stochastic}, 3)$

By multiplying by 100, we get a value of zero to 100. It's easier than using decimals.

Analysts have called the raw stochastic *K*, the *smoothed slow-K* or *D*, and the *twice-smoothed slow-D*. I find all those names hard to remember, so I'll call them *S*, *SI*, and *S2*.

Figure 1 shows the Nasdaq ETF QQQ with the three versions of the stochastic in the lower panel based on a 10-day calculation period. Note that when the market goes sideways, the stochastic moves from high to low. During a trending period, it tends to stay above or below 50.

PICKING THE CALCULATION PERIOD

One problem with the stochastic is that it can stay at 100 or 0 if the price continues higher or lower for most of the days in the calculation period. While it doesn't happen often for a 10-day period, if you use a 5-day stochastic you will see horizontal lines at the top and bottom of the chart. That may make it difficult to decide where the overbought/oversold levels should be. When that happens, try using a longer period.

TRADITIONAL USES OF THE STOCHASTIC

The way that I've used the indicator is to enter a new upward trend when the stochastic goes below the threshold value of 20 and then turns up. If the stochastic then goes below the low of that move, I have a natural stop-loss. While anything below 50 means that prices are declining, a rising stochastic value below 50 says that it is not declining as fast. Prices are not truly rising until the value is above 50.

Depending on where the stochastic is above and below 50 and its value relative to its previous value, we can tell if the price is overbought, oversold, gaining or losing strength.

USING THE STOCHASTIC AS A TREND INDICATOR

What if we compare the performance of a 20-day moving average with a 20-day stochastic? For the moving average, we will buy and sell when the price crosses the trendline. To use the stochastic as a trend indicator, we buy and sell when the S1 stochastic crosses the value of 50. We can use the results as a benchmark. Figure 2 shows the total profits from each strategy using both long and short sales for QQQ over the past 20 years.

But both systems showed losses for short sales, which is typical for equity index markets. Figure 3 shows the same test, posting long-only trades.

Personally, I didn't expect this. Not only do they have a similar pattern, I was surprised by how well the stochastic performed. Of course, this is one case. It might do better or worse with other calculation periods and other markets. But I'll let you use the code listing in the sidebar "Code For Stochastic Trend System, In Easy-Language" to try that.

CHOICE OF RULES FOR AN OVERBOUGHT/OVERSOLD STOCHASTIC SYSTEM

We will look at other rules to see if we can make a short-term overbought/oversold strategy out of the stochastic indicator. The idea is to buy low and sell higher! We'll favor the long side for the stock index QQQ, testing the past 20 years.

One problem we face is that an indiscriminate optimization will want to make this into a trend system. That means entering on a low stochastic value and exiting when it is very high, that is, holding each trade for as long as possible and using S3, the slowest stochastic. To avoid that, we will need to force the system to exit more often

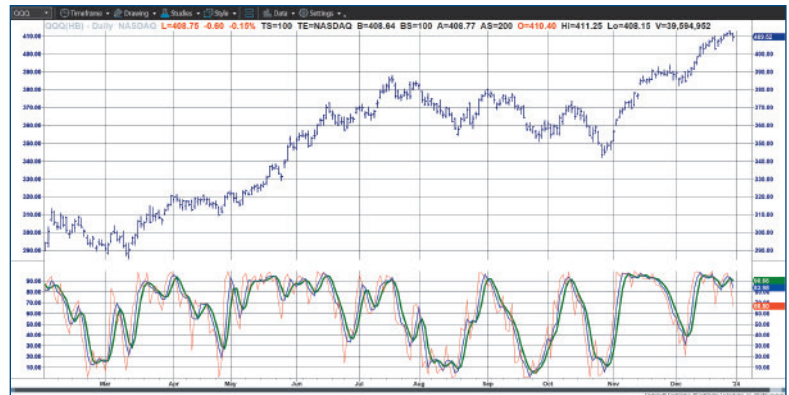


FIGURE 1: STOCHASTIC INDICATOR (THREE VERSIONS). This shows a price chart of QQQ (the ETF based on the NASDAQ index) with a 10-day stochastic below. The three versions of the stochastic plotted are the raw stochastic or S (in red), the smoothed stochastic or S1 (blue), and the twice-smoothed smoothed or S2 (green).

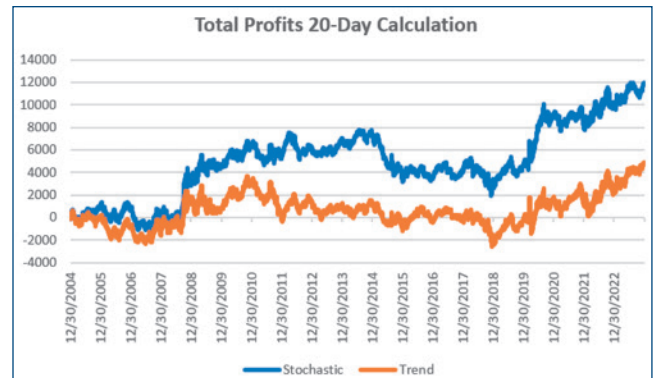


FIGURE 2: STOCHASTIC TREND SYSTEM VS. MOVING AVERAGE TREND SYSTEM (LONG & SHORT). This compares long/short profits for QQQ in a test using signals from a 20-day stochastic versus signals from a 20-day moving average.

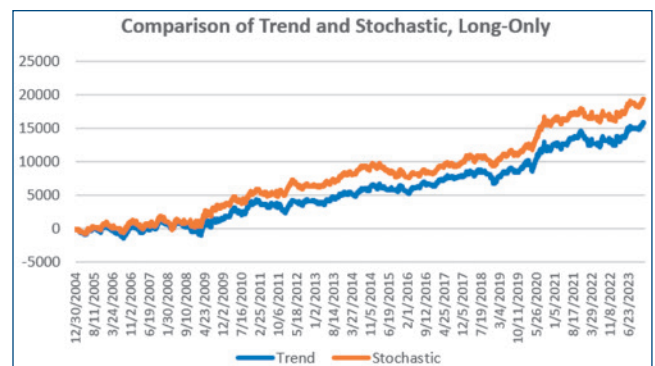
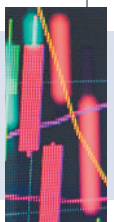


FIGURE 3: STOCHASTIC TREND SYSTEM VS. MOVING AVERAGE TREND SYSTEM (LONG ONLY). Here you see the same test as in Figure 2, only this time for long-only trading. Shown here are total profits using a 20-day period for both the MA and stochastic signals.

The stochastic indicator tells us where the current price is within the recent high-low range.



by limiting the parameters that we test.

Here are the possible rules, with the program variables on the left. Other options are in the program.

- (Period) Calculation period for the stochastic, from 4 to 30 by 2
- (Type) 1 = Use only S1, which will provide the fastest signals
- (Oversold) Threshold for oversold condition, from 5 to 45 by 5
- (Anyreversal) 1 = Buy when the stochastic turns up any time below the oversold threshold
- (Exitoption) 2 = Exit when stochastic crosses above the exit threshold then reverses
- (Exitthreshold) Used in Exitoption (above), from 40 to 70 by 5
- Always exit if a long position makes a new stochastic low
- (Longonly) “true” then only take long positions



FIGURE 4: STOCHASTIC REVERSAL SYSTEM. This shows results for a test on the optimized stochastic reversal signals using QQQ. S1 (the raw stochastic indicator) is in red.

- Period = 8
- Type = 1 (S1)
- Oversold = 45
- Anyreversal = 1
- Exitoption = 2 (allow the stochastic to cross above the exit threshold)
- Exitthreshold = 70 (exit after it reverses after 70)

INTERPRETING THE RESULTS

Given our choices, the best results for long-only trades were:

Keep in mind that there is an upwards bias in any equity index market. We used the raw stochastic, which avoids a lag, even though we enter on the next open. The calcula-

CODE FOR STOCHASTIC TREND SYSTEM, IN EASYLANGUAGE

```
// PJK Stochastic as a Trend
// Copyright 2024, P J Kaufman, All rights reserved.
// Simple system to buy/sell when stochastic crosses
// threshold

// type = 0/1, raw
//   = 2, smoothed
//   = 3, extra smoothed

inputs:    period(10), type(1), longonly(false),
printfile(true);
vars:      stoch(0), size(0), investment(10000), equity(0),
pltoday(0),
           totalPL(0), adate("");

// stochastic
stoch = 100*(close - lowest(close,period)) /
        (highest(close,period) - lowest(close,period));
if type = 2 or type = 3 then begin
    stoch = average(stoch,3);
end;
if type = 3 then begin
    stoch = average(stoch,3);
end;

// buy
if marketposition <= 0 and stoch > 50 and stoch[1] <= 50
then Begin
    buy to cover all shares next bar on open;
```

```
size = investment/close;
buy size shares next bar on open;
End
```

```
// sell
else if marketposition >= 0 and stoch < 50 and stoch[1] >=
50 then Begin
    sell all shares next bar on open;
    if longonly = false then begin
        size = investment/close;
        sell short size shares next bar on open;
    end;
end;
```

```
equity = netprofit + openpositionprofit;
PLtoday = equity - equity[1];
TotalPL = totalpl + pltoday;
```

```
if printfile then begin
    adate = ELdatestrtostring(date);
    if currentbar = 1 then
        print(file("c:\tradedstation\PJK_Stochastic_trend.
csv"), "Date,Close,Stoch,Pos,PL,Total");
        print(file("c:\tradedstation\PJK_Stochastic_trend.
csv"), adate, ",", close:8:4, ",",
            stoch:8:4, ",", currentcontracts*marketposition:8:4,
            ",", PLtoday:8:2, ",", totalpl:8:4);
    end;
```


tion period is a fairly fast 8, and the oversold condition is at 45 because it wants to be long as often as possible. For the same reason, the exit condition wants to hold a long position until a reversal after reaching 70, which

was our highest value, again reflecting the upwards bias. You can see that in the trades in Figure 4.

Were we able to get an overbought/oversold strategy? The total profits, shown in Figure 5, are somewhat

CODE FOR STOCHASTIC REVERSAL SYSTEM, IN EASYLANGUAGE

```
// PJK Stochastic Reversal
// Copyright 2024, P J Kaufman, All rights reserved.
// Simple system to buy/sell when stochastic crosses
// threshold

// "anyreversal" means buy when stochastick turns below/
// above threshold
// type = 0/1, raw
//       = 2, smoothed
//       = 3, extra smoothed
// any reversal
//       = 0, no, must pass true oversold
//       = 1, yes, any reversal below oversold
// exitoption
//       0/1, crosses exit threshold
//       2, crosses threshold then reverses
// always exits on new low or high

inputs:    period(10), overbought(80), oversold(20),
type(0), anyreversal(0), exitoption(0), exitthresh-
old(50), longonly(false), printfile(true);
vars:      stoch(0), size(0), stoploss(0), invest-
ment(10000), equity(0), pltoday(0),
totalPL(0), adate("");

// stochastic
stoch = 100*(close - lowest(close,period)) /
(highest(close,period) - lowest(close,period));
if type = 2 or type = 3 then begin
    stoch = average(stoch,3);
end;
if type = 3 then begin
    stoch = average(stoch,3);
end;

// exit on new low or high stochastic
if marketposition > 0 and close < stoploss then begin
    sell all contracts next bar on open;
end
else if marketposition < 0 and close > stoploss then
begin
    buy to cover all contracts next bar on open;
end;

// exit with profits from long
if marketposition > 0 and exitoption <= 1 and stoch > exit-
threshold then Begin
    sell all contracts next bar on Open;
end
else if marketposition > 0 and exitoption = 2 and
stoch[1] > exitthreshold And
stoch[1] > stoch then Begin
    sell all contracts next bar on Open;
end
// exit with profits from shorts
else if marketposition < 0 and exitoption <= 1 and
stoch < exitthreshold then Begin
    buy to cover all contracts next bar on open;
End
else if marketposition < 0 and exitoption = 2 and
stoch[1] < exitthreshold And
stoch[1] < stoch then Begin
    buy to cover all contracts next bar on open;
end;

// buy options
if marketposition <= 0 then Begin
    if anyreversal = 1 and stoch[1] < oversold and stoch >
stoch[1] then Begin
        size = investment/close;
        buy size shares next bar on open;
        stoploss = stoch[1];
    End
    else if anyreversal = 0 and stoch[1] <= oversold
and stoch > oversold then begin
        size = investment/close;
        buy size shares next bar on open;
        stoploss = lowest(low,period);
    end;
end;

// sell options
if longonly = false and marketposition >= 0 then Begin
    if anyreversal = 1 and stoch[1] > overbought and stoch
< stoch[1] then Begin
        size = investment/close;
        sell short size shares next bar on open;
    End
    else if anyreversal = 0 and stoch[1] >= oversold
and stoch < oversold then begin
        size = investment/close;
        sell short size shares next bar on open;
    end;
end;

equity = netprofit + openpositionprofit;
PLtoday = equity - equity[1];
TotalPL = totalpl + pltoday;

if printfile then begin
    adate = ELdate tostring(date);
    if currentbar = 1 then
        print(file("c:\tradedstation\PJK_Stochastic_Reversal.
csv"),
            "Date,Close,Stoch,Pos,PL,Total");
        print(file("c:\tradedstation\PJK_Stochastic_Reversal.
csv"), adate, ",", close:8:4, ",",
            stoch:8:4, ",", currentcontracts*marketposition
:8:4, ",", PLtoday:8:2, ",",
            totalpl:8:4);
    end;
end;
```



We can tell if the price is overbought, oversold, gaining or losing strength.

better than the trend results, however, it suffers from a drawdown in 2008. Other statistics for the stochastic reversal are better.

The stochastic reversal has 65% good trades, compared to the trend system at 31% and the stochastic as a trend at 38%. It has 365 trades compared to the trend at 270 and the stochastic trend at 248. That could make it a better timing vehicle, especially with the higher number of profitable trades.

A VIABLE SYSTEM?

My tests were not complete. I was trying to show that an overbought/oversold short-term strategy can be made into a viable system. You can use the code given in the sidebar “Code For Stochastic Reversal System, In Easy-Language” to see if you can reduce the 2008 drawdown using a faster calculation period.

Short-term trading has an advantage of being out of the market a lot of the time. In this case, the stochastic reversal system had 365 trades with an average holding period of 6.77 days. That gives the days in the market as 2,471 out of 5,040 days tested, or about 49%. That means the system has a 49% chance of avoiding future price shocks. It can be an important advantage.

Perry J. Kaufman is a trader and financial engineer. He is the author of many books on trading and market analysis, including the sixth edition (2020) of Trading

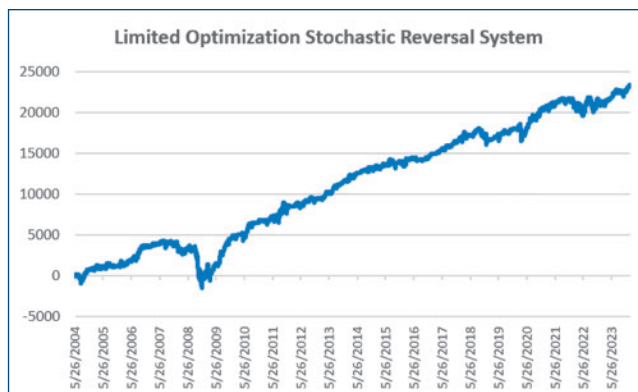


FIGURE 5: STOCHASTIC REVERSAL SYSTEM. This shows results for a limited test on the optimized stochastic reversal signals using QQQ. The total profits are somewhat better than for the moving average trend system results but there was a drawdown in 2008. Other statistics for the stochastic reversal system were better than the trend system results.

Systems and Methods (with the first edition published in 1978 as a seminal book in the field of technical analysis), as well as Kaufman Constructs Trading Systems (2020), and Learn To Trade (2022). For questions or comments, please go to www.kaufmansignals.com.

*The code given in this article is available in the **Article Code** section of our website, Traders.com.*

FURTHER READING

Kaufman, Perry J. [2022]. *Learn To Trade*, Amazon.
 — [2020]. *Trading Systems and Methods*, 6th Edition, Wiley.
 — [2020]. *Kaufman Constructs Trading Systems* (print and ebook editions), Amazon.

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OVERBOUGHT/OVERSOLD OSCILLATORS/BUFI

Continued from page 17

oscillators do actually work, but it's up to all of us as to how we use them.

Francesco P. Bufi is a professional member of SIAT.org and has been trading with technical analysis techniques for three decades. He can be reached at fjb27trade@gmail.com.

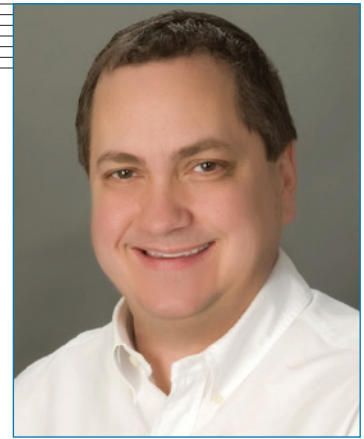
*The code given in this article is available in the **Article Code** section of our website, Traders.com.*

*See our **Traders' Tips** section of the magazine beginning on page 48 for implementation of Francesco Bufi's technique in various technical analysis and trading platforms. Code found in the Traders' Tips section of the magazine is posted to Traders.com in the Traders' Tips section of the website.*

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ALGORITHMIC TRADING

Have a question about system or algo trading? Kevin J. Davey has over 30 years of system trading experience. Davey is a full-time trader, and also teaches and consults via his Strategy Factory online workshop (<https://kjtradingsystems.com>), which was the winner of the 2024 Readers' Choice Award in this magazine for the category of "Trading Schools." Davey is also the author of five books on trading. Send your questions or topic suggestions to Kevin Davey at kdavey@kjtradingsystems.com. Selected questions will appear in a future issue of S&C.



Kevin J. Davey

ALGO TRADING EDUCATION

Algo trading seems to be all the rage these days. Can you give me some advice on purchasing algo trading education?

First, I need to disclose that I sell algo trading education. But the advice I give here is fairly general in nature and does not endorse any particular educator.

The first step is to understand what you really want. I assume you've already investigated chart (discretionary) trading and decided that algo (computerized rule-based trading) is your desired approach to the markets.

If you are unsure which type of trading you want to do, or whether trading is even appropriate for you (as opposed to investing), then you need to resolve those issues first, before going too far. It sounds pretty basic, but many people see multiple ads for algo trading and then decide they want to algo trade, without fully understanding what is involved and if it is even appropriate for them.

The second step is to research the algo trading landscape. Start by visiting trading rooms, watch YouTube videos and read trading books on algo trading. The idea here is not to fall for the first sales pitch you see, but rather to listen to multiple voices. After a short time, you'll quickly discover that most information out there is bogus—full of unrealistic assumptions and expectations.

I have two examples of bogus information: First, I am always amused by educators who claim you can trade with only 15 minutes a day. What a joke! Ask traders at any hedge fund if they work 15 minutes a day. That is your competition.

Second, beware of anyone who says algo trading is emotionless. For me, that is an obvious sign of a non-trader.

Watch out though—some educators require that you speak with a “trading consultant” to get more information, which is just a high-pressure sales call.

The concept behind the second step is to educate yourself on algo trading, get multiple points of view, and as you do that you'll become good at distinguishing algo myth from algo reality.

After you've surveyed the algo landscape, a few “tall trees” should emerge. In other words, you'll see traders or groups that resonate with your thinking, that have great reputations and who avoid the sales fluff. These are the educators you want to investigate further.

Devour all the free information you can from these educators and investigate their primary educational

product. Watch out, though—some educators require that you speak with a “trading consultant” to get more information, which is just a high-pressure sales call.

Also beware of the \$9.99 special. These are educators who offer a ridiculously cheap product, just to get you in the door. The upsell is inevitable once you do this. There is *no* comprehensive algo education that costs only \$9.99, and you can be sure you'll soon be buried in high-priced offers.

The fourth step in finding algo education, after you've done all your investigation, is to take the leap and purchase the course that fits you best. Make sure the course has a money-back guarantee, in case the course is “all sizzle, but no steak.”

A key point here is that buying the course alone is not going to make you a good trader. Your time investment is critical here; if you do not put in the time to learn and master the material, you'll never be successful. This seems fairly obvious, but many prospective algo traders likely give up shortly after purchasing a course.

As you can see, buying trading education is not a simple decision. Hopefully this short guide will get you on the road to successful algo education and trading.



LEVERAGE

Using A Double-Leveraged ETF

Trading Leveraged QQQ ETFs

Part 1: QLD

You may be able to outperform the market with favorable reward-to-risk measures by including a leveraged QQQ ETF in your portfolio allocation with a timing factor. Here is a study with trading rules and results.

by Massoud Metghalchi, PhD

The study presented in this article demonstrates that a simple trend trading system applied to a portfolio consisting of a leveraged QQQ ETF and a treasury bond index ETF provided better risk-adjusted performance than the “market” (as represented by SPY, the SPDR S&P 500 ETF Trust).

Here in part 1 of this two-article series, I’ll use the ETF QLD, a double-leveraged QQQ ETF. In part 2, to appear in a future issue, I’ll use TQQQ, a triple-leveraged ETF.

For the simple trading system used in the study, I’ll use trading signals generated by a simple moving average (SMA).

For the study, I’ll use two strategies:

1. long/money market, and
2. leverage/money market

The *long/money market* is a conservative investment strategy, whereas *leverage/money* is a riskier strategy.

Proponents of the *efficient market hypothesis* (EMH) believe technical traders cannot consistently outperform the returns of a buy & hold (B&H) strategy. I believe investors are not always rational and make mistakes, especially during bubbles and panics. Technical trading can help investors avoid mistakes based on emotion.

THE PORTFOLIO HOLDINGS: QLD AND TLT

For the test, I formed a hypothetical portfolio of two ETFs: QLD and TLT.

- **QLD** is the ProShares Ultra QQQ ETF, which seeks to correspond to two times (2x) the daily performance of the NASDAQ-100 index.

- **TLT** is an iShares ETF from Blackrock that tracks a U.S. treasury 20+ year bond index. The iShares 20+ Year Treasury Bond ETF (TLT) “seeks to track the investment results of an index composed of U.S. treasury bonds with remaining maturities greater than twenty years.”

I set up various portfolio allocations consisting of 40/50/60/70% QLD and 60/50/40/30% TLT. (For example, for the 40–60 portfolio, I used 40% QLD and 60% TLT.) I then estimated the daily returns of those portfolios.

THE TRADING MODELS

For this study, I will use a trading system to time the investments. For this, I use a simple moving average (SMA), in different lookback lengths. The lookback lengths used for the SMAs in this study are 30, 50, 100, 150, and 200 days. Price crossovers of the SMA will be the buy/sell signals.

For the test, I repeat the **trading rules** (that is, the various SMA lengths) and the **strategies** (strategies 1 and 2 described in the first section of this article) for *each* portfolio. (As already mentioned, the allocations used in the various portfolios for the test consist of 40–60, 50–50, 60–40, and 70–30 QLD and TLT.)

In different iterations of the test, the various SMAs (that is, the 30-, 50-, 100-, 150-, and 200-day SMA) are applied to the **QLD price series** to generate buy/sell signals, and then applied to the **QQQ price series** to generate buy/sell signals.

The basic idea behind the trading model is as follows: If a buy signal is emitted, then I buy a portfolio of QLD and TLT; if a sell signal is emitted, then I will go into the money market (for this, I will be using SHV, an iShares short-term treasury ETF that mimics money market funds).

The tests in this study will allow us to compare several things: the timing system versus the original portfolio; the SMA signals based on the QLD price series versus the SMA signals based on the QQQ price series; and also, we can compare the results of the signals on portfolios made up of different allocations of QLD/TLT.

The goal is to test some approaches to using a leveraged QQQ ETF in a portfolio.

Following is a more detailed explanation of the trading model, using the 40–60 QLD/TLT portfolio as the example.

QLD signals: I apply a simple moving average to QLD prices, so that buy and sell signals are generated from

QLD prices. The trading rule is that if the QLD price is above its SMA, I will be in the market, otherwise I will be out of the market, according to the two strategies outlined earlier:

Strategy 1 (40–60 QLD/TLT portfolio example)

For strategy 1, if *in* the market (that is, the QLD price is above its SMA), I buy 40% QLD and 60% TLT. If *out* of the market (that is, the QLD price is below its SMA), I invest in SHV (the short-term treasury fund/money market).

Strategy 2 (40–60 QLD/TLT portfolio example)

For strategy 2, a riskier strategy, if *in* the market, I buy QLD/TLT on margin, (meaning, the 40% of the portfolio in QLD is bought on 50% margin, and the 60% of the portfolio in TLT is also bought on 50% margin.) If *out* of the market, I invest the portfolio in SHV.

QQQ signals: In addition, I apply an SMA to the QQQ price series, so that this time, the buy and sell signals are generated from QQQ prices (instead of being generated from QLD prices), though the portfolio holding continues to use QLD. The trading rule is that if the QQQ price is above its SMA, I will be in the market, otherwise I will be out of the market, according to the same two strategies outlined earlier, as follows:

Strategy 1 (40–60 QLD/TLT portfolio example)

For strategy 1, if *in* the market (the QQQ price is above its SMA), I buy 40% QLD and 60% TLT. If *out* of the market (the QQQ price is below its SMA), I invest the portfolio in SHV (the short-term treasury fund/money market).

Strategy 2 (40–60 QLD/TLT portfolio example)

For strategy 2, a riskier strategy, if *in* the market, I use leverage to buy on margin the 40–60 portfolio of QLD and TLT. (That is, the 40% of the portfolio in QLD is bought on 50% margin, and the 60% of the portfolio that's in TLT is also bought on 50% margin.) If *out* of the market, I invest the portfolio in SHV.

QLD is the ProShares Ultra QQQ ETF, which seeks to correspond to two times (2×) the daily performance of the Nasdaq-100 index.



To see what these portfolios would look like for the trader and to illustrate the difference between strategies 1 and 2, here is an example with some hypothetical dollar numbers applied:

Say the trader follows this model with \$10,000 starting capital. For strategy 1, when the model emits a buy signal, the trader would buy \$4,000 worth of QLD ETF and \$6,000 worth of TLT ETF. For simplicity, assume the QLD price is \$50 and the TLT price is \$40; this results in 80 shares of QLD and 150 shares of TLT. For strategy 2, when the model emits a buy signal, the trader would buy 160 shares of QLD for \$8,000 and 300 shares of TLT for \$12,000, so this trader is borrowing from his broker \$4,000 to buy QLD and borrowing \$6,000 to buy TLT, resulting in 50% leverage on portfolio QLD/TLT. If out of the market, the trader invests the portfolio in SHV for both strategies 1 and 2.

DATA AND ESTIMATION

All ETF data are taken from Yahoo Finance. The QLD ETF was launched on 6/21/2006. Since we lose 200 days when estimating an SMA of 200 days, all estimations are made from 5/2/2007 to 1/24/2024.

Various statistics are estimated as follows:

$$\text{Daily return of each ETF} = \text{Log} (P_t / P_{t-1}) \quad \text{Eq. 1}$$

$$\text{Annual return} = \text{Exponential (average daily returns} \\ * 250) - 1 \quad \text{Eq. 2}$$

$$\text{Annual standard deviation} = \sigma_A = \sigma_d * \sqrt{250} \quad \text{Eq. 3}$$

$$\text{Reward-to-risk ratio (R/R)} = \text{Annual return} / \\ \text{Annual standard deviation} \quad \text{Eq. 4}$$

where P_t and P_{t-1} are the ETF's price levels on day t and $t-1$, and σ_d is the daily standard deviation (SD) of the daily returns of each ETF, assuming there are 250 trading days in a year.

The table in Figure 1 shows the risk and return metrics for each ETF and various portfolios of QLD and TLT without performing any SMA trading rules.

As can be seen from the table, SPY had an average

ETF & Portfolio	Daily Return %	Daily SD %	Annual Return %	Annual SD %	Reward to Risk
SPY	0.028	1.278	7.28	20.21	0.36
QLD	0.080	2.836	22.13	44.85	0.49
TLT	0.013	0.978	3.26	15.46	0.21
40%–60%	0.040	1.115	10.44	17.64	0.59
50%–50%	0.046	1.359	12.30	21.49	0.57
60%–40%	0.053	1.632	14.20	25.80	0.55
70%–30%	0.060	1.921	16.14	30.37	0.53

FIGURE 1: RETURN & RISK METRICS FOR SPY, TLT, & QLD, 5/2/2007–1/24/2024. Here you see the estimated returns and estimated risks for each of the three ETFs used in this study (SPY, TLT, and QLD) along with risk and return estimations for portfolios consisting of different allocations of QLD and TLT (40/50/60/70%) from 5/2/2007–1/24/2024. No market timing or investment timing system is used in this case, so this can be considered the buy & hold case.

annual return of 7.28% with an SD of 20.21% for the period under study. The reason the average annual return for the SPY here is lower than the historical average of the S&P 500 index (the historical average is about 10%) is because of the subprime crisis in 2008–2009 that resulted in a drop of almost 57% in the S&P 500 index in 2009. On 5/2/2007, the start of our estimation date, the SPY level was 149.54 and because of the bear market of 2008–2009, it took almost six years, until 1/23/2013, for the SPY to come back to the 149.54 level.

When comparing the risk–return of our ETFs and portfolios consisting of QLD and TLT, we can see that simply forming a portfolio of 40% QLD and 60% TLT beats the market (SPY). This 40/60 portfolio has a higher return than the SPY (10.44% versus 7.28%) and a lower risk than the SPY (17.64% versus 20.21%). The other combined portfolios in Figure 1 also have very good results. Their reward-to-risk ratios are much higher than the reward-to-risk ratio of SPY.

TECHNICAL TRADING RULES

I'll now consider applying the various SMA trading rules (using SMAs of different lookback lengths) to the closing price of QLD to see if we can get better results than in Figure 1 (that is, the buy & hold case and any portfolio combination of QLD and TLT). Then, I will apply the same various SMA trading rules to the closing price of QQQ to see how the results may differ.

We'll assume that a few minutes before the market closes, a trader can estimate the QLD price that will trigger a buy or sell signal, and the trader can initiate a conditional limit order to buy QLD and TLT just before the market close. (The same goes for estimating the QQQ price a few minutes before the market closes in the second case where we apply the SMA trading rules



The goal is to test some approaches to using a leveraged QQQ ETF in a portfolio.

Portfolio %	Strategy 1			Strategy 2		
	Annual Return	Annual SD	R/R	Annual Return	Annual SD	R/R
40–60	8.90 %	10.99 %	0.81	18.51 %	21.98 %	0.84
50–50	10.22 %	12.84 %	0.80	21.40 %	25.69 %	0.83
60–40	11.56 %	15.07 %	0.77	24.37 %	30.15 %	0.81
70–30	12.92 %	17.53 %	0.74	27.41 %	35.08 %	0.78

SD stands for standard deviation, R/R is the reward-to-risk ratio, and the first column shows the percentage combination of QLD and TLT.

FIGURE 2: RETURN & RISK METRICS, SMA30 SIGNALS ON QLD PRICES. Here you see the returns and risk metrics resulting from trading signals generated by the SMA30 trading rule applied to QLD prices.

to the QQQ price series.) These estimations are simple to do, but in case a trader cannot estimate the QLD or QQQ price that triggers a buy/sell signal at closing, the trader can initiate the buy/sell order the next day at the open. Placing the order the next day at the open would not change our results and would also eliminate the non-synchronicity bias.

Signal generation from SMA30 applied to QLD prices

First, I performed the 30-day SMA trading rule based on the QLD price series. When a buy signal is emitted, I buy one of the QLD/TLT portfolio combinations (40/60, 50/50, 60/40, and 70/30). For *strategy 1*, I go long the portfolio, and for *strategy 2*, I buy the portfolio on leverage as described earlier. When a sell signal is emitted, I invest the funds in SHV for both strategies 1 and 2.

Figure 2 presents the risk–return estimations.

To take a closer look, consider the row for the 40%–60% allocation in Figure 2. The SMA30 was applied to the QLD closing prices. For *strategy 1*, if the QLD closing price is above its SMA30, the next day I invest in a portfolio consisting of 40% QLD and 60% TLT. My next day's return will be a 40% return of QLD and a 60% return of TLT for that day. If QLD is below its SMA30, the next day I will be in the SHV ETF and my return will be the SHV return. For *strategy 2*, when the QLD closing price is greater than its SMA30, I double (using leverage) my investments in both 40% QLD and 60% TLT. If the QLD price is below its SMA30, the next day I will be in SHV ETF, and my return will be the SHV return.

A similar estimation is then made for the portfolios of 50/50, 60/40, and 70/30 QLD and TLT. The results are in Figure 2. You can see from these results that the trader's average annual return could range from 8.90% to 12.92% with these portfolios, much higher than the 7.28% return of the SPY, and this trader's risk could range from 10.99% to 17.53%, much lower than the SPY standard deviation

Portfolio %	Strategy 1			Strategy 2		
	Annual Return	Annual SD	R/R	Annual Return	Annual SD	R/R
40–60	8.90 %	11.25 %	0.79	18.51 %	22.50 %	0.82
50–50	10.05 %	13.16 %	0.76	21.03 %	26.33 %	0.80
60–40	11.22 %	15.45 %	0.73	23.61 %	30.91 %	0.76
70–30	12.40 %	17.98 %	0.69	26.25 %	35.97 %	0.73

SD stands for standard deviation, R/R is the reward-to-risk ratio, and the first column shows the percentage combination of QLD and TLT.

FIGURE 3: RETURN & RISK METRICS, SMA30 SIGNALS ON QQQ PRICES. Here you see the returns and risk metrics resulting from trading signals generated by the SMA30 trading rule applied to QQQ prices.

Portfolio %	Strategy 1			Strategy 2		
	Annual Return	Annual SD	R/R	Annual Return	Annual SD	R/R
40–60	10.37%	12.05%	0.86	21.72%	24.11%	0.90
50–50	12.31%	14.29%	0.86	26.05%	28.59%	0.91
60–40	14.29%	16.91%	0.85	30.53%	33.85%	0.90
70–30	16.31%	19.78%	0.82	35.17%	39.57%	0.89

SD stands for standard deviation, R/R is the reward-to-risk ratio, and the first column shows the percentage combination of QLD and TLT.

FIGURE 4: RETURN & RISK METRICS, SMA200 SIGNALS ON QLD. Here you see the returns and risk metrics resulting from trading signals generated by the SMA200 trading rule applied to QLD prices.

Portfolio %	Strategy 1			Strategy 2		
	Annual Return	Annual SD	R/R	Annual Return	Annual SD	R/R
40–60	10.26%	12.40%	0.82	21.49%	24.94%	0.86
50–50	12.02%	14.75%	0.81	25.39%	29.52%	0.86
60–40	13.80%	17.44%	0.79	29.41%	34.90%	0.84
70–30	15.61%	20.37%	0.77	33.57%	40.75%	0.82

SD stands for standard deviation, R/R is the reward-to-risk ratio, and the first column shows the percentage combination of QLD and TLT.

FIGURE 5: RETURN & RISK METRICS, SMA150 SIGNALS ON QQQ. Here you see the returns and risk metrics resulting from trading signals generated by the SMA150 trading rule applied to QQQ prices.

of 20.21%. So, applying the SMA30 trading rule to QLD to buy one of these QLD/TLT portfolios using strategy 1 can beat the market handsomely.

For strategy 2, a trader using the SMA30 trading rule applied to QLD prices will have a range of annual re-

Applying the SMA30 trading rule to QLD to buy one of these QLD/TLT portfolios using strategy 1 can beat the market handsomely.





The study demonstrates that a simple trend trading system applied to a portfolio consisting of a leveraged QQQ ETF and a treasury bond index ETF provided better risk-adjusted performance than the 'market.'

turns from 18.51% to 27.41% with a corresponding risk of 21.98% to 35.08%. This strategy would be appropriate for risk-takers.

Signal generation from SMA30 applied to QQQ prices

I then repeated the above model, but this time the buy/sell signals are generated using QQQ prices instead of QLD prices. The table in Figure 3 shows the results for applying the SMA30 rule to QQQ prices.

Figure 3 shows that even using the SMA trading rule based on QQQ prices applied to a mix of portfolios consisting of QLD and TLT with strategy 1 can beat the market, and with strategy 2, we can have much higher returns but also higher risk.

Thus, I show that the SMA30 trading rules applied to my proposed portfolios ($x\%$ QLD and $y\%$ TLT) with strategies 1 and 2 could help traders achieve better risk-adjusted performance than the market.

Signal generation from 50-, 100-, 150, and 200-day SMAs applied to both QLD and QQQ price series

Figures 2 and 3 were estimated using the 30-day SMA. Next, I perform similar estimations for SMA50, SMA100, SMA150, and SMA200; however, for the sake of space, in Figure 4, I'll only show the result of the *best* SMA trading rule for signals generated by QLD, and in Figure 5, I'll show only the result of the *best* SMA trading rule for signals generated by QQQ.

Signal generation from SMA200 applied to QLD prices

After comparing the results of SMA50, SMA100, SMA150, and SMA200, I found that the SMA200 trading rule's results were better than the other SMAs based on QLD signal generation. Thus, in Figure 4, I present the risk and return results for the SMA200 trading rule applied to QLD prices.

For the SMA200 trading rule, when a buy signal is

generated, the trader would buy any of the combinations of QLD and TLT seen in the table in Figure 4. When a sell signal is emitted, the trader invests in SHV.

These results show much higher returns and lower risks than the SPY. For *strategy 1*, the returns range from 10.37% to 16.31%, and the risk ranges from 12.05% to 19.78%, versus SPY's return of 7.28% and risk of 20.21%. For *strategy 2*, the returns are very high and the risk is also high. Returns for strategy 2 range from 21.72% to 35.17% and risk ranges from 24.11% to 39.57%. Strategy 1 would be appropriate for most traders and strategy 2 would be appropriate for risk lovers.

Signal generation based on 150-day moving average applied to QQQ prices

In the table in Figure 5, I provide only the best result after testing the SMA trading rules of 50, 100, 150, and 200 days, this time using signals generated by QQQ prices. After comparing the results of these four SMA trading rules, the 150-day SMA provided the best result. Thus, in Figure 5, I present the statistics for the 150-day SMA trading rule based on QQQ prices.

In Figure 5, for *strategy 1*: The trader applies the SMA150 trading rule to QQQ prices for signal generation. After a buy signal is generated, the trader buys one of the combinations of QLD and TLD, and when a sell signal is generated, the trader parks the funds in SHV. The average annual returns for the different portfolios range from 10.26% to 15.61% and the risk ranges from 12.40% to 20.37%, compared with the SPY's average annual return of 7.28% and risk of 20.21%.

For *strategy 2*, the range of returns is from 21.49% to 33.56%, or an average of 27.47% for the four portfolio combinations made up of QLD and TLT. The average risk of these portfolios is 32.50%. A trader following the SMA trading rule on QQQ prices with *strategy 2* could have four times the return of the market with a risk of 50% more than the market.

Finally, the number of trades generated by the SMA150 and SMA200 trading rules based on QLD and QQQ prices is between 100 to 150 over the entire period.

Since trading these ETFs does not require any explicit transaction costs, I have ignored trading commissions in these return estimations.

SUMMARY AND CONCLUSIONS

In the study presented here, I considered a portfolio consisting of QLD and TLT in various allocations; I used allocations ranging from 40% to 70% QLD and 60% to 30% TLT. I considered two strategies: *strategy 1* is a low-risk approach and *strategy 2* has a bit higher

risk than the market (SPY). I applied a well-known SMA trading rule (that is, price crossovers of the SMA) to both QQQ and QLD prices for signal generation. When the SMA rule emits a buy signal, I invest in one of the QLD/TLT portfolios for strategy 1 and for strategy 2, I buy on leverage one of the QLD/TLT portfolios. When the SMA rule emits a sell signal, I park the funds in SHV for both strategies.

Figures 4 and 5 show excellent choices for traders. If using QLD prices for signal generation, the SMA200 provided better results in the study than applying the SMA 30, 50, 100, or 150; thus, I only showed the SMA200 results here. As Figure 4 shows, based on the reward–risk ratio, applying the SMA200 to a portfolio consisting of 50% QLD and 50% TLD seems to be the best choice for both strategies 1 and 2. If using QQQ prices for signal generation, the SMA150 provided the best results in the

study, as seen in Figure 5. The best choice based on the reward–risk ratio is to apply the SMA150 to portfolios of either 40/60 or 50/50 of QLD and TLT.

Applying the SMA150 or SMA200 to my proposed portfolios of QLD and TLT using *strategy 1* could be appropriate for low-risk traders, while using *strategy 2*'s approach could be appropriate for risk lovers.

Please keep in mind that these results are based on the specific period under consideration; it is possible that future results might not be as good as the ones found in this study.

Massoud Metghalchi, PhD, is a professor of finance at the University of Houston-Victoria. He may be reached at Metghalchim@uhv.edu.

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REVISUALIZING THE ADX OSCILLATOR/HARRINGTON

Continued from page 12

Wilder's ADX and DMI concepts gives you a more intuitive view of the information. Good luck and good trading!

Neil Jon Harrington, owner of NJH Group, provides consulting, training, and system development services. He has a bachelor's degree with high honors in computer science. You can contact the author at njharrington@gmail.com.

*The code given in this article is available in the **Article Code** section of our website, [Traders.com](https://www.Traders.com).*

FURTHER READING

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The histogram coloring allows you to easily see when the trend is up or down, when it is increasing or decreasing, and what threshold level it is in.



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CHARTING THE MARKETS

Stella Osoba, CMT, Esq., is an attorney, trader, and financial writer in New York, NY, and is also the Senior Editor, Trading and Investing, for Investopedia.com. Her work in financial litigation involving regulatory bodies and large multinational corporations led to an interest in the financial markets, then technical analysis and the psychological aspects of market behavior. She earned a CMT charter in 2013 and was a director-at-large on the board of the CMT Association for four years. This column will focus on recognizing and applying technical chart patterns to trading with flexibility and astuteness for better decision-making in trading. She can be reached at stellaosoba@gmail.com.



Stella Osoba

REVIEWING MARKET VOLATILITY

The volatility that gripped the stock market in early August 2024, intensifying in the week of August 12, 2024 left many market participants shaken. Here, I'll take a look at what I believe are some of the most useful technical indicators to help us see if they offer any insights into the market's recent behavior.

Volatility index

The first chart, Figure 1, shows the CBOE Volatility Index (VIX), commonly referred to as the “fear index.” The VIX is a measure of implied volatility using a basket of S&P 500 puts and calls. It measures the expected implied volatility for the next 30 days. We can see that the VIX was at the lower end of its range for the months depicted on the chart until the latter part of July 2024. As market volatility increased, the VIX rose from lows below 12 to high extremes of above 38.57. The week of August 5 was especially volatile—the VIX jumped to a high of 65.73 and fell to a low of 23.39 that week. It finally closed at 38.57 at the end of the week.

The VIX is a measure of implied volatility using a basket of S&P 500 puts and calls.

New York Composite Index

The New York Composite Index (Figure 2) covers all common stocks listed on the New York Stock Exchange. On the chart in Figure 2, after the October 2023 lows we can see a steady uptrend as stocks marched higher until March 2024, when cumulative prices began to trade sideways. But the market remained orderly with the VIX still trading around 12 to just above 13, but never breaking 14. All this changed in July 2024 when the VIX began to spike upwards as price continued to trade sideways but slightly higher. In the weeks of July 15 and July 29, price formed long upper tails, indicating increased selling. It wasn't until the week of August 5 that volatility saw a significant spike, with the long tail

of the candlestick showing increasing bearishness.

Advance-decline line

The advance-decline line (A-D line) is another technical indicator that is useful to look at during times of market uncertainty. This indicator does not measure volatility; rather, it measures the underlying health of the market. Volatility in the markets can be indicative of a coming trend change, but it's not always the case. For further market analysis, it is wise to look into the health of the *components* of the market. The advance-decline line measures the number of stocks that are advancing minus those that are declining. When the line is rising, it means more stocks are rising



FIGURE 1: VOLATILITY INDEX. The CBOE Volatility Index (VIX), commonly referred to as the “fear index,” was below 12 in late July 2024, then rose to above 38.57 as market volatility increased. During the volatile week of August 5, the VIX jumped to 65.73 and fell to 23.39, closing at 38.57 for the week.

The advance-decline line is another technical indicator that is useful to look at during times of market uncertainty.

than declining, and vice versa if the line is descending. This is a general indicator of market health.

In the chart in Figure 3, we can see that the A-D line had been declining but at the right side of the chart it is moving upwards to the zero line. This indicates that the market is weak but is heading towards positive territory. The histogram in the lower panel also confirms the direction as of August 9, 2024.

If the A-D line were to make higher highs like it did in mid-July 2024, this would show market strength and confirm that more stocks are advancing than declining.

McClellan oscillator

Like the A-D line, the NYSE McClellan oscillator is another useful breadth indicator. This breadth indicator is created by using a formula to deduct advancing stocks from declining ones, and using the results to plot an oscillator. Figure 4 shows the McClellan oscillator as a histogram. The green oval drawn on the chart points out how choppy markets were in July–August 2024 as the oscillator swings above and below the zero line.

A FINAL WORD

The technical indicators shown in these charts can help us gain insights into the health of the market, and from here, we can deduce possibilities about what is likely to happen. The VIX closing at 20.37 tells us that though still elevated, fear in the market has somewhat subsided. The



FIGURE 2: NEWYORK COMPOSITE INDEX. After the October 2023 lows, we can see a steady uptrend as stocks marched higher until March 2024, when cumulative prices began to trade sideways. In the second half of July 2024, price formed long upper tails, indicating increased selling. In the week of August 5 volatility saw a significant spike, with the long tail of the candlestick showing increasing bearishness.

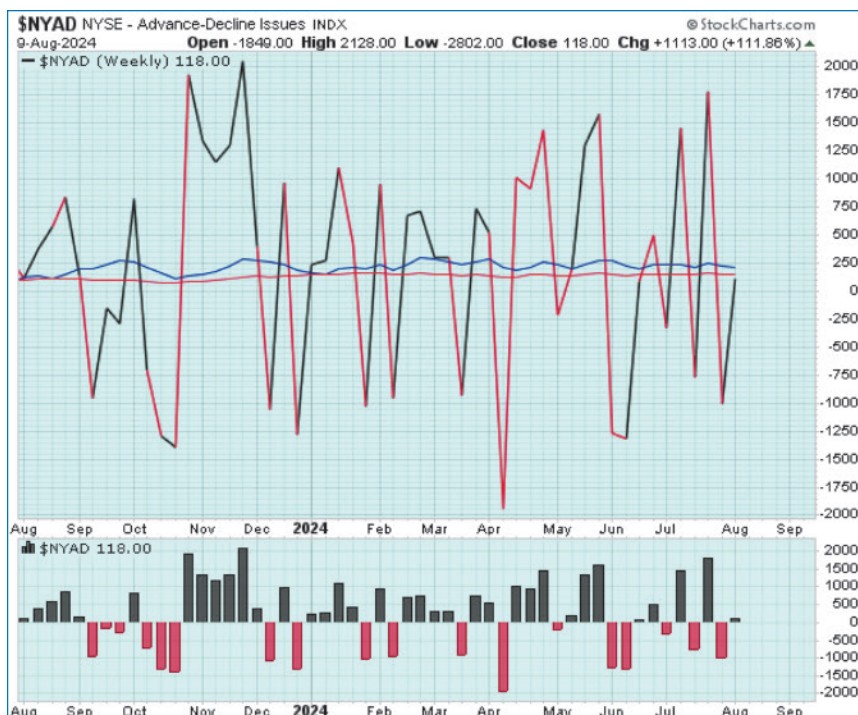


FIGURE 3: ADVANCE-DECLINE LINE. The A-D line, an indicator of overall market health, was declining but then moves upwards to the zero line, showing that the market was weak but is heading towards positive territory here. The histogram in the lower panel confirms the direction as of August 9, 2024.

spinning top that formed in the last week of trading on the chart in Figure

Continued on page 38



An Algorithmic Approach

Tesla Stock: Comparing Traditional Investment Strategies With Systematic Trading

Here's a demonstration of a simple algorithmic strategy, made up of just a few lines of code, that you can use to potentially capture profit from a rising stock while protecting against sharp retracements.

by Andrea Unger



Tesla made its debut on the New York Stock Exchange on June 29, 2010. In just a few years, it has become a symbol of the tech stock boom in the U.S. market. Since its IPO, Tesla's stock has surged more than 100-fold over the years.

Stocks are a familiar financial product, even to novice investors, and they form the cornerstone of tradi-

tional portfolios alongside bonds. Whether included in exchange-traded funds (ETFs), mutual funds, or bought individually, stocks are the go-to option for those who prefer not to engage with more complex but efficient financial instruments like futures.

This article aims to explore the potential of Tesla (TSLA) stock by comparing traditional investment approaches with a rules-based trading system that we'll develop here.

COMPARING BUY & HOLD WITH TWO RULES-BASED TRADING SYSTEMS

First, we need to define our time horizon and the timeframe for our tests. Given Tesla's relatively recent history, we might consider using all available data. We could

opt for the “classic” 15-minute timeframe to provide sufficient detail in our entries, regardless of the system developed.

Next, let’s clarify our goal. Given the familiarity of investors with stocks, it would be interesting to compare the simple buy & hold strategy with systematic trading strategies. For instance, we might consider a strategy based on a very popular indicator, the 200-period moving average, or a trading system that buys Tesla shares when the price breaks above the session highs.

Here’s how we can implement these three approaches:

- **Buy & hold strategy:** Purchase Tesla shares worth \$10,000 on the listing day (June 29, 2010) and hold until April 30, 2024.
- **Moving average strategy:** Purchase Tesla shares worth \$10,000 when prices are above the 200-period simple moving average and sell when prices fall below this average.
- **Algorithmic trading system:** Buy Tesla shares when the price breaks above the session highs and close the long position after five trading days or upon reaching a stop-loss, which is set at 5% of the transaction value (\$10,000 per trade). No short selling will be performed.

We can translate these ideas into PowerLanguage code—see Figure 1. The coding will allow you to test

Buy & Hold Strategy (15-min TF)

```
If date=1100629 then buy next bar at market;
if date=1240430 and time=1530 then sell next bar at market;
```

Moving Average Strategy (data1, 15-min TF --- data2, Daily TF)

```
if c data2>average(c data2,200) then buy next bar at market;
if c data2<average(c data2,200) then sell next bar at market;
```

Advanced Trading System (15-min TF)

```
input:startTrade(930),endTrade(1600);
input:maxdays(5);
input:mystop(500);

//entries
if t>startTrade and t<=endTrade and entriestoday(d)=0
then begin
    buy next bar at highs(0)stop;
end;

//exit after n days
if (date-entrydate)>=maxdays then sell next bar at market;

//stop loss
if mystop>0 then setstoploss(mystop);
setstopposition;
```

FIGURE 1: CODE FOR THREE APPROACHES, IN POWERLANGUAGE. Here is some PowerLanguage coding for testing the three approaches—buy & hold, a 200-period moving average, and a simple algorithmic trading system. This code is provided to allow the comparison of buy & hold against the two systematic trading approaches.

Tesla (TSLA), thanks to its volatility, is undoubtedly an interesting stock for systematic traders.



FIGURE 2: BUY & HOLD. Here, you see hypothetical results from buying and holding TSLA stock over its entire price history. While this approach would yield a good result in a stock with strong growth such as this, it is unrealistic.

these three approaches, using TSLA, to compare the results.

RESULTS OF THE THREE STRATEGIES APPLIED TO TESLA STOCKS

In Figures 2, 3, and 4, we can see the results from applying the three strategies. Figure 5 summarizes the metrics from each strategy.

The results clearly show that the buy & hold approach would have yielded the highest net profit, largely due to

Tesla's exponential price growth over the years. However, it's unrealistic to assume an investor would hold such a position for that long, watching profits grow without selling, especially in the face of significant drawdowns. Investors would have bought the stock at different times, and the large gain seen in this extreme case could have turned into a loss if the stock was bought at its historical highs in 2021 or more recently.

The second case, based on the 200-period moving average strategy, is more sustainable, though it still involves

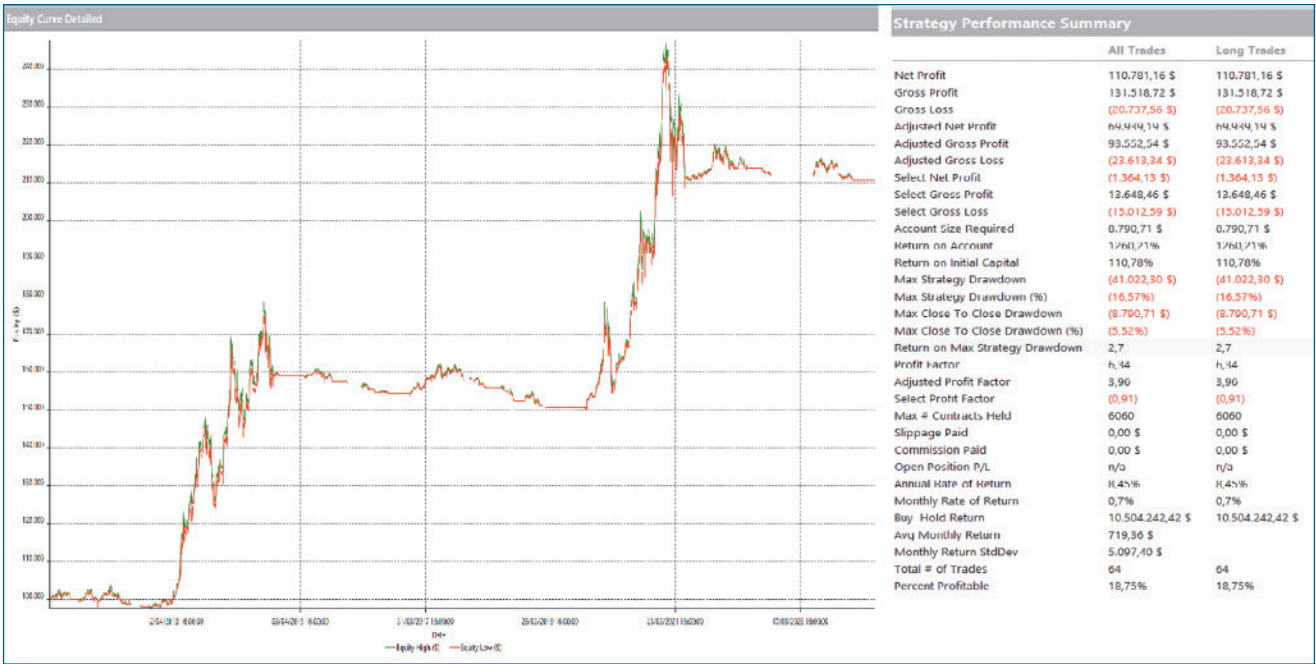


FIGURE 3: MOVING AVERAGE SYSTEM. Here, you see hypothetical results from buying and selling TSLA based on signals from a 200-period moving average. These results are more realistic than the buy & hold case in Figure 2, but this approach involves large drawdowns.

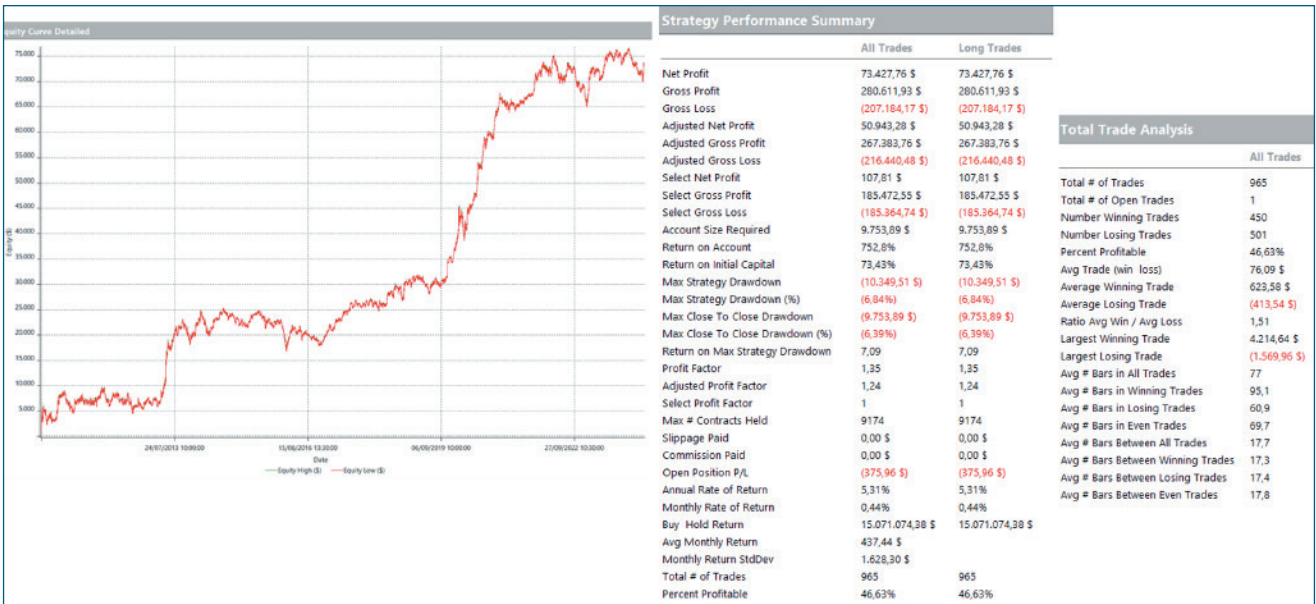


FIGURE 4: ALGORITHMIC TRADING SYSTEM. Here, you see hypothetical results from buying and selling TSLA based on signals from a simple rules-based algorithmic trading system. Compared with the cases in Figures 2 and 3, this represents a better overall solution.

high drawdowns.

The third solution employs a simple algorithmic strategy made up of just a few lines of code. This solution helps in producing regular profits while protecting against catastrophic drawdowns caused by sharp retracements.

IMPROVING THE TRADING SYSTEM: BEST TIMES TO OPEN POSITIONS

Now, let’s consider improving the strategy. Reflecting on our entry setup, the trading system buys at the breakout of the session’s highs and can open positions at any time during the day (session 9:30 a.m.–4:00 p.m.) without any time restrictions. Clearly, buying shortly after the start of the session (for example, at 10 a.m.) is not comparable to an entry made a few hours later, as the high formed in the early session is relatively insignificant compared to a midday high (for example, 12 noon).

This is because the session start, as generally seen in all quoted financial instruments, is the phase where prices are most volatile and erratic, without a clear trend for the day. Thus, letting our system operate all the time is probably not the optimal or the most logical choice. Let’s verify our hypotheses and optimize the “startTrade” and “endTrade” inputs, which define the time window in which our trading system can operate. (See Figure 6.)

From the optimization, we see that delaying the start of our time window by a few hours (such as 11:30 a.m.) and ending it 30 minutes before the session’s end (3:30 p.m.) maintains nearly the same net profit (\$73,503.41), but

Strategy Type	Net Profit	Average Trade	Number of Trades	Max Drawdown
Buy & Hold	\$1,509,915.44		1	–\$2,584,070.16
200-period Moving Average	\$110,781.16	\$1,730.96	64	–\$41,022.30
Advanced Trading System	\$73,427.76	\$76.09	965	–\$10,349.51

FIGURE 5: SUMMARY OF RESULTS. This summarizes the results from the three approaches implemented in Figures 2, 3, and 4, after applying the three strategies to TSLA.

the number of false signals drops significantly, reducing the number of trades from 965 to 701, with a substantial increase in average trade from \$76 to about \$105. The maximum drawdown also decreases from \$10,349.51 to \$6,950.01.

Our hypothesis is confirmed by the numbers. (See Figure 7.)

ENHANCING THE TRADING SYSTEM: POSITION SIZING AND EXITS

At this point, what other possibilities do we have to improve our strategy while keeping the rules simple? An important aspect we haven’t considered is more advanced position sizing management, which can make a difference, especially with highly volatile assets. In our trading system, we always buy and sell with the same monetary size (\$10,000) without considering the cumulative gains of our equity, which we could reinvest to increase our profits.

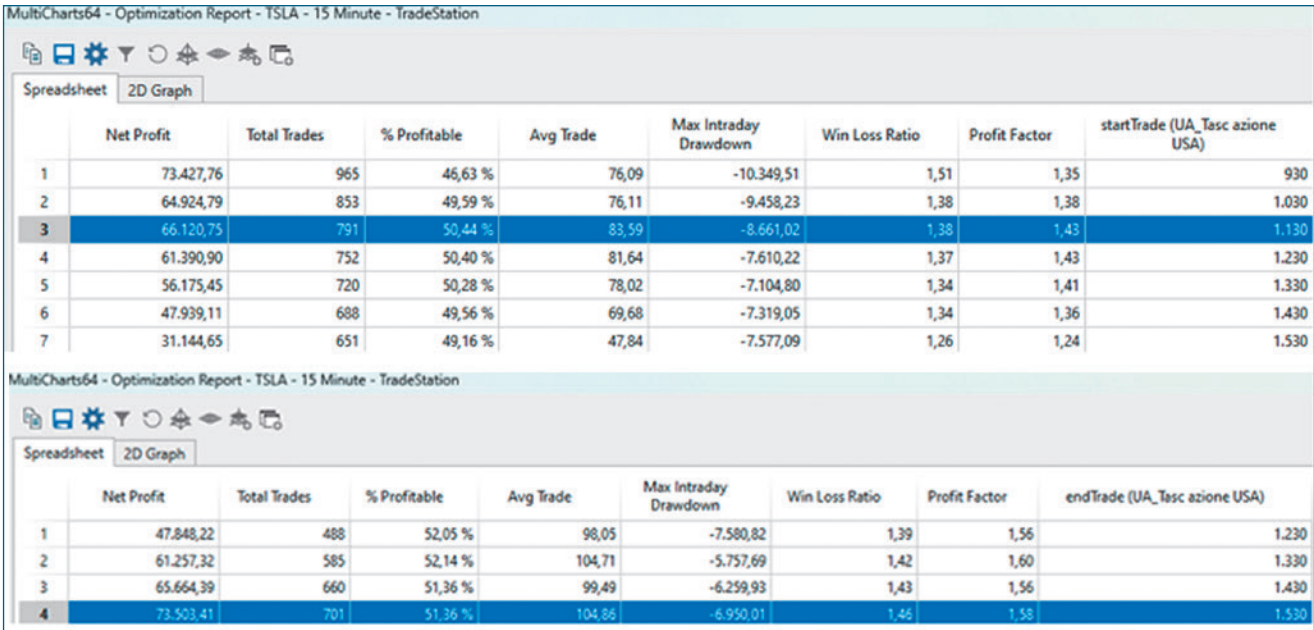


FIGURE 6: OPTIMIZING THE TRADING WINDOW. The “startTrade” and “endTrade” inputs can be optimized to find the best time window for trading the vehicle.



FIGURE 7: RESULTS AFTER OPTIMIZATION OF TRADING WINDOW. After the trading hours are optimized in Figure 6, we get these revised results from the trading system. Compare with Figure 4, which was before optimization of the trading window and didn't restrict the trading hours for the system. Net profit stays about the same as in the original system but the number of false signals drops significantly.

```

input: startTrade (930), endTrade (1600);
input: maxdays (5);
input: mystart_capital (10000);

var: mysize (0);
var: mycapital (0);

mycapital = mystart_capital + (netprofit + openpositionprofit);

mysize = (mycapital / close * bigpointvalue);

//entries
if t > startTrade and t <= endTrade and entriestoday(d) = 0
then begin
    buy mysize shares next bar at highs (0) stop;
end;

//exit after n days
if (date - entrydate) >= maxdays then sell next bar at market;

//stoploss - profit target
input: stop_loss (2), profit_target (2), per (5);
value1 = AvgTrueRange (per);

if stop_loss > 0 then setstoploss (mysize * value1 * stop_loss * bigpointvalue);
if profit_target > 0 then setproftarget (mysize * value1 * profit_target * bigpointvalue);

setstopposition;

```

FIGURE 8: CODE FOR ALGORITHMIC TRADING SYSTEM USING OPTIMIZED INPUTS, IN POWERLANGUAGE. Here, the coding for the algorithmic trading system is revised to allow the inputs to vary for the stop-loss, profit target, and starting capital. This way, optimized values for these three inputs could be used.

Thus, we might start with the same fixed monetary size (\$10,000) as the other two strategies, then adjust it for each new trade based on gains and losses; we'll refer to the net profit of our equity curve to calculate the number of shares to buy at each entry.

This way, we must also modify the stop-loss calculation to adjust it based on the number of shares bought and possibly also based on the underlying asset's volatility (for example, by using the average true range indicator). We might also introduce a profit target to test its benefits.

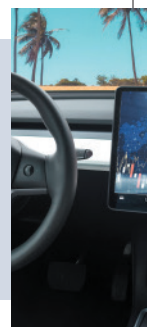
Let's translate these concepts into PowerLanguage code with optimized inputs for "stop_loss," "profit_target," and

"period," where *period* is the number of bars on which the ATR is calculated. (See Figure 8.)

Figures 9a and b show the new results after optimizing the inputs for the stop-loss, profit target, and the ATR period. As we can see from the results, sorted by descending net profit in Figure 9a and by increasing drawdown in Figure 9b, using a variable size that reinvests earned profits, proves to be successful. The values obtained can vary significantly based on the stop-loss and profit target, but it's interesting to note that selecting either the highest net profit (\$2,646,556.78) or a lower value (\$1,070,160.16) from those results obtained in a strategy (we'll refer to the choice of either of these two as "hypotheses 1 and 2") is comparable to or is much better than the buy & hold results, only with a significantly lower drawdown, and with precise, codified rules and risk management that protect against "wild" position fluctuations. The initial size, assumed to be \$10,000 in this test, can be adjusted according to the traders' preferences based on their available resources.

In Figures 10a and 10b, equity curves are shown for the system using position sizing, with hypothesis 1 (that

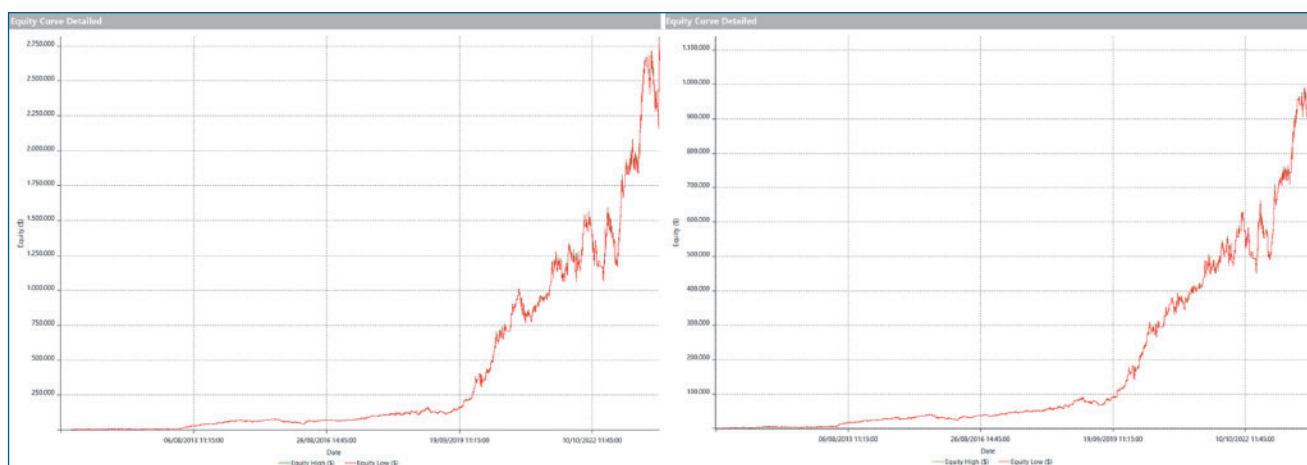
This article aims to explore the potential of Tesla (TSLA) stock by comparing traditional investment approaches with a rules-based trading system.



Net Profit	Total Trades	% Profitable	Avg Trade	Max Intraday Drawdown	Win Loss Ratio	Profit Factor	stop_loss (UA_Tasc azione USA_v2)	profit_target (UA_Tasc azione USA_v2)	per (UA_Tasc azione USA_v2)
2.646.556,78	1.074	49,16 %	2.464,21	-556.336,19	1,46	1,43	3	5	100
2.493.975,89	1.014	46,45 %	2.459,54	-498.928,58	1,64	1,44	3	6	160
2.412.931,70	970	42,78 %	2.487,56	-662.190,34	1,82	1,38	3	8	30
2.367.817,91	1.018	46,27 %	2.325,95	-551.704,96	1,60	1,39	3	6	200
2.357.410,92	1.016	46,46 %	2.320,29	-517.671,36	1,62	1,42	3	6	180
2.315.178,74	1.076	48,88 %	2.151,65	-490.819,60	1,44	1,39	3	5	85
2.239.525,36	1.133	43,60 %	1.976,63	-468.723,92	1,89	1,48	3	6	10
2.190.053,68	920	41,96 %	2.380,49	-595.581,33	1,87	1,37	3	9	55
2.188.303,46	918	40,09 %	2.383,77	-704.044,38	1,98	1,34	3	10	35
2.131.417,50	1.017	46,02 %	2.095,79	-493.471,50	1,63	1,41	3	6	130

Net Profit	Total Trades	% Profitable	Avg Trade	Max Intraday Drawdown	Win Loss Ratio	Profit Factor	stop_loss (UA_Tasc azione USA_v2)	profit_target (UA_Tasc azione USA_v2)	per (UA_Tasc azione USA_v2)
538.277,11	1.018	31,24 %	528,76	-177.070,23	3,09	1,41	2	9	50
486.249,85	1.024	29,30 %	474,85	-177.915,66	3,22	1,34	2	10	20
1.070.160,16	1.193	58,84 %	897,03	-177.947,97	1,02	1,46	3	3	75
662.792,30	998	32,67 %	664,12	-180.679,87	2,93	1,43	2	9	170
599.566,63	949	42,04 %	631,79	-182.652,51	1,83	1,34	3	8	170
677.401,49	995	32,96 %	680,81	-183.387,56	2,86	1,42	2	9	200
646.569,31	1.067	34,68 %	605,97	-183.421,10	2,63	1,40	2	7	95
641.000,44	1.016	42,42 %	630,91	-183.646,59	1,74	1,29	3	7	45
631.073,10	1.032	30,81 %	611,50	-184.559,95	3,10	1,39	2	9	35
602.751,68	1.069	36,58 %	563,85	-184.642,64	2,24	1,34	3	9	5
637.428,30	951	42,17 %	670,27	-185.167,25	1,84	1,35	3	8	165
736.954,61	981	43,43 %	751,23	-185.328,38	1,73	1,34	3	7	160
702.025,05	1.063	31,89 %	660,42	-185.367,13	2,96	1,39	2	8	35
866.996,57	1.107	47,61 %	783,19	-186.149,07	1,48	1,36	3	5	50

FIGURES 9A & B: OPTIMIZING THE POSITION SIZE, STOP-LOSS, AND PROFIT TARGET. This shows results and system metrics after optimizing inputs related to starting capital and exits. In the top table, results are sorted by descending net profit and in the second table, by increasing drawdown.



FIGURES 10A & B: EQUITY CURVES. Equity curves are shown for the system, with hypothesis 1 in Figure 10a and hypothesis 2 in Figure 10b. Hypothesis 1 relates to choosing the highest net profit from the results in Figure 9A and testing that option, while hypothesis 2 relates to choosing the result highlighted in Figure 9B to test.

is, choosing the highest net profit) shown in Figure 10a and hypothesis 2 (that is, choosing a lower net profit value) shown in Figure 10b.

In Figure 11, you see the results summary for the algorithmic system using hypothesis 1 for position sizing, compared to results from buy & hold and the 200-period MA system.

This solution helps in producing regular profits while protecting against catastrophic drawdowns caused by sharp retracements.



Strategy Type	Net Profit	Average Trade	Number of Trades	Max Drawdown
Buy & Hold	\$1,509,915.44		1	−\$2,584,070.16
200-Period Moving Average	\$110,781.16	\$1,730.96	64	−\$41,022.30
Trading System with Position Sizing (Hypothesis 1)	\$2,646,556.78	\$2,464.21	1074	−\$556,336.19

FIGURE 11: HYPOTHETICAL RESULTS COMPARISON, TRADITIONAL INVESTMENT STRATEGIES VS. SYSTEMATIC TRADING. The results summary allows you to compare metrics for the buy & hold approach, the 200-period moving average system, and the algorithmic trading system using hypothesis 1.

CONCLUSIONS: COMPARING TRADITIONAL STRATEGIES AND SYSTEMATIC TRADING

We've reached the end of our tests and can draw some conclusions. Tesla (TSLA), thanks to its volatility, is undoubtedly an interesting stock for systematic traders, and as our studies have shown, a more dynamic approach to the stock, as opposed to simply holding it, would have spared many headaches during the tough years, with excellent profits. At this point, we leave it to the reader to further improve this system and adapt it to their needs.

Happy trading and see you next time!

Andrea Unger is a full-time professional trader, president of The Unger Academy, and author of The Unger Method. He is a four-time World Trading Champion (2008, 2009, 2010, and 2012), an honorary member of SIAT (Italian Society of Technical Analysis, a branch of IFTA), and speaks throughout Europe, America, Australia, and Asia. He may be reached at Andrea@UngerAcademy.com. The Unger Academy provides services to traders, including individuals, to help them improve their approach to trading (more information can be found at <https://autc.pro/tasc>).

FURTHER READING

Unger, Andrea [2021]. *The Successful Trader's Guide To Money Management: Proven Strategies, Applications, And Management Techniques*, Wiley Trading.

— [2021]. *The Unger Method: The Winning Strategy Of The 4-Time World Trading Champion*, The Boss Books.

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OSOBA

Continued from page 31

2 depicting the NYSE Composite Index tells us that sentiment was still bearish. The A-D line is moving up in Figure 3 but is still below zero. That shows that net declines in stocks were greater than net advances, though not by much. By this measure, market could be approaching equilibrium. The McClellan oscillator confirms the reading from the A-D line and also confirms the market volatility. As to market direction, we would need to see clearer signals.

Both of the market breadth indicators reviewed here work best at extremes to confirm bearish or bullish conditions. That was not the case seen here.

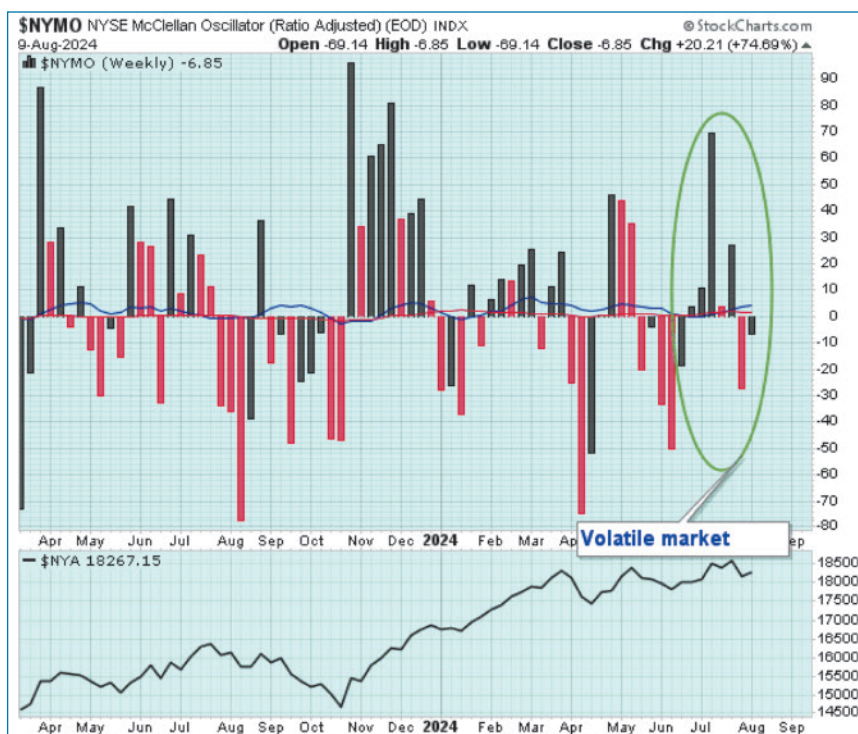


FIGURE 4: MCCLELLAN OSCILLATOR. The McClellan oscillator, a breadth indicator, is plotted here as a histogram. The green oval points out market choppiness that occurred over several weeks as the McClellan oscillator swings above and below the zero line.

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THE WORLD OF RETAIL TRADING

Emilio Tomasini has been an adjunct professor of corporate finance at the University of Bologna in Italy for almost 20 years and is also a professional trader. In this column, he shares his sometimes “unserious” thoughts on serious topics in finance. Through his writings, he aims to help retail traders better understand the leap from unprofitable to profitable trading, firmly believing that the right answers can only come if the right questions are asked. Since 1996, he has published a weekly newsletter on Nasdaq stocks on his website, www.emiliotomasini.com, using a trend-following strategy based on the principles he has learned during his 30-year career in the financial markets.



Emilio Tomasini

THE MOST INFLUENTIAL TRADER IN MY TRADING

If there is an obligation of collegiality among some categories of professionals—a legacy of medieval corporatism but a fact in every country—the relationship between traders is nearly nonexistent. A grandfather stands outside the school where all the other grandparents are waiting for their grandchildren to be released: “The environment is unbearable,” this grandfather recounts, “because every grandparent tells the others how intelligent, well-behaved, and brilliant their own grandchild is, even claiming theirs is the best of all.” But reality, our grandfather explains, is different because *his* grandchild is the most intelligent of all!

The same scenario occurs among traders: If you ask a trader who the best trader is, they may very well respond that they themselves are the best. Here, I want to break this taboo: If you ask *me* who is the trader that, even without knowing them personally, has given me the most in my professional life, I will answer without hesitation: It’s Laurence A. Connors, nicknamed Larry. If you go to Amazon.com, you will find just some of his encyclopedic production. And for me, I will say that there is not a single trading system of mine that doesn’t incorporate some of his rules.

Whatever my own trading abilities may or may not be, those who know me well are aware that one of my true

talents is accumulating, storing, and preserving any document, interview, software, code, book, or article related to trading systems. I’m a bit like the Gestapo or the KGB: I have a finance archive that is fearsome. You might say I am a serial hoarder. That is why over the years, I have obsessively accumulated all the material produced by Connors to the extent that if he has lost something, he might ask me directly for it.

I must say that generally, I have always detested the habit of the publishing industry of obsessively proposing content with a similar base but different declinations to the

There is not a single trading system of mine that doesn’t incorporate some of his rules.

public. In Connors’ case, however, even the most trivial variations were always pure gold: even if the trading system in one book was similar to that of the previous book, there was always something that made it different and unique, something that pushed you forward. And what a leap forward it could be!

I think the three trading techniques of Connors that I have appreciated the most are the following:

- Buy when a stock drops by 5%

and close the long at the end of the day

- A breakout is valid when it occurs within a maximum number of days from various other conditions
- If you buy when the RSI is over-sold, this is always and without exception better.

These are typically mean-reverting concepts, but many can also be applied to directional trading systems without any issue. And the performance increases significantly.

Now, you may wonder why I am giving such a blatant assist to this gentleman whom I have frankly never shaken hands with and from whom I have no personal gain. I do it because I am convinced that in life, when you have taken something from someone, you also have a moral obligation to give back. And Larry Connors has given me a lot. If today I render him the honor of arms, it is because he deserves it, and among us older traders, the infantry saying applies: you salute the rank, not the man. And Connors holds a higher rank than I do.

FURTHER READING

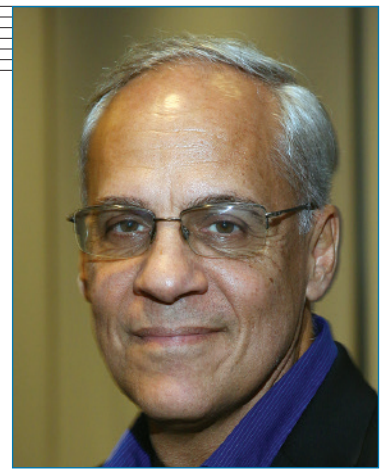
Gopalakrishnan, Jayanthi [2004]. “Larry Connors On How Markets Really Work,” interview, *STOCKS & COMMODITIES*, Volume 22: December.

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Explore Your Options

GOT A QUESTION ABOUT OPTIONS?

Jay Kaeppel has over three decades of experience in the options markets. He was a head trader for a CTA firm, an options trading software developer, and was a portfolio manager for an investment management firm. He is presently Senior Research Analyst for Sentimentrader.com. He is the author of several books, including *The Four Biggest Mistakes In Option Trading*; *The Option Trader's Guide To Probability, Volatility, And Timing*; and *Seasonal Stock Market Trends*. Send your questions or topic suggestions to Jay Kaeppel at jay@sentimentrader.com. Selected questions will appear in a future issue of S&C.



Jay Kaeppel

LONG-DATED FAR-OUT-OF-THE-MONEY CALENDAR SPREADS

I am looking for a way to speculate on potential big moves in stocks. I hope to limit my dollar risk and minimize the negative effect of time decay. Do you have any suggestions?

A long-dated, far-out-of-the-money calendar spread is an inexpensive way to speculate on a significant move in price. In many cases, the mathematical probability of success in a given trade is initially low. However, the trade-off is that the initial dollar risk can be very low (and the maximum risk is limited at the time of trade entry), and the upside potential can be substantial. The key is finding good opportunities. The steps detailed below are not intended as a “magic formula” but as an example of a process that may uncover opportunities with the most beneficial trade-off between reward and risk.

SCREENING FOR STOCKS TO CONSIDER

We start by looking for a time when it makes sense to look for bullish trades. In Figure 1 (courtesy of AIQ TradingExpert), we look for times when the S&P 500's MACD indicator drops below zero, and then the MACD histogram moves back above zero while the index is above its 200-day moving average. This happened on May 23, 2024.

This setup does not guarantee a bullish move in the broader market.

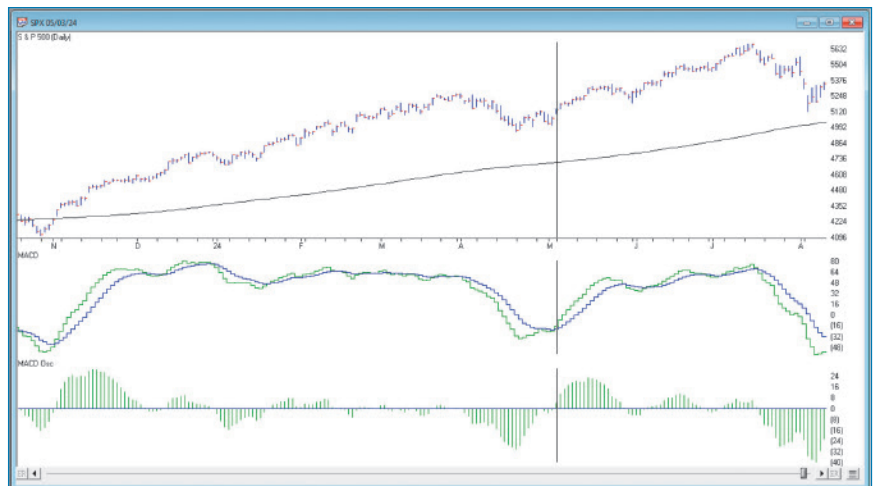


FIGURE 1: LOOKING FOR A DESIRED STOCK SCENARIO. When pursuing a long-dated out-of-the-money calendar spread to trade, we might start by looking for a bullish scenario in a stock with some particular factors and characteristics. In this chart of the S&P 500 index, note the upside reversal following a pullback in a broader uptrend.

However, it does meet the criteria of “looking for an upside reversal following a pullback in a broader uptrend.”

From here, we will use filtering methods built into www.OptionsAnalysis.com software. In Figure 2, we set criteria to look for stocks with an average options bid/ask spread of 2.5% or less and 1,000 or more options traded per day (that is, filtering for a minimum amount of

FIGURE 2: SCREENING FOR STOCK CANDIDATES. This demonstrates looking for stocks that have good option volume and a decent bid/ask spread. Here, we use the filtering methods built into the www.OptionsAnalysis.com software to look for stocks with an average option bid/ask spread of 2.5% or less and 1,000 or more options traded per day in this example.

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A long-dated, far-out-of-the-money calendar spread is an inexpensive way to speculate on a significant move in price.

options traded and a reasonable bid/ask spread).

Figure 3 displays the output. 308 stocks met the criteria, and we saved them in a list called “my stock list.”

Next, we want to look for those stocks with the lowest implied volatility option relative to their own historical range. In Figure 4, we see the input criteria. We look at the 308 stocks in “my stock list” ranked by implied volatility for options with at least 90 days until expiration, lowest to highest.

We see the output for this screen in Figure 5. In the highlighted column, a reading of “0.00” means implied volatility on 90+ day options is at its lowest level in a year. We will arbitrarily select only those stocks with an “IV > 90-day percentile reading of 15.00 or less.”

Note: We are focusing on low IV because it’s desirable to enter into calendar spreads when IV is low. The lower the IV at entry: a) the lower the initial cost to enter the trade, and b) the less the danger of a volatility “crush” (that is, a sudden plunge in IV) hurting our position.

We now have a list of 118 candidate stocks. Now, let’s look for an actual trade.

LOOKING FOR OTM CALENDAR SPREADS

In this example, we are looking for long-term far-out-of-the-money calendar spreads, with the understanding and acceptance that this is a “high risk/high reward” play. The term “high risk” applies because of the

Search Output:

4992 stocks were found and the top 308 that satisfied the search are shown below.

Add the top 308 Stocks to the list: My Stock List

Or overwrite stocks in list and change name to: My Stock List

Rank Checked:

Click a stock symbol to get the Option Data Table. Table Header is fixed. (Allow Table Header to Scroll)

Rank	Name	Stock	Close	Stock Volume (/1000)	Open Interest (/100)	Option Volume (/10)	7-149 day ATM IV	Number of All Options	Bid Ask Spread Avg (% of close)
1	NASDAQ-100 Index Wsdliaz	NDXP	18623.40	0	331	5790	13.50	12256	0.07
2	NASDAQ-100 Index	NDX	18623.40	0	992	352	15.49	4931	0.08
3	Russell 2000	RUT	2048.41	0	7868	9915	17.20	8547	0.14
4	POWERSHARES QQQ	QQQ	453.69	38644	80071	272317	13.86	7714	0.19
5	ISHARES RUSSELL 2000 INDEX	IWM	203.24	32684	96041	126177	15.94	4578	0.28
6	Meta Platforms Inc Class A	META	465.79	11690	20670	30926	28.96	4976	0.34
7	NVIDIA	NVDA	1037.99	82756	29704	269066	43.94	8508	0.37
8	AMAZON.COM	AMZN	181.04	32861	37888	38242	24.37	1846	0.37
9	SPDR GOLD SHARES	GLD	215.72	9368	19809	24115	14.51	2934	0.38
10	ISHARES DOW JONES US HOME CONE	ITB	102.63	2164	1124	3413	24.22	1222	0.39
11	CHIPOTLE MEXICAN GRILL	CMG	3138.28	206	624	546	20.54	5526	0.41
12	Booking Holdings Inc	BKNG	3732.68	217	400	352	22.03	3964	0.41
13	APPLE	AAPL	186.88	50300	48292	60563	18.57	2144	0.48
14	MICROSOFT	MSFT	427.00	16910	19340	20772	18.41	3014	0.49
15	MASTERCARD	MA	451.21	2064	1295	520	15.98	2018	0.53
16	BERKSHIRE HATHAWAY	BRKB	405.88	3359	3323	1621	13.63	1642	0.54
17	ISHARES DOW JONES US REAL ESTA	IYR	85.08	5335	1353	2405	15.67	1074	0.56
18	MERCADOLIBRE	MELI	1707.40	366	332	251	27.76	3284	0.56
19	NETFLIX	NFLX	635.67	3248	4486	7269	20.15	4250	0.58
20	ELI LILLY	LLY	808.45	3017	2202	4534	27.05	3162	0.59
21	COSTCO WHOLESALE	COST	796.34	1516	2300	2394	26.39	3274	0.60
22	VANGUARD REIT INDEX ETF	VNQ	81.80	4060	367	187	15.85	500	0.61
23	APPLIED MATERIALS	AMAT	217.95	5776	2155	2914	29.78	1386	0.61
24	AVAGO TECHNOLOGIES	AVGO	1393.29	3070	2703	4951	34.92	4362	0.62
25	QUALCOMM	QCOM	201.76	13394	6735	13957	27.24	1224	0.62

FIGURE 3: STOCK SCREEN RESULTS. After the screen from Figure 2 is performed, 308 stock candidates met the criteria, saved to a list named “my stock list.”

OPTIONS ANALYSIS

IV Percentile Ranker

OA TOOLS

Backtest date: 2024 / 05 / 23

Update Backtest Date:

Update to: 2024-08-09 14:08 EST

HELP ??

Wizard Criteria:

Number of Calendar Days used for Percentile Ranking: 95

Output Min and Max IV Percentile Values: 0 Min 100 Max

Output Min and Max Stock Close: 10 Min 1000 Max

Searched Stocks:

☐ Stock Symbol: QQQ

☒ Stock Lists: My Stock List

Wizard Rankings:

☐ High IV

☒ Low IV

IVs Ranked:

☐ IV : 7-30 day Options

☐ IV : 30-60 day Options

☐ IV : 60-90 day Options

☒ IV : >90 day Options

☐ IV : 7 - 149 day Options

FIGURE 4: RANKING BY IV. The 308 stock candidates that resulted from the screen are ranked here by implied volatility. For a potential options trade, we are looking for underlying stocks with options that have low implied volatility relative to their own historical range.

relatively low mathematical probability of success versus other potential option strategies (for example, buying more expensive in-the-money calls). However, we are in complete control of determining how much dollar risk we are willing to accept.

In Figure 6 we see input criteria for long-dated out-of-the-money calendar spreads. Our criteria are as follows:

- The strike price we buy must be within +15% to -5% of the current

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stock price

- The option we sell must have between 90 and 180 days left until expiration
- The option we buy must have an additional 21 to 120 days left until expiration
- Any options considered must trade 50 options a day and have an open interest of at least 50
- In considering potential profit and loss, we will assume any option purchased will be bought at the “ask” price, and any option sold will be sold at the “bid” price

(this is for ranking purposes; in real-world trading, we would likely enter a limit order and try to enter at the midpoint price for each option)

We will sort potential trades by *maximum profit divided by maximum risk*.

Figure 7 displays the output from this test. We see that the top-ranked trade involves:

- Buying 1 AAPL Oct18 2024 215 strike price call @ \$1.90

- Selling 1 AAPL Sep20 2024 215 strike price call @ \$1.25

Figure 8 shows the particulars for this position. For this example, if we place a market order, the position will cost (and risk a maximum amount of) \$65 per 1-lot. This is what we will use for example purposes. But note that in real-world trading, we would likely place a limit order that attempts to buy the long call at \$1.88 and sell the short call at \$1.28, for a net cost of \$60 per 1-lot.

So a trader with a \$25K trading

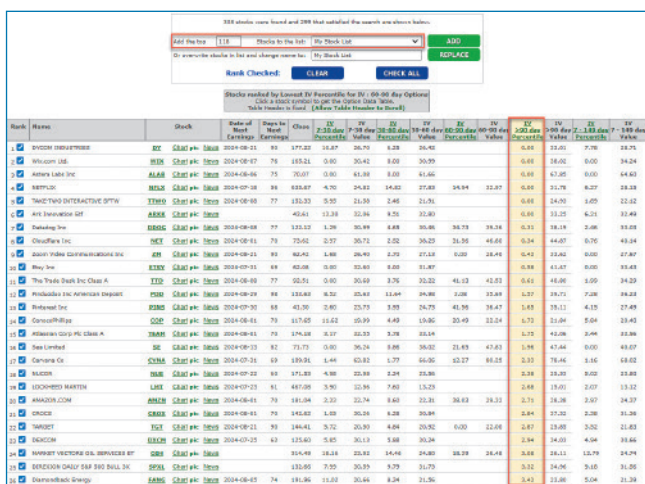


FIGURE 5: CHOOSING THE DESIRED IV. In the highlighted column, a reading of “0.00” means implied volatility on 90+ day options is at its lowest level in a year. From the ranked list, we can select the stocks with the best IV characteristics in the filter results.

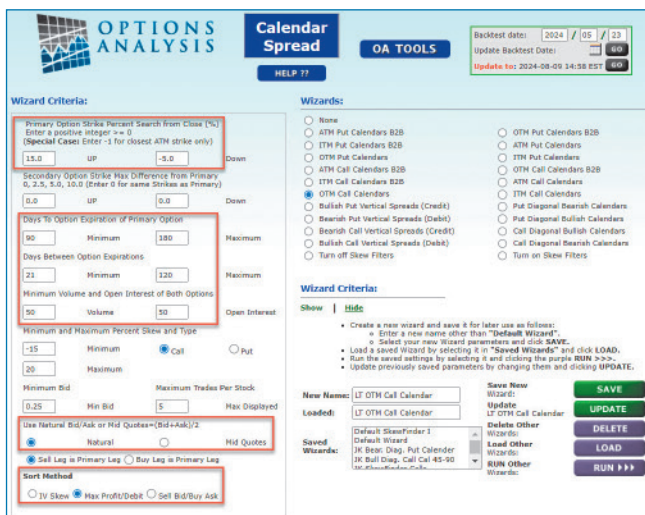


FIGURE 6: SCREENING FOR OPTION CANDIDATES. This demonstrates setting the search criteria for options that may be suitable to use in a long-term far-out-of-the-money calendar spread.

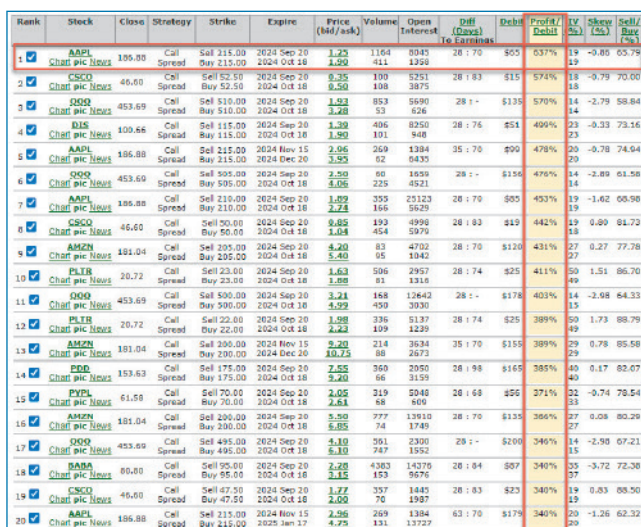


FIGURE 7: OPTION SCREEN RESULTS. After the screen from Figure 6 is performed, the output displays the top-ranked trade candidate based on the input criteria it was given.

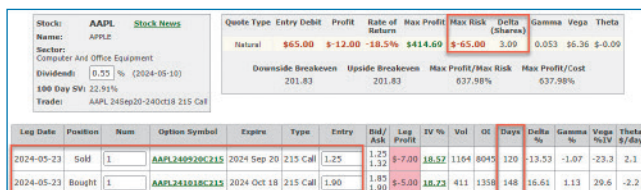


FIGURE 8: TRADE DETAILS, OTM CALENDAR SPREAD. This shows the particulars for the example trade. The OTM calendar spread involves buying a call and selling a call on the same underlying stock at different strikes and with different expirations.

It's desirable to enter into calendar spreads when implied volatility is low.

Explore Your Options



FIGURE 9: RISK CURVES AT TIME OF ENTRY, OTM CALENDAR SPREAD. The risk curves are shown here for the trade depicted in Figure 8. Risk curves show the expected dollar gain or loss based on the price of the underlying stock as of four dates leading up to option expiration. The option expiration date is shown here as the black line in the graph on the right.

account who wanted to risk roughly 1% of their capital on this position could trade a 4-lot, as follows:

$$\$25,000 \times 0.01 = \text{Max risk (approximate) of } \$250$$

$$\$250 / \$65 = 3.85 \text{ (round up to a 4-lot for max. risk of } \$320)$$

If we buy a 4-lot using a market order, the worst-case scenario is a loss of \$260. We have four months (120 days) for AAPL to move to the upside. Figure 9 displays the risk curves for this position at the time of entry. One

thing to note is that the risk curves as of a given top “roll over” if AAPL reaches and begins to exceed the 215 strike price. (“Risk curves” show the expected P/L for this position at a given price for AAPL shares.) So attention must be paid—this is not a “set it and forget it” position.

Figure 10 displays the profit/loss for this position on a daily basis. The column highlighted in the red box displays the expected P/L if we exited the trade using a market order. Note that on June 13, 2024, the open profit was \$75, or 115% of our risk.

Date	Risk Graph Pop Up	Edit Trade	Stock Close	Profit Loss Mid Quotes	Profit Loss Natural Quotes	Delta (Shares)	Theta \$ Per Day	Max Profit	Max Risk	Max Profit/Risk (x)	Upper Breakeven	Lower Breakeven
2024-05-23	Risk	Edit	186.88	-6.00	-12.00	3.42	-0.15	417.07	-65.00	637.98	201.83	201.83
2024-05-24	Risk	Edit	189.98	7.00	0.00	3.72	-0.13	414.24	-65.00	632.98	201.95	201.95
2024-05-28	Risk	Edit	189.99	13.00	7.00	3.90	-0.14	429.89	-65.00	657.07	201.35	201.35
2024-05-29	Risk	Edit	190.29	11.00	1.00	3.68	-0.08	425.78	-65.00	665.12	201.14	201.14
2024-05-30	Risk	Edit	191.29	20.00	8.00	3.71	-0.04	452.92	-65.00	688.76	200.55	200.55
2024-05-31	Risk	Edit	192.33	25.00	11.00	3.88	-0.06	445.54	-65.00	677.59	200.83	200.83
2024-06-03	Risk	Edit	194.03	33.00	25.00	3.85	0.01	454.07	-65.00	693.59	200.42	200.42
2024-06-04	Risk	Edit	194.25	53.00	24.00	4.74	-0.17	447.97	-65.00	684.49	200.65	200.65
2024-06-05	Risk	Edit	195.87	40.00	28.00	3.90	0.04	447.77	-65.00	681.66	200.72	200.72
2024-06-06	Risk	Edit	194.50	37.00	24.00	4.19	-0.05	442.40	-65.00	673.01	200.94	200.94
2024-06-07	Risk	Edit	196.89	45.00	35.00	3.97	0.05	444.69	-65.00	679.70	200.77	200.77
2024-06-10	Risk	Edit	193.12	21.00	10.00	4.05	-0.06	432.96	-65.00	660.90	201.25	201.25
2024-06-11	Risk	Edit	207.15	105.00	15.00	2.77	0.28	458.93	-65.00	664.95	201.14	201.14
2024-06-12	Risk	Edit	213.07	87.00	30.00	1.20	0.63	495.99	-65.00	741.19	199.20	199.20
2024-06-13	Risk	Edit	214.24	92.00	75.00	1.00	0.64	496.29	-65.00	756.20	198.82	198.82
2024-06-14	Risk	Edit	212.49	95.00	80.00	1.35	0.58	484.38	-65.00	729.31	199.25	199.25
2024-06-17	Risk	Edit	216.47	105.00	80.00	0.55	0.68	515.73	-65.00	783.70	198.11	198.11
2024-06-18	Risk	Edit	214.25	55.00	-110.00	1.02	0.84	517.53	-65.00	719.25	199.76	199.76
2024-06-20	Risk	Edit	209.68	95.00	85.00	1.93	0.64	509.05	-65.00	779.30	198.23	198.23
2024-06-21	Risk	Edit	207.49	95.00	65.00	2.59	0.50	483.04	-65.00	729.17	199.51	199.51

FIGURE 10: PROFIT/LOSS, DAILY. The profit/loss for the example position is displayed on a day-by-day basis. We can use this to monitor the position and look for an opportunity to exit with a profit (or adjust the position to lock in a profit).

Attention must be paid—this is not a “set it and forget it” position.

This represents a good opportunity to take a profit—or adjust the position to lock in a profit.

Figure 11 displays the risk curves (based on using a market order) for this trade as of June 13, 2024.

SUMMARY

There is no guarantee that the steps highlighted here will generate winning trades each time they are used. But they help narrow down the field to a handful of potential trades that exhibit the factors (low implied volatility, good option trading volume, tight bid/ask spreads, plenty of time left until option expiration, substantial upside potential, low dollar risk per 1-lot) and the potential to benefit from time decay if the underlying stock moves in the hoped-for direction.

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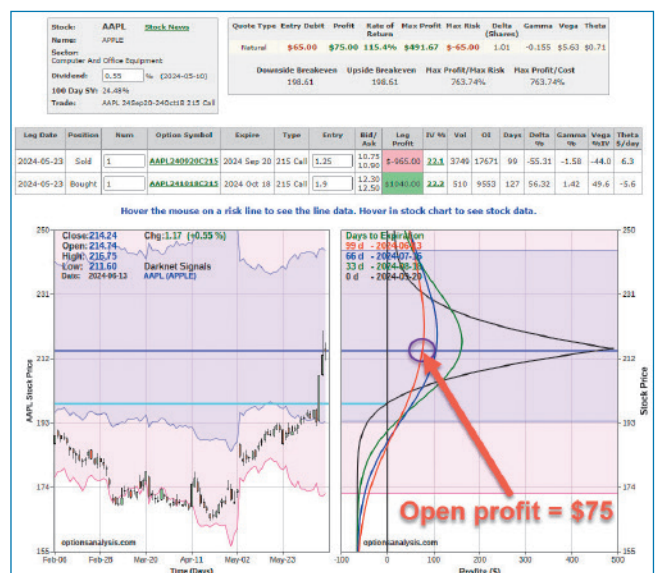


FIGURE 11: RISK CURVES AT TIME OF EXIT, OTM CALENDAR SPREAD. This shows the risk curves for the example trade as of a particular date based on using a market order to exit.



Reliability Reexamination

Do Crash/Recession Indicators Work Anymore?

We have the Tobin's Q, the CAPE10, the Wilshire5000/GDP, the yield curve, zombies...are any of these indicators actually reliable in forecasting economic cycles? Here's a look.

by Greg Aharonian



he indicators are clear: A big market crash/recession is coming. Or small. Or not at all. Or a new bull market economy is beginning. Or not. Time to resort to tea leaves?

In my last article on the Schanep and Sahm recession indicators in the August 2024 S&C,

I discussed two indicators that were suggesting a coming recession. Many financial news sources were pointing to these indicators with the suggestion of an economic downturn ahead. At the same time, others were arguing that these macroeconomic indicators are useless. (For example, one article's title was, "The 'Sahm Rule' Is Every Bit As Ridiculous As Economics.") Claudia Sahm

herself, who designed the indicator, wrote an article last November titled "Why My Recession Rule Could Go Wrong This Time." However, following those articles, the latest employment report of on August 2 triggered the recession levels of the Sahm rule.

So, with these concerns in mind, let's jump into even more indicators, some of which may even be considered "ridiculous" in terms of the information they are currently giving us. (There are plenty of websites with current values and calculators that you can check for these indicators).

TOBIN'S Q

Tobin's Q, applied to individual companies or the market as a whole, is simple and somewhat intuitively useful. For the market as a whole, it is the ratio of the market capitalization of all companies, divided by the replacement value of all companies. Over 1.0, the markets (or stock) is overvalued. Under 1.0, it is undervalued.

In a recent article by Michael Lebowitz titled "Irrational

Exuberance Then and Now,” Tobin’s Q was calculated to be around 1.7 as of the summer of 2024. So it was definitely giving an *overvalued* reading. But the peak at the dot-com crash for the indicator was about 1.45, and the peak during the Great Depression was about 1.38, and we don’t seem to be worse off now than we were then.

SCHILLER’S CAPE10

Schiller’s CAPE10 indicator is a cyclically adjusted (for inflation) price-to-earnings ratio, again seemingly intuitively useful. However, in an article titled “The Schiller CAPE10: How To Use It And Abuse It,” with data on Tobin’s Q, Larry Swedroe writes that the CAPE10 now is around 35, which is *below* the peak of around 45 during the dot-com crash, and only slightly above the peak of about 32 during the Great Depression. So it seems this indicator may not be accurately reflecting where we are now.

S&P 500/200MA vs. M2

Another indicator of the technical analysis type is the S&P 500 index divided by its 200-day moving average, contrasted with the M2 money supply. The S&P 500 is currently well above its 200-day moving average. As an article by Lawrence Lepard titled “Market Moves Like These ‘Have Not Ended Well’” in *Fringe Finance* points out, during the last two market crashes (2000 and 2008), the S&P 500 corrected to its 200-day moving average. That would be approximately a 50% crash if it happened now.

WILSHIRE 5000 TO GDP

The same article by Lepard discusses the ratio of the Wilshire 5000 (a market-capitalization index that tries to capture the entire US stock market). This index is also way above its peak in 2000 and 2008. Both indicators are more consistent with Tobin’s Q than they are with Schiller’s CAPE10.

TEMPORARY UNEMPLOYMENT

An indicator that was somewhat indicative in the recessions of 1990, 2000, and 2008 is the level of temporary unemployment in the US, which quickly declined before these recessions. But now, it seems to be declining slowly enough to not indicate a recession.

However, the *type* of job is important in these analyses. A recent article in *Investor Alert* refers to another jobs-recession indicator, stating: “Recessions are imminent when private job growth decelerates and then declines relative to government job growth.”

INVERTED YIELD CURVE

Entire forests are being destroyed to print articles about whether a longtime favorite recession indicator, the inverted Treasury bond yield curve (the difference between 10-year Treasury yields and 2-year and 3-month yields), is still working, since from 2022 it has been flashing “recession,” which we are probably not in right now. A CNBC article titled “Why An Indicator That Has Foretold Almost Every Recession Doesn’t Seem To Be Working Anymore” by Jeff Cox sums up the confusion, while questioning the Sahm rule as well. However, many recent graphs of the yield curve suggest it’s on track to indicate a recession.

ZOMBIE’S INDICATOR & NEGATIVE EARNINGS

Going in the other direction, a recent online article titled “The Bull Market—Could It Just Be Getting Started?” by Lance Roberts highlights two graphs. The first graph shows that 40% of the companies in the Russell 2000 have negative earnings. Other than during the 2020–2021 pandemic, this is an all-time high, higher than in 2008 or 2008.

The article also graphs the number of “zombie” companies—companies that have debt servicing costs that are higher than their profits. The current level, a bit below 20%, is at an all-time high (greater than the 6% level seen in 2000 and 2008). That seems like it would be bad news for stocks, but the article’s contrarian title about a bull market “just getting started” seems to leave much to wonder about.

THE INDICATORS: FREIGHT DEMAND

If companies are still manufacturing, and consumers are still buying, well then, all of these goods have to be shipped. In a recent article at CNBC’s site titled “No Sign Of U.S. Recession In Freight Demand,” the CEO of shipping giant Maersk expressed skepticism that the U.S. is in a recession, arguing that his company is still seeing robust demand for his freight/shipment services. The article points out that demand for container space from shipping companies is a good indicator of macroeconomic strength.

THAT LEAVES US WHERE?

Confused? So am I. And so are a lot of other people, including analysts, economists, the Fed, and investors.

Which brings up an infamous quip once made facetiously by the late Nobel Prize-winning economist Paul Samuelson, “Wall Street indexes predicted nine out of the last five recessions!” It seems he didn’t have much faith in the stock market’s ability to predict the general

economy. But if there are no other takeaways from this article, here is one prediction I think can be safely made: There will be a lot more volatility in the markets until we decide whether we are heading up or down in any significant way.

Indeed, on August 5, 2024, the VIX spiked over 60. (This spike occurred during a minicrash in stocks due to the yen carry trade unwinding as Japan increased interest rates—who can predict this stuff?) That market event caused huge losses to those who were short the VIX, which had, up till that point, been working as a successful long-term trade.

Considering that market volatility benefits at least two types of companies that I can think of—stock exchanges and brokerage firms, as more people buy and sell stocks, options, and futures during times of volatility—maybe that's where we should consider investing!

A NOTE OF ENCOURAGEMENT

One final note: Keep in mind that since the National Bureau of Economic Research (NBER) only determines the occurrence of a recession months after it actually started, by the time a recession is labeled a recession, the economy could already be recovering and stocks could already be rising. So whenever you hear official declarations of a recession occurring, it just might be time to buy one of the stock indexes.

Gregory Aharonian is founder of KukaXoco Finance. He can be reached at greg.aharonian@kukaxoco.org.

FURTHER READING

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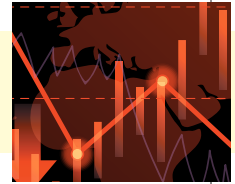
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Confused? So am I. And so are a lot of other people.



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GOT A QUESTION ABOUT USING TRADING STRATEGIES?

Dave Mabe has 25 years of experience in trading strategy development. With a background as a computer engineer and chief technology officer for Trade-Ideas, he is interested in the design of innovative algorithms for rules-based trading systems as well as the intersection of artificial intelligence and finance. He launched DaveMabe.com to help other traders learn how they can improve their trading performance and consistency in results. Through his website he offers a road map for trading strategy development and offers one-on-one coaching. Send your questions or topic suggestions to Dave Mabe at dave@davemabe.com. Selected questions will appear in a future issue of S&C.



Dave Mabe

HOW TO PREVENT TRADING WITH EMOTION

I often let my emotions get the best of me when trading. I know my trading would be better if I didn't let that happen. How can I do that?

I get this question a lot from traders and the answer is different from what you'd think.

Imagine you're in college and you have an upcoming exam in a difficult subject and the professor has given you the list of questions ahead of time. Would you take the exam without bothering to read the questions? If your score on the test is important to you, of course you should thoroughly prepare to give yourself the best possible chance to do well.

If you take the exam without studying, your experience is going to be terribly stressful.

And yet that is exactly what many traders do when they go into the trading day. When you enter a position without knowing exactly how you're going to eventually exit, you're taking an exam without preparing—hoping that things somehow just work out.

When there's money on the line, that's stressful!

Here's a simple exercise you can do to minimize the mistakes that come from your emotions.

During the trading day, take note of every time you find yourself making a decision on the fly that you don't have a plan for. These are situations where you could have confidence if

you prepare ahead of time.

Outside of market hours, take your list and research every time that situation has occurred in your trading. If you're keeping a good record of your trades in an online trading journal (you should be!), assign a tag to these trades so you can quickly identify them. For example, "Indecision." Then you can quickly review charts for all these situations by filtering your trades tagged with *indecision*. Visualize yourself faced with the same decision as you review the charts. What would have been

You'll worry less about the outcome of any individual trade because you're trading with a system.

the right decision to make for each of the trades?

As you study the charts for these trades, you'll notice patterns. Of course, it's impossible to make a perfect decision for each trade. But that's not what's required. You're looking for what works in aggregate across all your previous trades.

The more indecision points you review using this process, the more confidence you'll have when this situation occurs again. You'll know the most profitable action to take that works well across all your trades. You

won't eliminate the emotion itself, but you can prevent the bad outcomes from deviating from your plan, or worse, not having a plan at all.

This is a powerful feedback loop you can use to create a real and lasting trading edge for yourself.

You'll worry less about the outcome of any individual trade because you're trading with a system. Once you systematize your trading, it opens up opportunities to improve further. For example, you can create a backtest for your system and give yourself lots of options for improving it. For more on this, see my article on improving strategies, "How To Improve Any Trading Strategy," in the November 2022 S&C.

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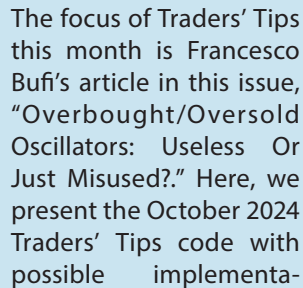


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The code for the following Traders' Tips selections is posted here:

At Traders.com you can also right-click on any chart to open it in a new tab or window and view the chart at a much larger size.

The Traders' Tips section is provided to help readers implement a selected technique from an article in this issue or another recent issue. The entries here are contributed by software developers or programmers for software that is capable of customization.



Function: BAT

TASC OCT 2024
BAT Function: BuFi Adaptive Threshold
Francesco P. BuFi - © 2024 - all rights reserved

```
inputs:
  Price( numericseries ),
  Len( numericssimple );
```

```
Value1 = StdDev( Price, Len );  
Value2 = TLSlopeEasy( Price, 0{1}, Len);
```

```
if Value1 <> 0 then Value3 = Value2 / Value1;  
if Value3 > 0.5 then Value3 = 0.5;  
If Value3 < -0.5 then Value3 = -0.5;
```

BAT = Value3;

Strategy: Adaptive Thresholds

```
{
  TASC OCT 2024
  Oscillators: Useless Or Misused?
  Francesco P. Bufi - © 2024 - all rights reserved
}
```

```
inputs:
  Sys( 1 ),
  RsiLen( 2 ),
  BuyLevel( 14 ),
  EhlersLen( 2 ),
  EhlersLevel( 10 ),
  TrendLen( 200 ),
  UpBuyLev( 12 ),
  DnBuyLev( 4 ),
  AdaptLen( 8 ),
  KAdaptive( 6 ),
  AdaptLen2( 5 ),
  KAdaptive2( 7.2 ),
```

```
AdaptLen3( 5 ),  
KAdaptive3( 7.2 ),  
AdaptLen4( 5 ),  
KAdaptive4( 7.2 ),  
ExitBars( 29 ),  
DollarStp( 1600 );
```

```
variables:  
    Osc( 0 ),  
    Trend( 0 ),  
    Ehlersosc( 0 );
```

```
if Close > Average(Close, TrendLen)
then
    Trend = 1
else
    Trend = -1;
```

```
Osc = RSI(Close, RsiLen):
```

```
if Sys = 1 and Osc < BuyLevel then
  Buy next bar at market: // Tradi-
```

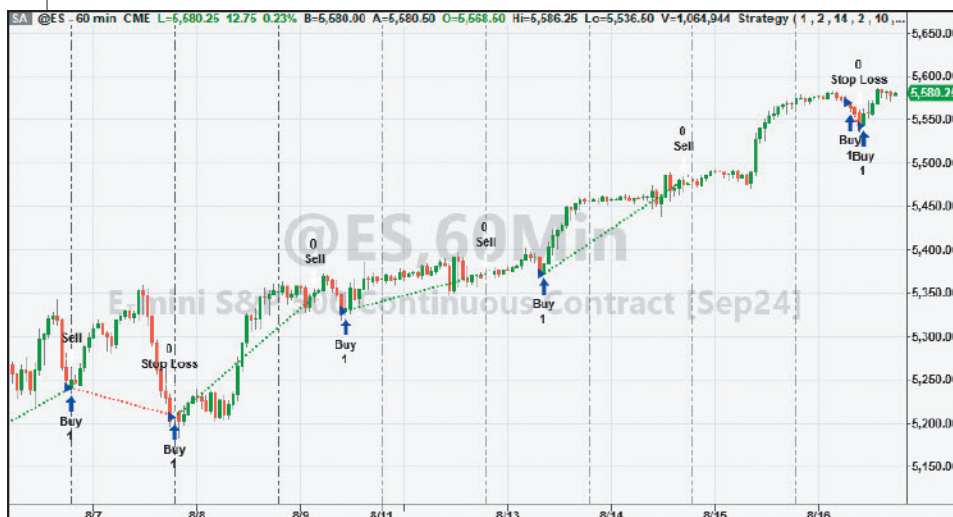


FIGURE 1: TRADESTATION. This 60-minute chart of the continuous emini S&P 500 futures contract (ES) displaying a segment from August 2024 demonstrates the adaptive thresholds strategy applied.



tional way

if Sys = 2 and Osc < BuyLevel and Trend = 1 then
Buy next bar at market; // Trend filtering

if Sys = 3 then
begin // Trend driven levels
if Trend = 1 and Osc < UpBuyLev then
Buy next bar at market;
if Trend = -1 and Osc < DnBuyLev then
Buy next bar at market;
end;

if Sys = 4 and Osc < BuyLevel
* KAdaptive * BAT(Close, AdaptLen) then
Buy next bar at market; // With BAT

SetStopContract;

if DollarStp > 0 then
SetStopLoss(DollarStp);
if BarsSinceEntry > ExitBars then
Sell next bar at market;

A sample chart is shown in Figure 1.

This article is for informational purposes. No type of trading or investment recommendation, advice, or strategy is being made, given, or in any manner provided by TradeStation Securities or its affiliates.

—John Robinson
TradeStation Securities, Inc.
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◆ REALTEST: OCTOBER 2024 TRADERS' TIPS CODE

Provided here is coding for use in the RealTest platform to implement Francesco P. Bufi's technique as described in his article in this issue, "Overbought/Oversold Oscillators: Useless Or Just Misused?"

Notes:

Bufi Adaptive Threshold example
TASC Trader's Tips for October 2024 article by Francesco P. Bufi

Parameters:

```

// version of system to test
Sys: From 1 to 4
// author's defaults for other parameters
RsiLen: 2
BuyLevel: 14
TrendLen: 200
UpBuyLev: 12
DnBuyLev: 4
AdaptLen: 8
KAdaptive: 6
ExitBars: 29
DollarStp: 1600

```

Data:

```

value1: StdDev(C, AdaptLen)
value2: (C - C[AdaptLen]) / AdaptLen // "TLSlopeEasy" calculation
//value2: Slope(c, AdaptLen) // standard linear regression slope function for comparison

```

```

value3: value2 / value1
BAT: Bound(value3, -0.5, 0.5)
OSC: RSIF(C, RsiLen)
Trend: C > Avg(C, TrendLen)

```

Strategy: AdaptThreshTest

Side: Long
Quantity: 1 // contract

EntrySetup: Select(
Sys=1, OSC < BuyLevel, // traditional way
Sys=2, OSC < BuyLevel and Trend, // trend filtering
Sys=3, OSC < if(Trend, UpBuyLev, DnBuyLev), // trend-driven levels
Sys=4, OSC < BuyLevel * KAdaptive * BAT) // author's way with BAT

ExitRule: BarsHeld > ExitBars // time stop
ExitStop: FillPrice - (DollarStop / PointValue) // max dollar loss stop

—Marsten Parker
MHP Trading
mhp@mhp trading.com

TV TradingView

◆ TRADINGVIEW: OCTOBER 2024 TRADERS' TIPS CODE

The TradingView Pine Script code presented here demonstrates the use of a dynamic buy level in an oscillator-based system, as described in Francesco Bufi's article in this issue, "Overbought/Oversold Oscillators: Useless Or Just Misused?" The script presented here based on Bufi's article provides four test systems, all based on the relative strength index (RSI) oscillator but with different entry conditions. The primary focus is on system 4, which applies the author's adaptive threshold formula.

```

// TASC Issue: October 2024
// Article: Overbought/Oversold
// Oscillators: Useless Or Just Misused
// Article By: Francesco P. Bufi
// Language: TradingView's Pine Script™ v5
// Provided By: PineCoders, for tradingview.com

```

```

//@version=5
title = 'TASC 2024.10 Adaptive Thresholds'
stitle = 'AdapThrs'
strategy(title, stitle, false)

```

```

// --- Inputs ---
int sys = input.int(1, options=[1, 2, 3, 4])
int rsiLen = input.int(2)
int buyLevel = input.int(14)
int trendLen = input.int(200)
int upBuyLev = input.int(12)
int dnBuyLev = input.int(4)
int adapLen = input.int(8)
int adapK = input.int(6)
int exitBars = input.int(28)
float dollarSL = input.float(1600)

```

// --- Functions ---



FIGURE 2: TRADINGVIEW. Here's an example of implementing the adaptive thresholds technique on a chart of SPY.

```
// BuFi Adaptive Threshold
BAT(float price, int length) =>
float sd = ta.stdev(price, length)
float lr = ta.linreg(price, length, 0)
float slope = (lr - price[length]) / (length + 1)
math.min(0.5, math.max(-0.5, slope / sd))

// --- Calculations ---
float avg = ta.sma(close, trendLen)
int trend = close > avg ? 1 : -1
float osc = ta.rsi(close, rsiLen)

// Strategy entry rules
```

```
float SL = strategy.opentrades.entry_price(0) - dollarSL
// fixed-bar exit
if exitBars > 0 and nBar >= exitBars
    strategy.close("long", "exit")
// dollar stop-loss
if dollarSL > 0 and ta.crossunder(close, SL)
    strategy.close("long", "Stop-loss")
```

```
// traditional system
if sys == 1 and osc < buyLevel
    strategy.entry("long", strategy.long)
// trend filtering system
if sys == 2 and osc < buyLevel and
trend == 1
    strategy.entry("long", strategy.long)
// trend driven system
if sys == 3
    if trend == 1 and osc < upBuyLev
        strategy.entry("long", strategy.
long)
    if trend == -1 and osc < dnBuyLev
        strategy.entry("long", strategy.
long)
// BAT system
float thrs = buyLevel * adapK *
BAT(close, adapLen)
if sys == 4 and osc < thrs
    strategy.entry("long", strategy.long)
plot(osc, "RSI", color.blue, 1)
plot(sys == 4 ? thrs : na, "Threshold",
color.red, 2)
```

```
// Strategy exit rules
int nBar = bar_index - strategy.open-
trades.entry_bar_index(0)
```

The script is available on TradingView from the PineCodersTASC account <https://www.tradingview.com/u/PineCodersTASC/#published-scripts>

An example chart is shown in Figure 2.

—PineCoders, for TradingView
www.TradingView.com

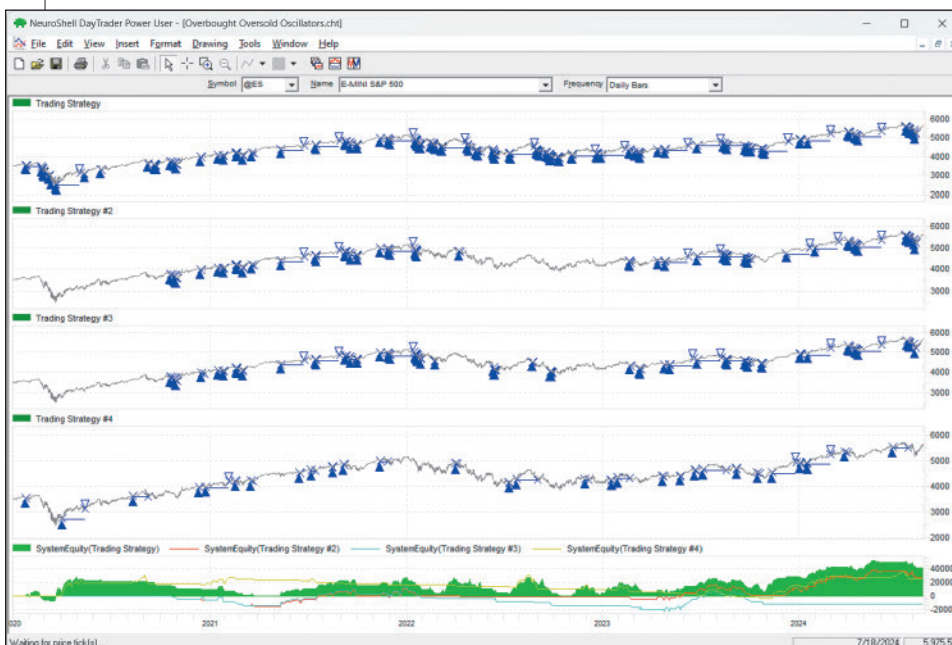


FIGURE 3: NEUROSHELL TRADER. This NeuroShell Trader chart shows the overbought/oversold trading systems applied to the S&P 500 emini contract (ES).



◆ NEUROSHELL TRADER: OCTOBER 2024 TRADERS' TIPS CODE

The overbought/oversold trading systems discussed in Francesco BuFi's article in this issue can be easily implemented in NeuroShell Trader by combining some of NeuroShell Trader's 800+ indicators. To implement the trading systems, select "new strategy" from the *insert* menu and use the trading strategy wizard to create the following strategies:

System #1 – Buy Conditions
BUY LONG CONDITIONS: [All of which must be true]
A < B(RSI(Close, 2), 14)

System #2 – Buy Conditions



BUY LONG CONDITIONS: [All of which must be true]

Price > Avg(Close, 200)
A < B(RSI(Close, 2), 14)

System #3 – Buy Conditions

BUY LONG CONDITIONS: [All of which must be true]

A < B(RSI(Close, 2), IfThenElse(Price > Avg(Close, 200), 12, 4))

System #4 – Buy Conditions

BUY LONG CONDITIONS: [All of which must be true]

A < B(RSI(Close, 2),
Mul3(14, 6, Min2(Max2(Divide(LinTimeReg Slope(Close,
8), StdDev(Close, 8)), -0.5, 0.5)))

All Systems – Stop and Exit Conditions

LONG TRAILING STOP PRICES:

PriceFloorPnts(Trading Strategy #4, 32)

SELL LONG CONDITIONS: [All of which must be true]

BarsSinceFill = X(Trading Strategy #4, 29)

Users of NeuroShell Trader can go to the STOCKS & COMMODITIES section of the NeuroShell Trader free technical support website to download a copy of this or any previous Traders' Tips.

—Ward Systems Group, Inc.
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◆ AIQ: OCTOBER 2024 TRADERS' TIPS CODE

The AIQ code is provided here for Francesco Bufi's adaptive thresholds technique and his four test systems, as described in his article in this issue ("Overbought/Oversold Oscillators: Useless Or Just Misused?").

Since the author optimized the test systems for intraday trading and the AIQ code provided here is based on daily bar trading, the parameters may need to be adjusted to get a realistic test.

!Overbought/Oversold Oscillators: Useless Or Just Misused?

!Author: Francesco P. Bufi, TASC October 2024

!Coded in AIQ by: Richard Denning, 8/17/2024

!!INPUTS:

C is [close].

C1 is valresult(C, 1).

H is [high].

L is [low].

TrendLen is 200.

RSILen is 2.

BuyLevel is 14.

UpBuyLevel is 12.

DnBuyLevel is 4.

AdaptLen is 8.

KAdaptive is 6.

ExitBars is 3.

!BAT:

StdDev is sqrt(variance(C, AdaptLen)).

value1 is StdDev.

value2 is slope2(C, AdaptLen).

value3 is value2/value1.

value3a is iff(value3 > 0.5, 0.5, iff(value3 < -0.5, -0.5, value3)).

BAT is value3a.

!TREND:

SMA is simpleavg(C, TrendLen).

Trend is iff(C > SMA, 1, -1).

!! RSI WILDER

!To convert Wilder Averaging to Exponential Averaging use this formula:

!ExponentialPeriods = 2 * WilderPeriod - 1.

U is C - C1.

D is C1 - C.

W1 is RSILen.

rsiLen1 is 2 * W1 - 1.

AvgU is ExpAvg(iff(U > 0, U, 0), rsiLen1).

AvgD is ExpAvg(iff(D > 0, D, 0), rsiLen1).

rsi is 100 - (100 / (1 + (AvgU / AvgD))).

!SYSTEMS FOR TESTING:

! Sys1:

Buy1 if rsi < BuyLevel.

!Sys2:

Buy2 if rsi < BuyLevel and Trend = 1.

!Sys3:

Buy3 if (Trend = 1 and rsi < UpBuyLevel) or (Trend = -1 and rsi < DnBuyLevel).

!Sys4:

BL is BuyLevel * KAdaptive * BAT.

Buy4 if rsi < BuyLevel * KAdaptive * BAT.

Sell if {position days} >= ExitBars.

ShowValues if 1.

—Richard Denning
rdencpa@gmail.com
for AIQ Systems

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TOMASINI

Continued from page 39

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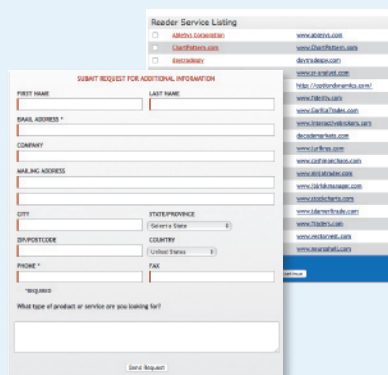
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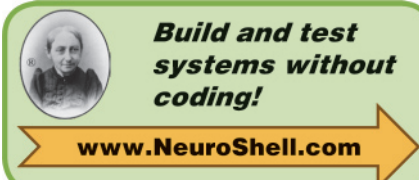
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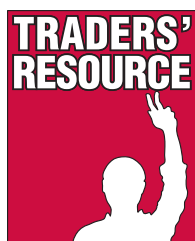
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6. Schwab Active Trading	Charles Schwab
7. Trader's Edge	Trader's Edge
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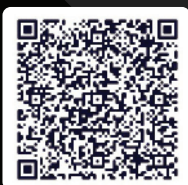
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