S&P & VIX Come Together

The Return Of High Momentum

There's no right or wrong way to look at the market. The reality is that with so many choices, you can get creative with your analysis techniques. Here's a look at how to combine two related indexes and use opposite strategies for each.

by Perry J. Kaufman

A long, long time ago, back in the 1990s, we had a method called *high-momentum trading.* It was a short-term strategy that took advantage of overbought and oversold conditions—not by fading them (selling overbought and buying oversold values), but by *buying* overbought and *selling* oversold situations. It seems contrary to the concept of being overbought or oversold, but it's all about timing.

PROFILING THE MARKETS

In this article, I'll look at two strategies, both based on patterns and with rules that are essentially the opposite. The S&P will be traded as mean reverting and the VIX as high momentum. I'm looking at the same market from two distinct angles—price movement and volatility. But before doing that, it's important to justify the reasoning based on the nature of price movement. I'll use the exchange traded fund (ETF) SPY for the S&P, the VIX index for statistics, and the ETF UVXY for trading.

To understand the difference between these markets, you can add the number of up and down days as well as the average daily moves up and down. The table in Figure 1 shows that these numbers are opposite for SPY and VIX (using data from August

	SPY	VIX
Up Days	3193	2147
Down Days	2769	2452
Avg. Up	0.92	1.11
Avg. Down	-0.99	-0.99

FIGURE 1: AVERAGE UP AND DOWN DAILY MOVES IN SPY AND VIX. From August 1998 through February 2017, the SPY has more up days and VIX has more down days. The average size of the daily moves is also reversed, with the SPY having larger down days and VIX larger up days.

TRADING STRATEGIES

1998 through February 2017). SPY has more up days and VIX has more down days. The average size of the daily moves is also reversed, with the SPY having larger down days and VIX larger up days. You should then expect the rules for a short-term strategy to also be different.

FIGURE 2: SEQUENCES OF RUNS. Here you see that the SPY has runs up of 12 and 14 days, and VIX has runs down of 10 days.
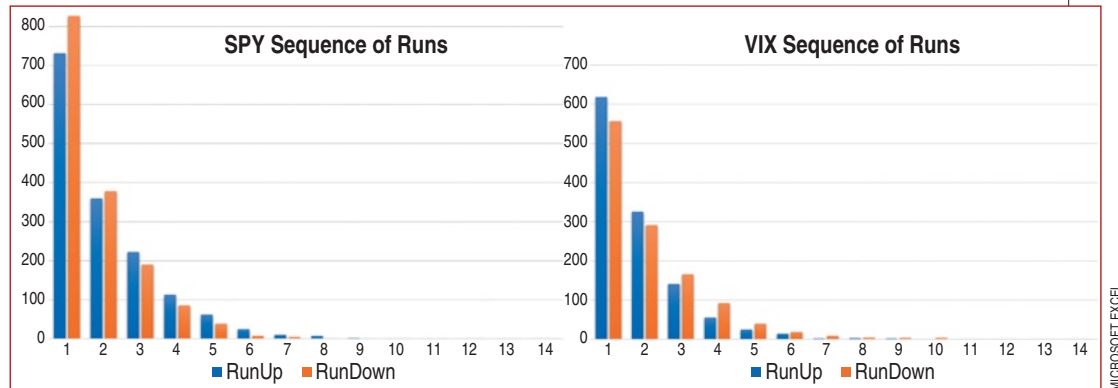
SEQUENCE OF RUNS

The two trading systems are going to use patterns—sequences of up and down days—to trigger signals. It could be helpful to see how these sequences distribute for SPY and VIX. Figure 2 shows the frequency of up and down runs for both markets. For SPY (left chart), there is a larger occurrence of one- and two-day changes of direction to the downside than to the upside; that is, downside sequences tend to be shorter in duration than do upside moves. For the VIX (right chart), it's the opposite, with downside sequences longer most of the time. Also note there are a few very long sequences of runups for SPY and rundowns for VIX.

Let's look at it another way. Figure 3 compares the upward runs for SPY and VIX with a random movement. The longer bar (the rightmost of 3) is the random sequence. For both SPY and VIX there are fewer one- and two-sequence moves than expected with random data. These runs have been shifted to create the fat tail. Upward runs have a very long tail to the right, with one sequence as long as 14 days. For downward runs the tail is not as extreme, but still much longer than any random data would show.
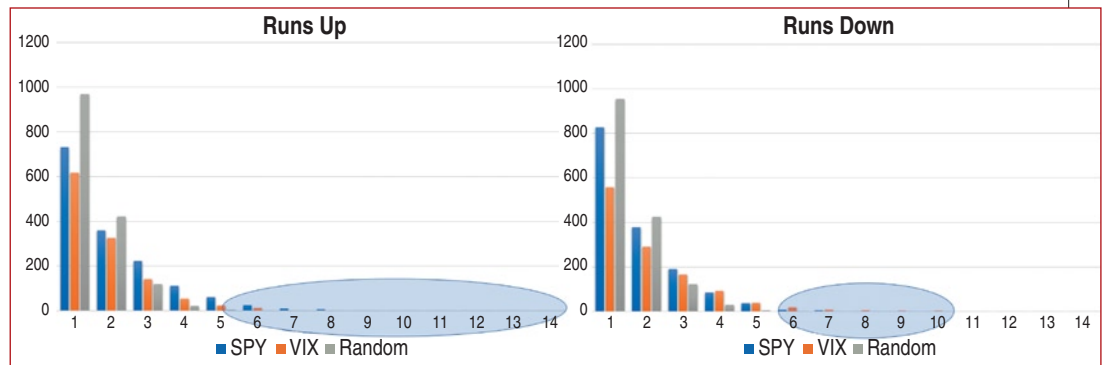
These charts show that the one- and two-day moves are fewer than random, and that the VIX has a bias in the opposite direction from the SPY. For me, that justifies using opposite strategies.
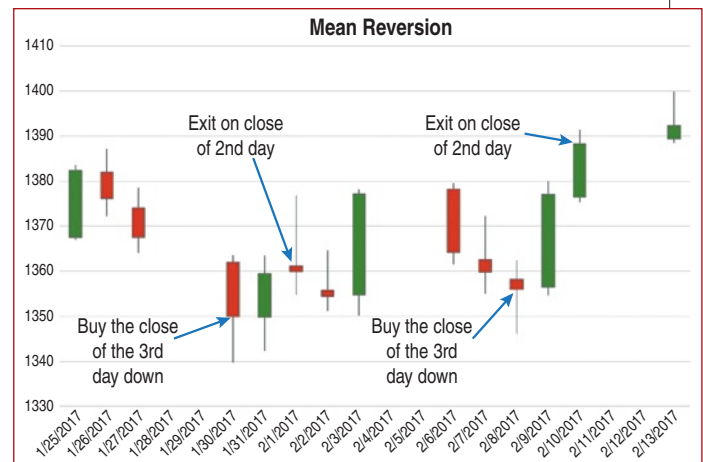
MEAN REVERSION

I'll start with the SPY strategy, based on one of my favorite approaches, the *three-day pattern*, which works well for equity index markets because they have a history of being noisy. I'm going to rename this technique *short cycle* because it will no longer be just three days. Because prices have shifted
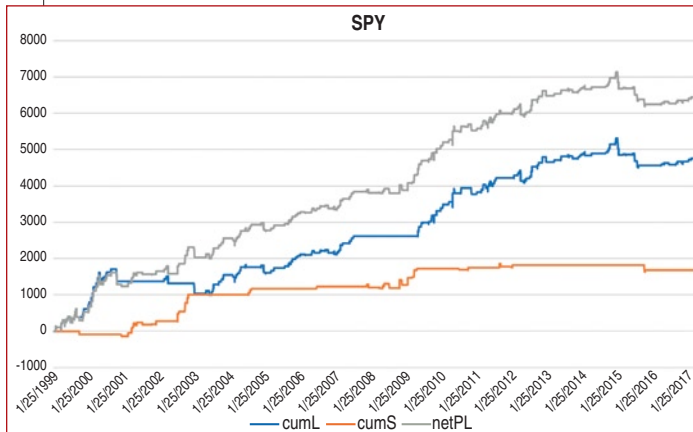

FIGURE 3: DISTRIBUTION OF RUNS COMPARED TO RANDOM DATA. For the SPY and VIX there are fewer one- and two-sequence moves than expected with random data. Upward runs have a very long tail to the right. In the downward runs, the tail is not as extreme but still much longer than any random data would show. These charts show that the one- and two-day moves are fewer than random, and that the VIX has a bias in the opposite direction from SPY.
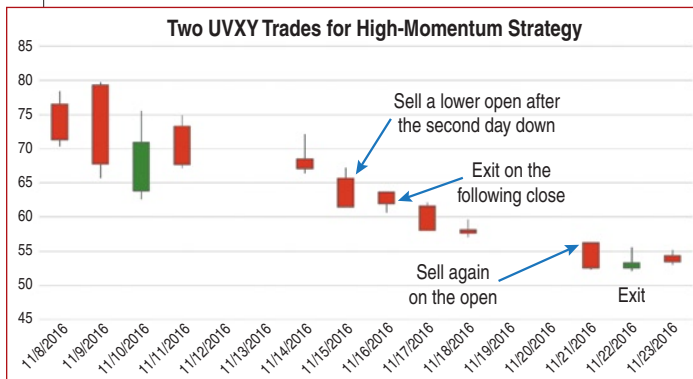

FIGURE 4: EXAMPLE OF MEAN-REVERSION RULES. In each of these examples, the trade is closed out on the second day after entry, although profit-taking will occur for many trades.

away from random in one- and two-day reversals, the index markets favor reversing after day 3 or day 4. I'm going to alter the rules somewhat to favor the long side, for obvious reasons, lengthening the holding period for long positions and lengthening the entry thresholds for short sales. The complete set of rules are:
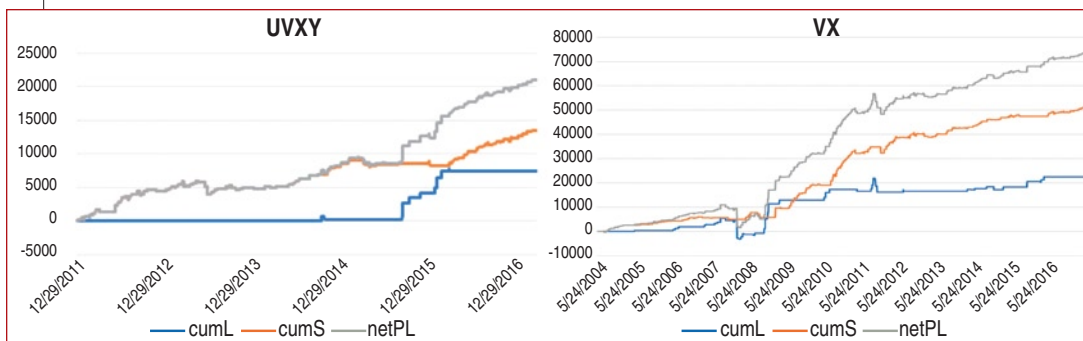
1. Enter long on the third close down, exit on the third close after the entry.
2. Enter short sales on the fourth close up, exit on the second close after the entry.
3. Take profits based on a five-day ATR times a factor of 0.60, added to the entry for longs, and subtracted for shorts.
4. Filter with a 120-day moving average, that is, enter long only when the trend is up, and enter shorts only when the trend is down.

Figure 4 shows two examples of mean-reverting buy signals. Each is closed out on the second day after entry, although profit-taking will occur for many trades.

The results of these rules, applied to SPY from 1998 through February 2017, are shown in Figure 5. The cumulative profits from longs and shorts are shown separately and are based on a $10,000 investment and commissions of $8 per trade. There are many more long trades than shorts. While a return of $6,500 does not seem like a lot, the program is in the market less than 10% of the time; therefore, it avoids a great deal of risk. Futures or options traders could leverage these results.

HIGH MOMENTUM

For the high-momentum strategy, you could use the same basic setup but with a more symmetric threshold for longs and shorts. I'll use the ETF UVXY to trade both long and short. For futures, there is VX, which gives a similar pattern of results but with higher returns and higher risk.

1. After two lower closes, enter a short sale on a lower open or on a lower close (whichever comes first), exit on profit-taking or the day after the entry.
2. After two higher closes, enter a long position on a higher open or higher close (whichever comes first), exit on profit-taking or the day after the entry.
3. Take profits based on a 10-day ATR times a factor of 0.90, added to the entry for longs, and subtracted for shorts.
4. Filter with a 40-day moving average, that is, enter long only when the trend is up, and enter shorts only when the trend is down.

Besides going in the direction of the current price move, these parameters are faster than those used for the SPY mean-reversion approach. It won't be surprising that most of the trades are short sales, which is similar to the way many professional traders sell high

Index markets are notoriously the noisiest of all markets, that is, they have the greatest occurrence of erratic behavior.

FIGURE 5: PROFITS FROM TRADING SPY USING A MEAN-REVERSION STRATEGY. There are many more long trades than shorts. A return of $6,500 may not seem like a lot, but the program is in the market less than 10% of the time; therefore, it avoids a great deal of risk. Futures or options traders could leverage these results.

FIGURE 6: TWO SHORT SALES USING THE HIGH-MOMENTUM STRATEGY APPLIED TO THE ETF UVXY. Most of the trades are likely to be short sales, which is not surprising given the high volatility. Profit-taking will also be frequent.

FIGURE 7: RETURNS OF HIGH MOMENTUM FOR THE ETF UVXY (LEFT) AND FUTURES VX (RIGHT). The long trades using futures have a drawdown of about $5,000 in 2008, but the shorts, which account for most of the trades, show steady gains. The returns of about $70,000 for futures over 13 years are still significantly higher than $20,000 for UVXY over five years.

volatility. Figure 6 shows two trades using UVXY, although profit-taking is also frequent.

The results for this strategy are shown in Figure 7. Profits for UVXY are on the left, but only start at the beginning of 2012. Futures, VX, are on the right and begin in 2004. The long trades using futures have a drawdown of about $5,000 in 2008, but the shorts, which account for most of the trades, show steady gains. The returns of about $70,000 for futures over 13 years are still significantly higher than $20,000 for UVXY over five years.

IT ALL MAKES SENSE

For the pragmatists, that these two approaches have good returns and show consistency should be convincing. For those needing a fundamental explanation of why the index market reacts in the opposite way to its own volatility index, the statistics of up and down price runs should help. Plus, there is a shift from short-term random price movement to create the fat tail.

My own conviction is based on measuring noise. Index markets are notoriously the noisiest of all markets, that is, they have the greatest occurrence of erratic behavior. The 10-day average noise of S&P futures (ES) is 0.31 and VX is 0.35, where a higher value means less noise, more trend. In addition, VX is highly biased to the downside, while ES is biased to the upside. Together, they make a good trading combination.

Perry Kaufman is a trader and financial engineer. He is the author of many books on trading and market analysis, including Trading Systems And Methods, 5th ed. *(with the first edition published in 1978 as a seminal book in the field of technical analysis), and most recently,* A Guide To Developing A Successful Algorithmic Trading Strategy *(2016). For questions or for more information, visit his website at www.KaufmanSignals.com.*

FURTHER READING

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†*See Traders' Glossary for definition*