Three Faces of the Macro-Trend Analyzer

Richard "Doc" Ahrens

The objective of using the MTA is not to improve our returns by taking on more risk. The objective is to improve returns by taking on **less risk**.

Trader and author Bill Williams introduced an indicator called the Alligator in 1995 that used three averages: a 5-day, an 8-day, and a 13-day. 5, 8, and 13 are consecutive numbers in the Fibonacci sequence, which is often used to create non-harmonic averages. When I was searching for a reliable, long-term indicator it occurred to me that the Alligator might work on a longer time frame, so I changed the time scale from days to weeks and shifted the periods to three larger Fibonacci numbers, 13, 21, and 34. So the Macro-Trend Analyzer (MTA) is similar to a very large Alligator.

This paper details three different "tests" (i.e., ways to interpret what the MTA is telling us).

The original Alligator was bullish when the fast average was on top, the medium average was in the middle, and the slow average was on the bottom. And it was bearish when the fast average was on the bottom, the medium average was in the middle, and the slow average was on top. If the averages were not in bullish or bearish order, then it was a good idea to sit on the sidelines and wait until the market picked a direction. I used that same approach for what I called the "strict" test.

The Strict Test is somewhat slow to identify emerging trends. A second way to detect trend shifts is by using the slopes of the three averages. This method signals an advance when all three averages are rising and it signals a decline when all three averages are declining. It is referred to as the "3-Slope Test".

A third way of indentifying emerging trends is when the closing price is above the slow average and middle average is rising, it is a signal that the trend has turned up. When the closing price is below the slow average and the middle average is falling, it is a signal that the trend has turned down. This method is simpler and more responsive than the other two tests. It is called the "Simple Test".

In order to compare the three methods, a program was developed to see how the Strict Test, the 3-slope Test, and the Simple Test would have performed over the last 20 years. In the last two decades we have had two serious bear market declines and a couple of long-term advances so these two decades provide us with a variety of market types and conditions.

Here are the results comparing the returns of the three different MTA methods on SPY, the S&P 500 Index ETF. Purchasing SPY (the S&P 500 ETF) on Feb 2, 1998 for $99.94 and holding it until Apr 18, 2019 would have seen it grow to $290.02, so in 21 years it would have increased by a factor of 2.9 (190%).

Strict Test

If you had moved your money into SPY when the Strict Test said to buy and moved your money back into cash when the Strict Test said to get out of SPY, you would have been invested in SPY 14 times and your money would have grown from $99.94 to $360.44 (261%).

With the Strict Test MTA your average time in the market would have been 262 days and you would have made an average of 12.1% on each investment. There would have been 2 losing trades, but your worst loss would have been only 2.1%, which is far better than the ~50% drop in the bear market in 2002 and the ~57% decline in 2008.

In addition to beating the market by a little over 24% in the last two decades, there is another reason to go through the work of moving your money around from time to time. While the buy-and-hold folks were enduring those huge bear market declines, you could have invested your money somewhere else, making small but steady returns in T-Bills or other safe investments. That would have put your total returns even farther ahead in the long run.

3-Slope Test

For SPY, the 3-Slope Test produced better results than the Strict Test. With the 3-Slope Test you would have bought and sold SPY 18 times. The average holding period for SPY would have been 207 days and the average return would have been 9% each time. The average loss would have been 2.5% and the worst loss would have been 4.2%. The overall return would have been a factor of 4.54 (354%), which would be an average return of just over 8.5% per year.

Simple Test

The Simple Test did even better than the 3-Slope Test, but it would take more work, too. The Simple Test produced 86 trades with an average holding period of just 35 days. The average return on each trade was 2.7%, the worst loss was 3.7%, and the overall return was 16.14 (1514%). That means it would have returned 5.56 times as much as you would have made doing buy-and-hold investing in SPY.

Tabular Comparison

SPY - MTA Strict Test - Long Trades	
Average Days in Position	262
Expectation Per Trade	10.1%
Number of Wins	12
Average Amount Won	12.1%
Number of Losses	2
Average Amount Lost	2.1%
Worst Loss	2.1%
Total Return in 21 years	3.61 (261%)

SPY - MTA 3-Slope Test - Long Trades	
Average Days in Position	207
Expectation Per Trade	9.0%
Number of Wins	13
Average Amount Won	13.4%
Number of Losses	5
Average Amount Lost	2.5%
Worst Loss	4.2%
Total Return in 21 years	4.54 (354%)

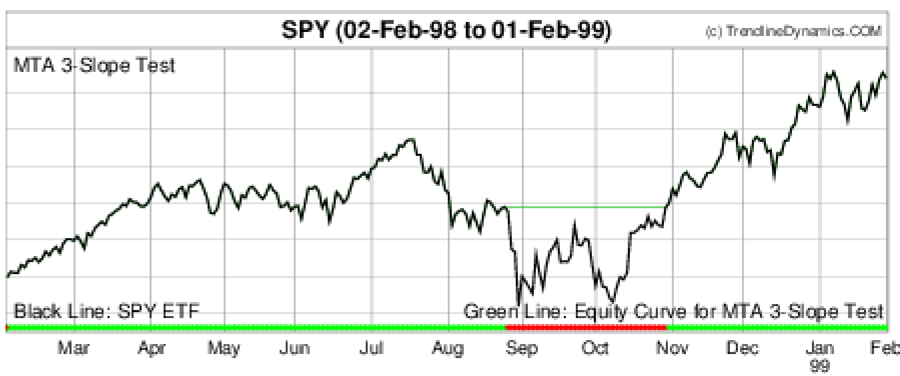
SPY - MTA Simple Test - Long Trades	
Average Days in Position	35
Expectation Per Trade	2.7%
Number of Wins	55
Average Amount Won	4.9%
Number of Losses	31
Average Amount Lost	1.2%
Worst Loss	3.7%
Total Return in 21 years	16.14 (1514%)

Equity Charts

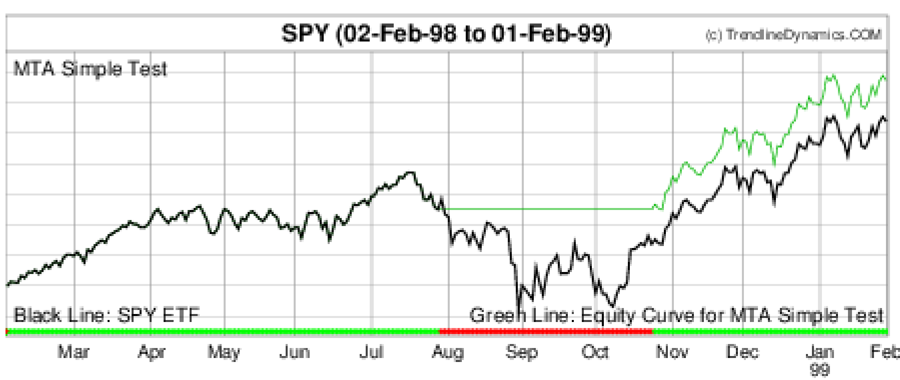
Here are the charts for SPY from Feb 2, 1998 to the present. Each page shows the charts for all three MTA tests for a single year, so you can compare the way the three tests respond to different market conditions. An equity chart shows how much an investment is worth through time. The charts that follow assume a buy-and-hold investment made in the SPY ETF (the black line) and an actively managed investment using MTA signals (the green line). Both investments start with $100 on 2-Feb-98, the day that SPY crossed the $100 price level. If the green line cannot be seen, it is because it is being covered by the black line.

The Strict Test equity curve matches SPY exactly until September, so its green line is hidden behind the black SPY line. The green MTA line becomes visible when it diverges from SPY.

The 3-slope Test responds a little more quickly to the decline in SPY, so its green line does not become visible until late August. Then it disappears as it again follows SPY in late October.

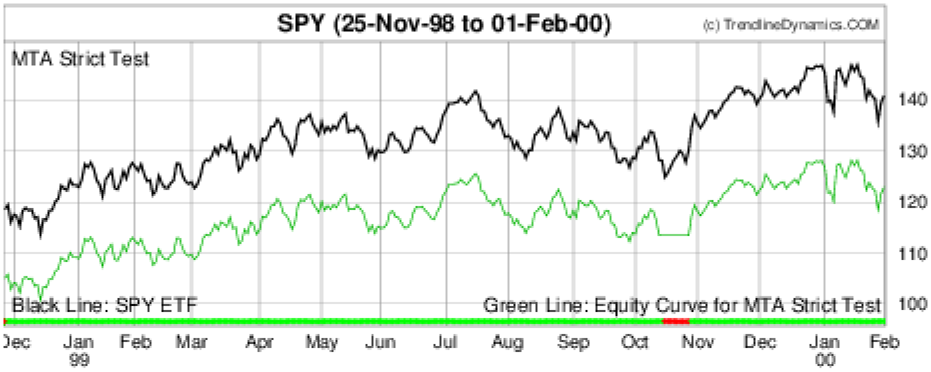


The Simple Test responds even more quickly, so the MTA becomes visible in late July.



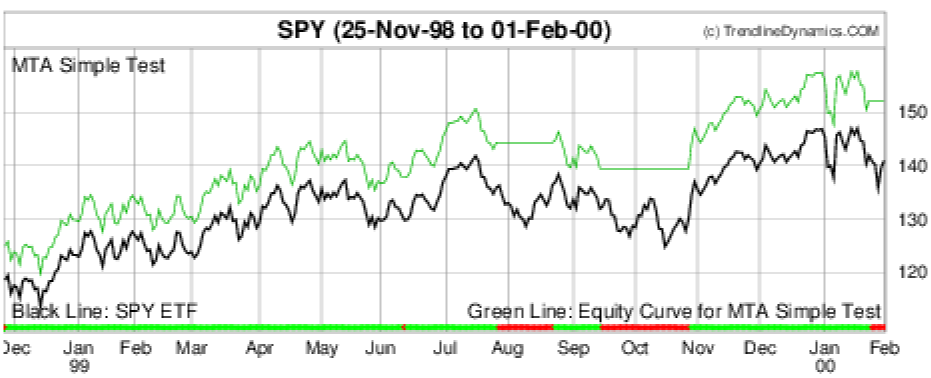
1999 Charts

After falling behind in 1998, the Strict Test trails SPY in 1999.



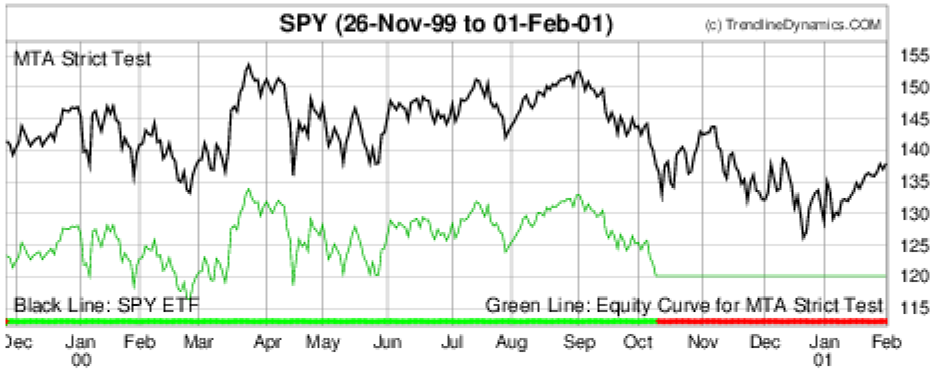
The 3-Slope Test tracks SPY for most of 1999, then disconnects in October.

The Simple Test, which pulled a little ahead in 1998, moves a little further ahead in 1999.



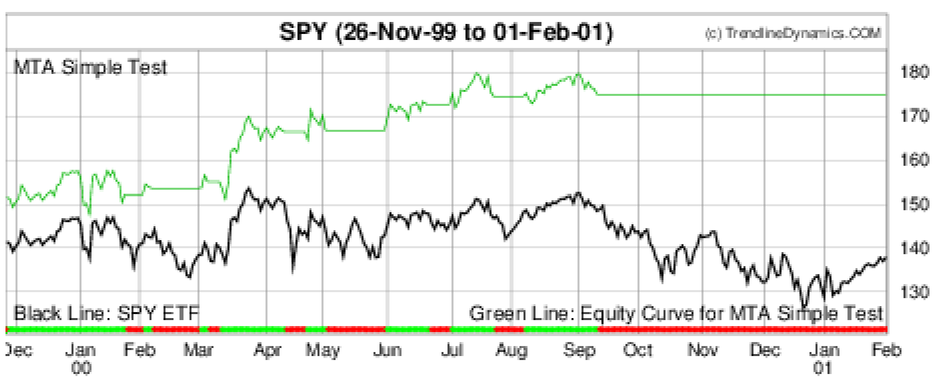
2000 Charts

Even though it is below SPY, the Strict Test goes to cash in October as SPY starts to decline.



The 3-Slope Test does the same.

Being more sensitive, the Simple Test exits and then re-enters the market 7 times as the bull market of the 90s loses momentum and goes sideways in 2000. Then it exits in September and stays out as SPY starts to decline in earnest. Those short out-and-in changes may seem a nuisance, but they will pay off in the long run. BTW, if these short-term switches make you worry about commissions (because you're paying more than $5 per trade) you are using the wrong broker.



2001 Charts

As the market collapses from over $150 to its eventual bottom below $80, all the MTA tests keep you on the sidelines, calmly collecting interest from bonds or T-bills.

Again, we see a few flickers of green from the Simple Test. These turn out to be in-and-out for the same price or a loss of less than 1%. It's the price you pay for being among the first back into the market when it hits bottom.

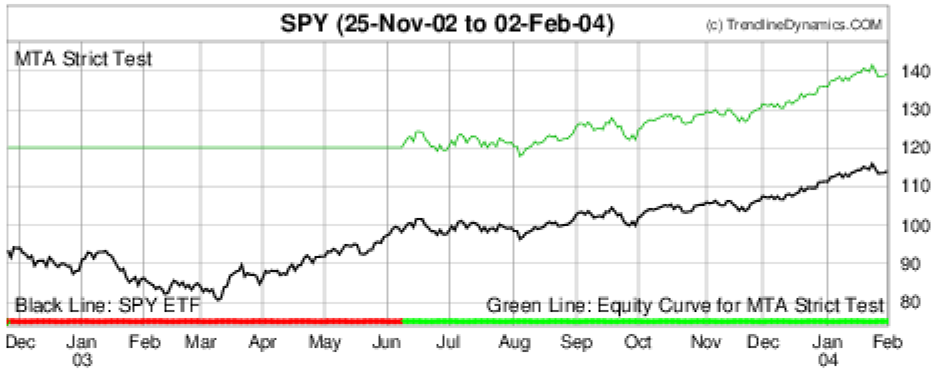
2002 Charts

As the Dot-Com bear market grinds to a bottom in October 2002, the MTA keeps you out of harm's way.

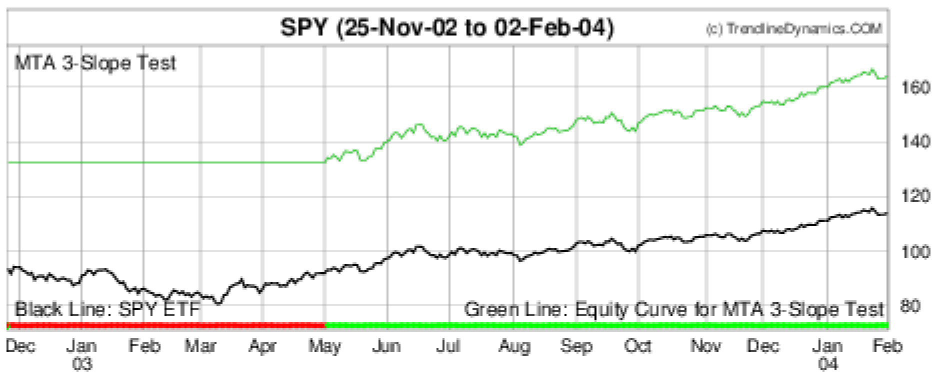
Some of the interim rallies are big enough to cause the Simple Test to go green here and there.

2003 Charts

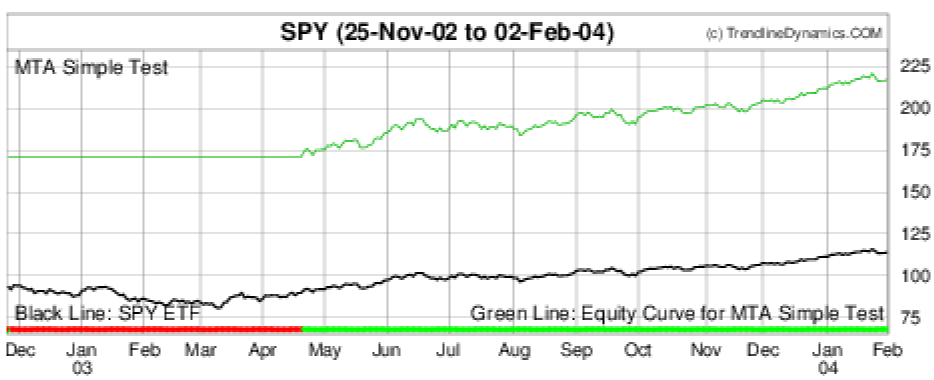
In 2003 the market starts to recover. The Strict Test sends a buy signal in June, which is when most investors are just starting to get over the fright of watching their investments get cut in half — but they are not ready to trust the market yet.



The 3-Slope Test signals a buy near the 1st of May.

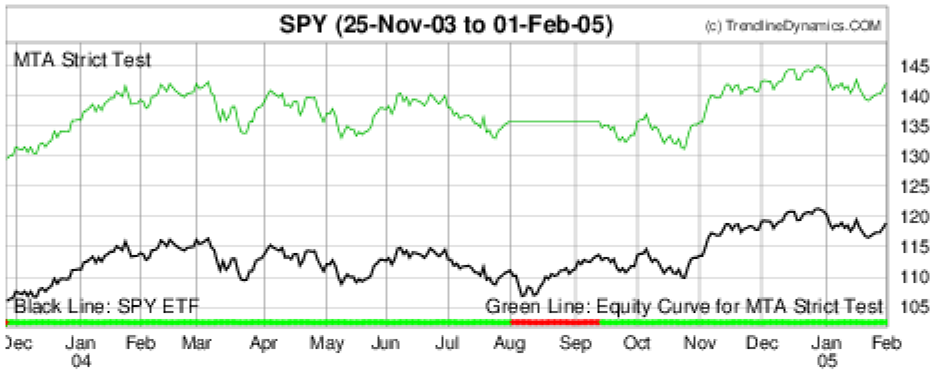


A buy signal comes from the Simple Test in April. Once you realize that the market is in a long-term decline, one way to sidestep unproductive short-term signals from the Simple Test would be to wait for confirmation from the 3-Slope Test.

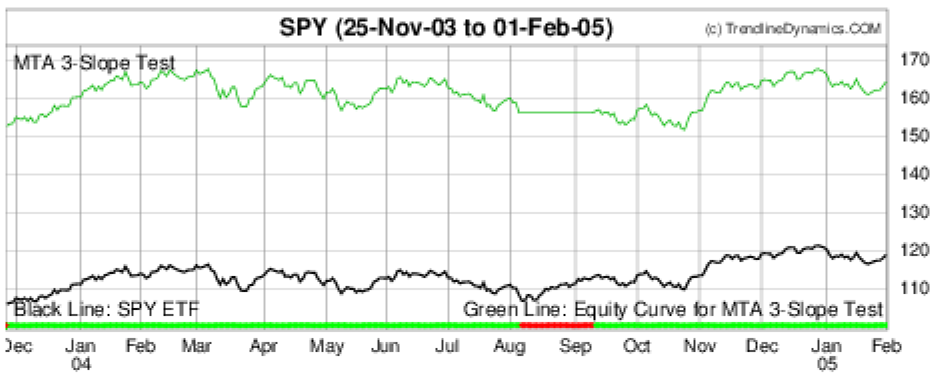


2004 Charts

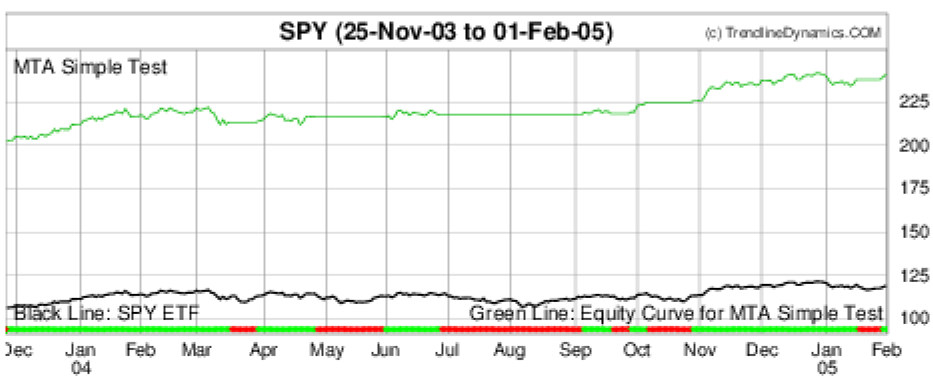
Despite rallying during the second half of 2003, most of 2004 is flat, and many investors fear another major decline. The Strict Test signals a short period to go to cash in August and September.



The 3-Slope Test also signals a month of danger in late summer.

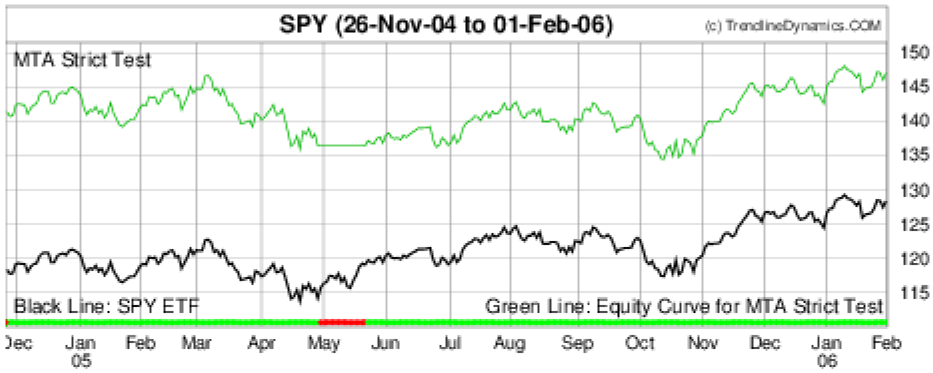


The Simple Test issues several exit and buy signals, wringing small profits out of a market that is largely flat during 2004.

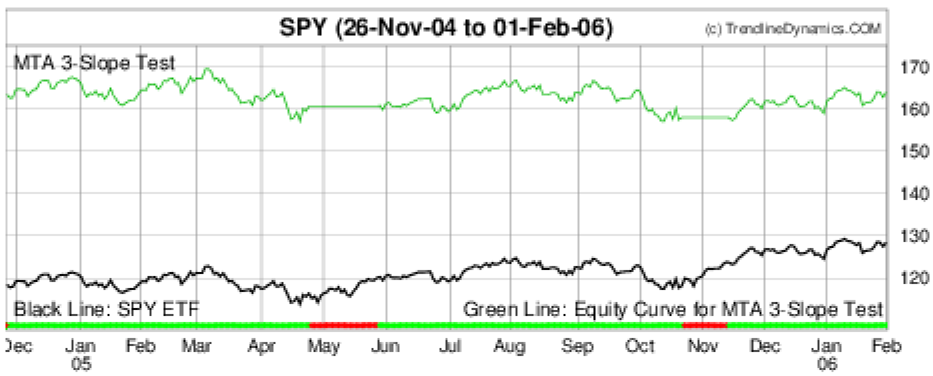


2005 Charts

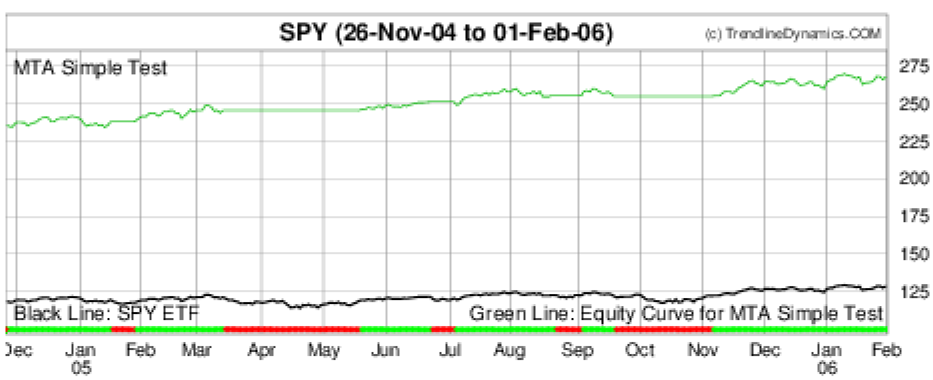
After 8 years, SPY has risen over 25% from $100 to over $125 by the end of 2005. Meanwhile the MTA Strict Test has risen 45% to over $145, over 15% more than SPY itself.



The 3-Slope Test has outdistanced SPY by 25% at the start of 2006.



Meanwhile the Simple Test, with all that seemingly meaningless out-and-in switching, has grown to twice the price of SPY by 2006.

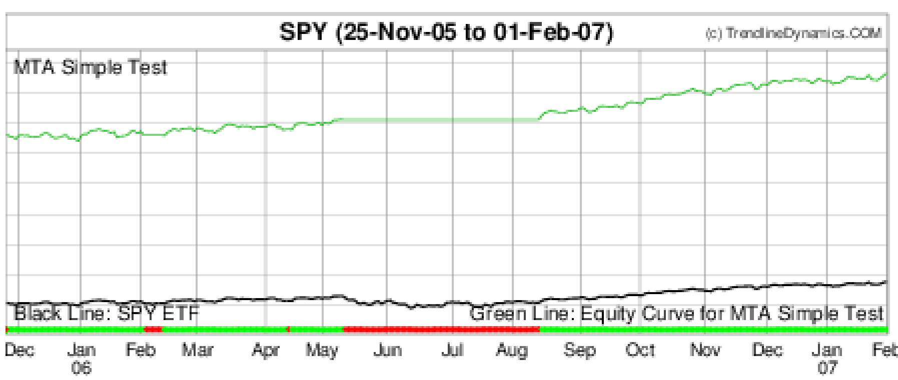


2006 Charts

In the second half of June, the Strict Test signals an exit, then a re-entry in mid-August.

The 3-Slope test matches the Strict Test.

After a couple of flickers in February and April, the Simple Test gets out in the first half of May and stays out until almost the middle of August.

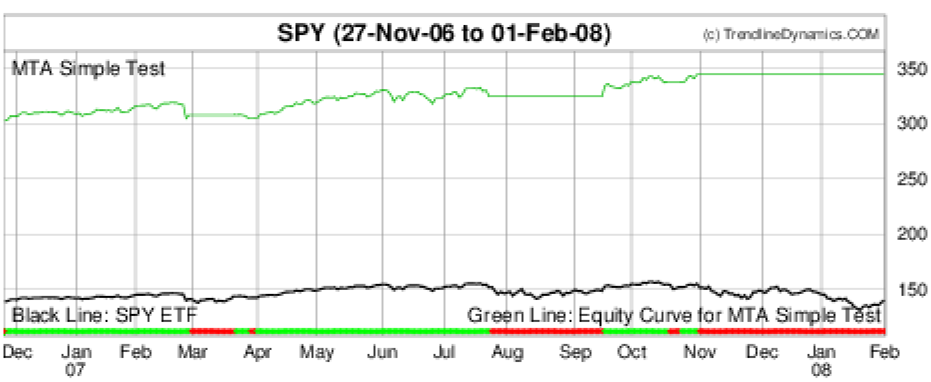


2007 Charts

The Strict Test is in the market for most of the year, steps out for 2 weeks in late November, then gets completely out in early December.

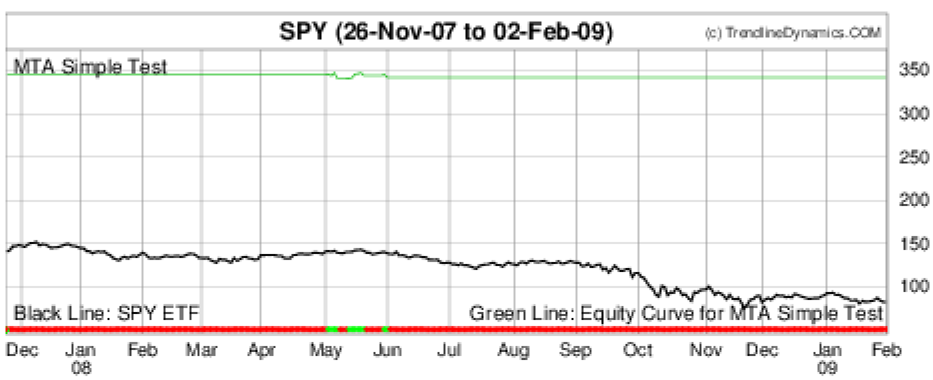
The 3-Slope Test gets a little out of sync due to a rapid decline in July and ends up out of the market during parts of August and September. Then it correctly gets out in mid-November.

The Simple Test spends most of March on the sidelines. It reacts to the mid-July decline, getting out in late July and reentering in mid-September. There was a quick exit-entry in October and then an exit near $150 on November 1st.



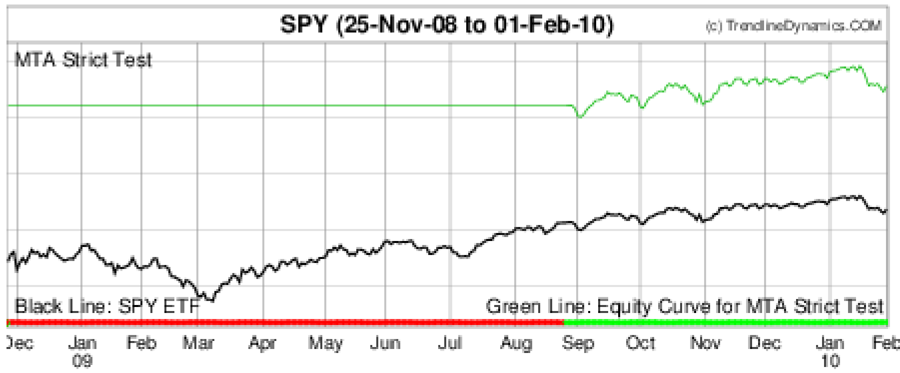
2008 Charts

Aside from occasional flickers, all three tests are out for all of 2008 during the Sub-Prime Lending market crash. The market hits a low of $75.49 on November 20, then seems to start to recover.

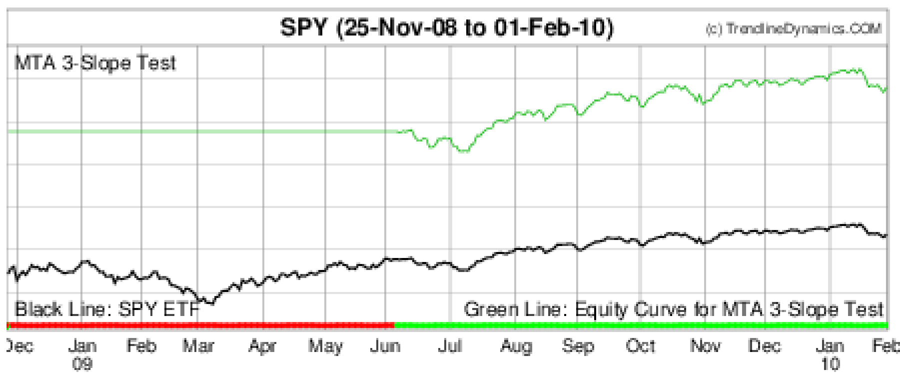


2009 Charts

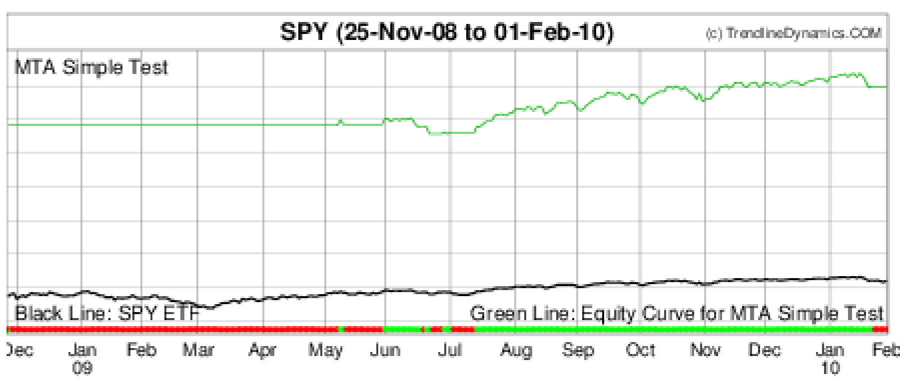
The market makes its final low of $68.80 on March 5th of 2009. The Strict Test takes about 6 months before signaling the all-clear in September.



The 3-Slope Test signals a buy 2 months earlier, in June.

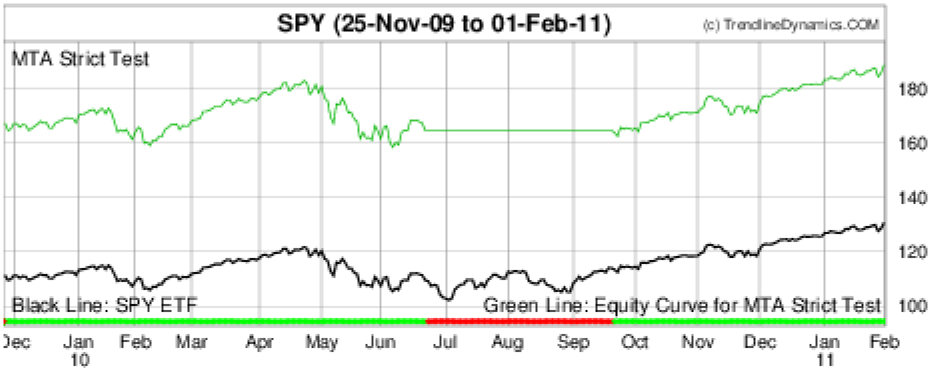


The Simple Test switches on and off several times, then comes on in the first half of July.



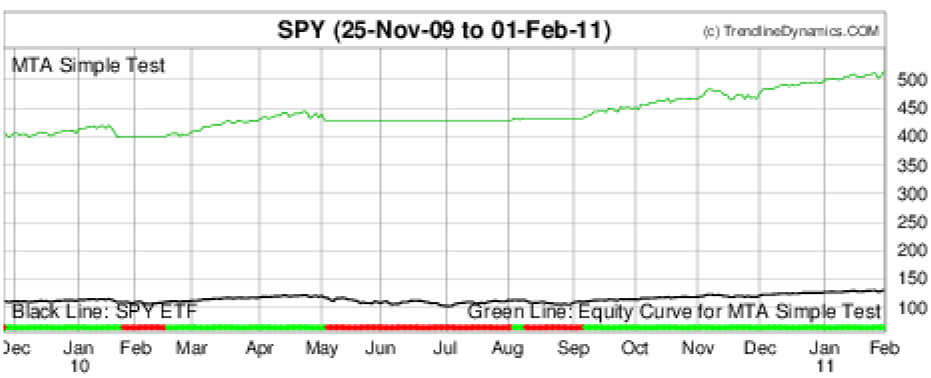
2010 Charts

In 2010, the Strict Test is out of the market from late June to early September.



The 3-Slope Test is out from early June to about the 10th of September.

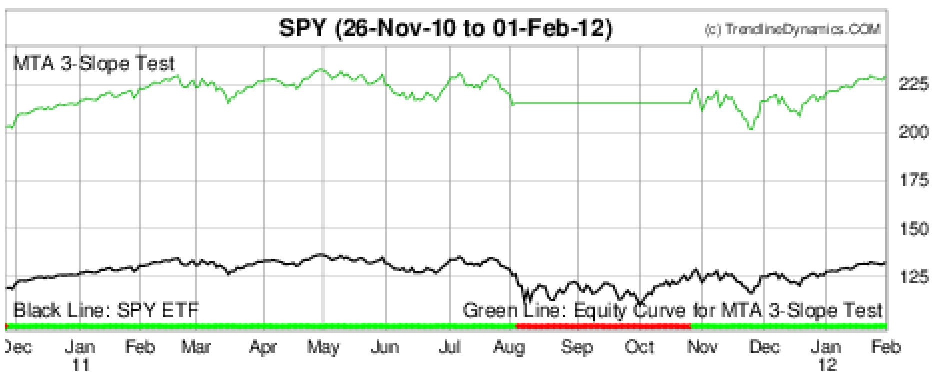
The Simple test is out for nearly four months, May through August. It is also out for a few weeks from late January to mid-February.



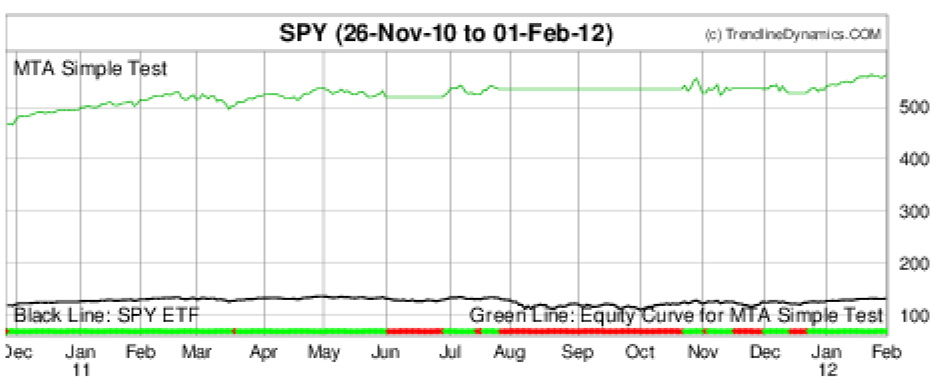
2011 Charts

By August 2011, SPY looks like it is headed into another serious decline and the Strict Test exits in early August.

The 3-Slope Test exits about the same time as the Strict Test, but exiting two days earlier makes a visible (5%) difference between the two tests.

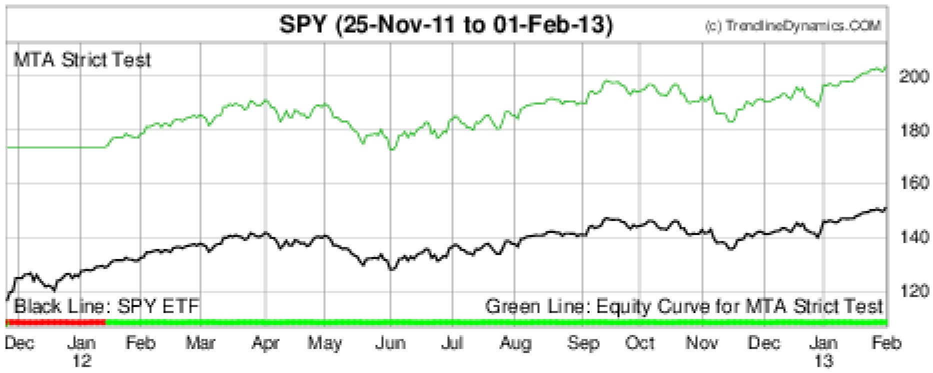


Since SPY is very close to level for much of 2011, it creates a situation where the Simple Test is switching in and out. Even so, the Simple Test captures 8.3% of gains while SPY only advances 0.3% during the year.

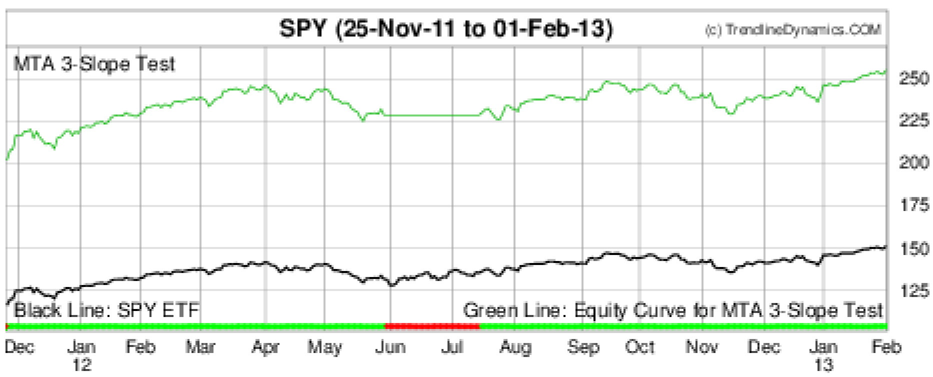


2012 Charts

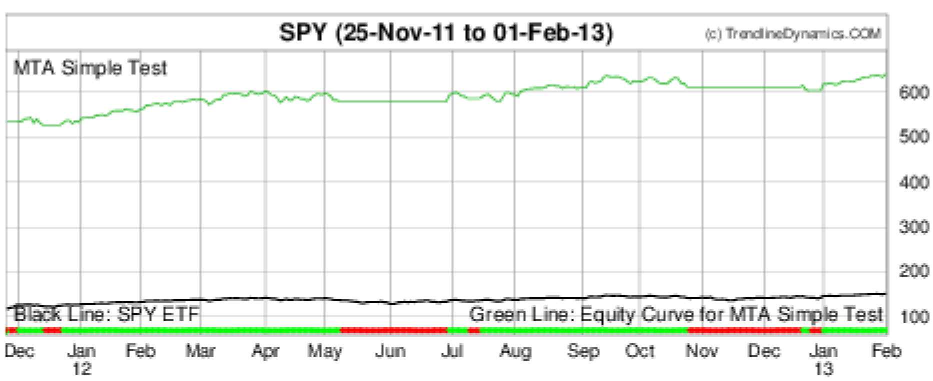
The Strict Test stays long from the first half of January. By the end of the year, it is ahead of SPY by almost 35%.



The 3-Slope Test remains long throughout the year except for a 6-week period starting in late May. It finishes the year 68.7% ahead of SPY.

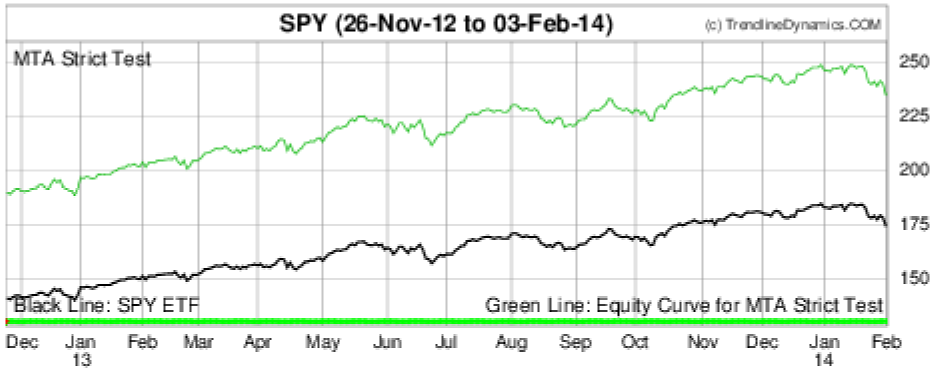


The Simple Test captures $77.50 in gains during the year. By the end of 2012, the Simple Test ($619) is ahead of SPY ($146) by a factor of 4.24 (324%).

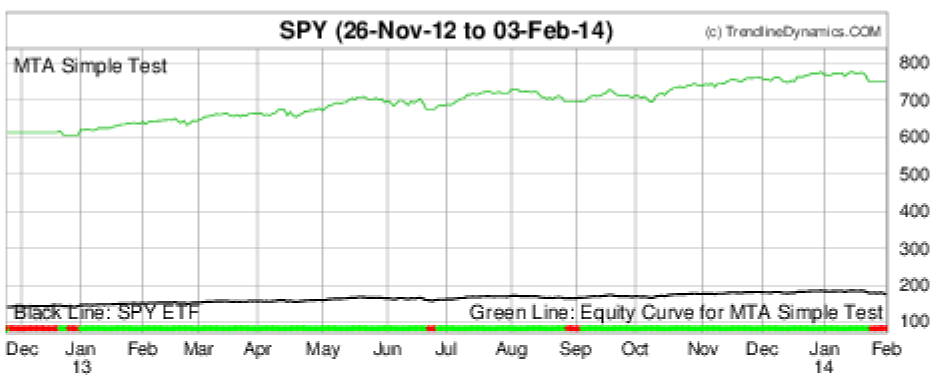


2013 Charts

The Strict Test and the 3-Slope Test remain invested in SPY throughout 2013.

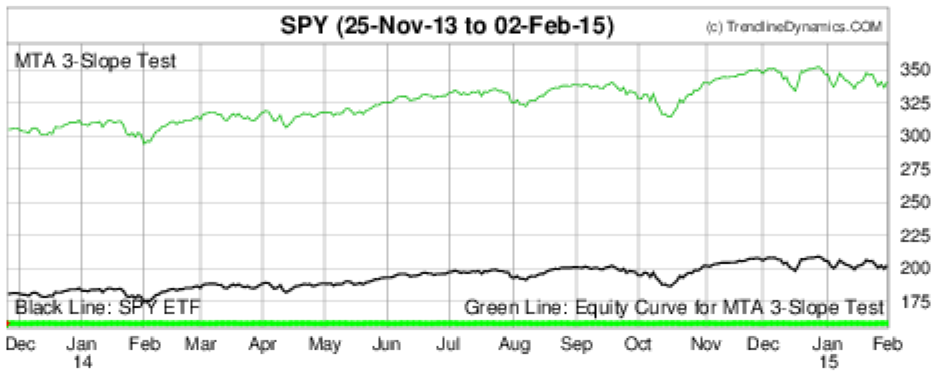


During 2013, the Simple Test is out for a few days in June and about a week in late August.

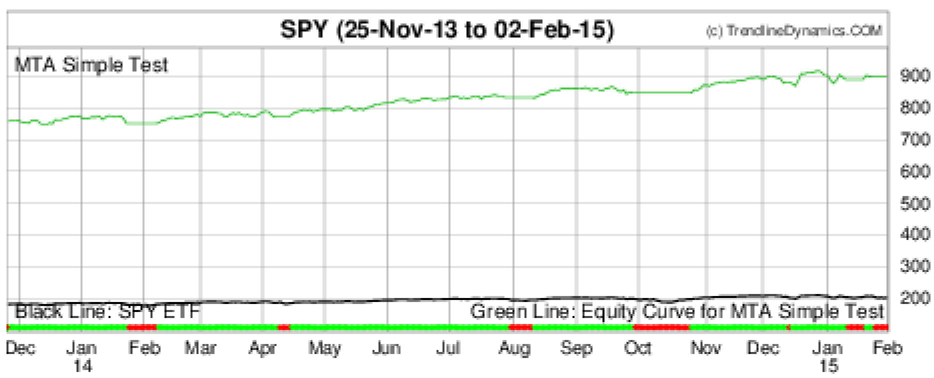


2014 Charts

Like 2013, the Strict and 3-Slope Tests remain invested in SPY.

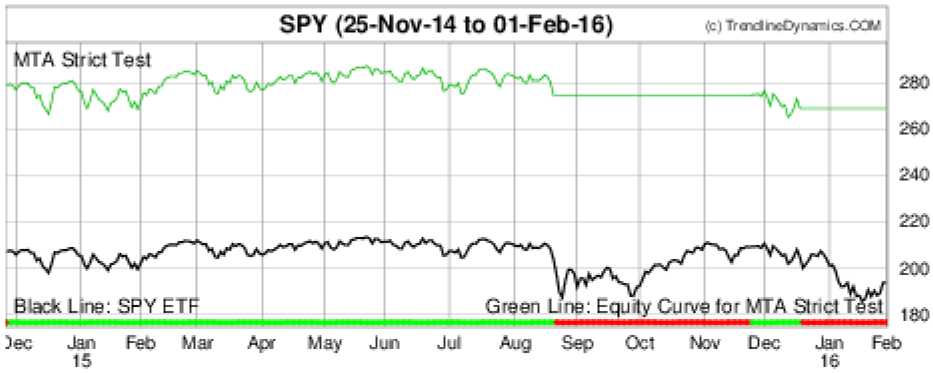


The Simple Test is out of SPY 5 times during 2014, and it continues to pull ahead by avoiding small drops like the 7.7% decline in SPY from 18-Sep-2014 and 16-Oct-2014.

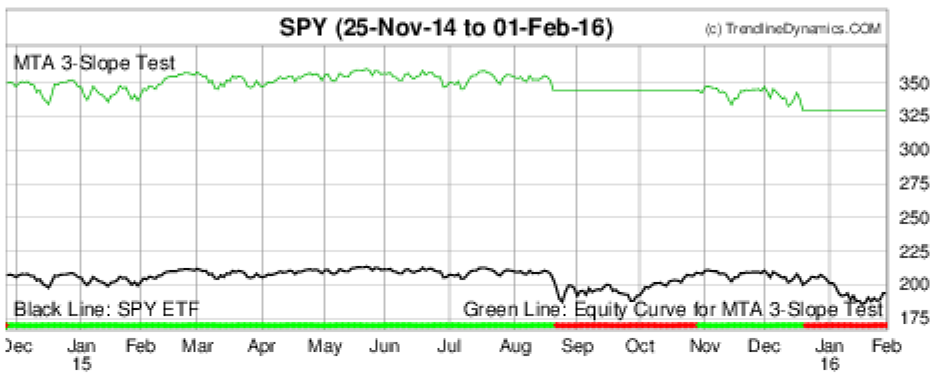


2015 Charts

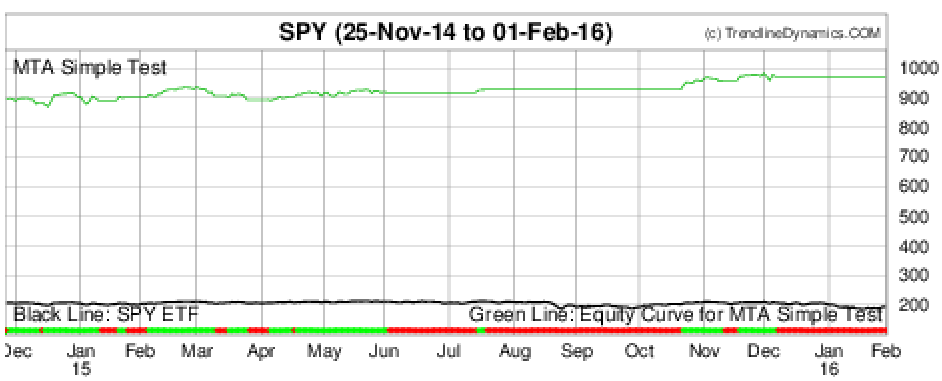
The Strict Test bails out of SPY when the market starts dropping in late 2015. Then it stays out except for a few weeks in November-December.



The 3-Slope Test behaves in a way similar to the Strict Test.

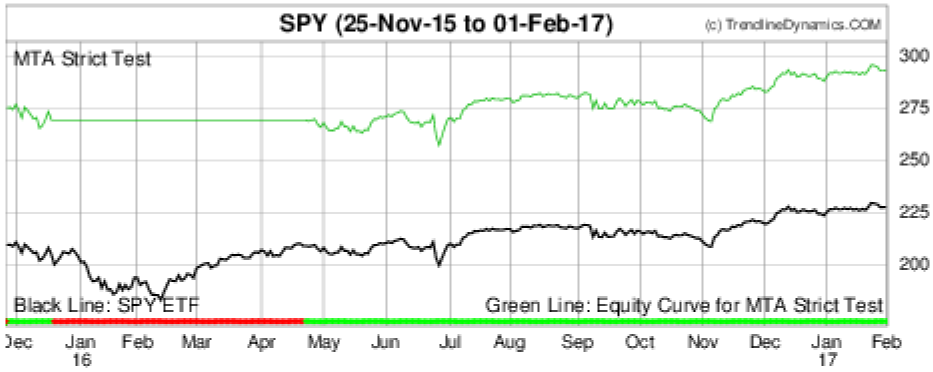


The Simple test continues to march to the beat of its own drummer. If you compare the three charts on this page, you'll notice that the Simple Test is the only one of the three to make money during 2015.

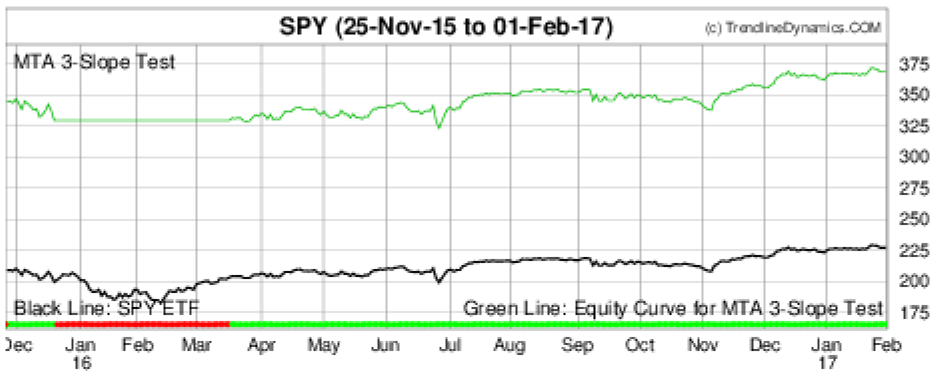


2016 Charts

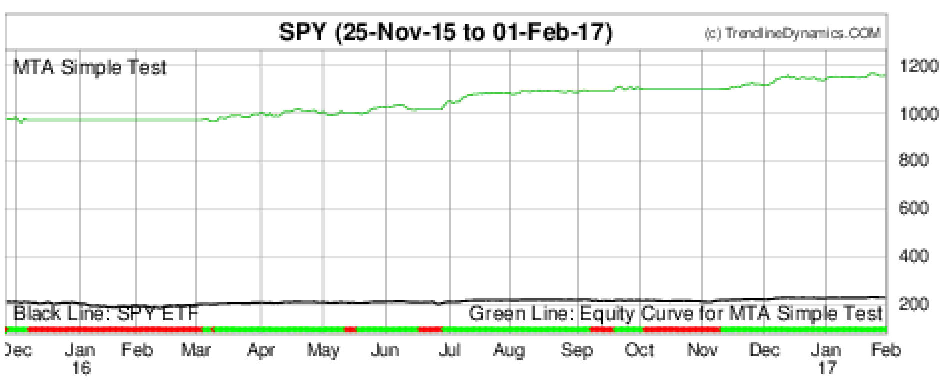
As the market pulls out of the 2015-2016 decline, the Strict Test goes long in late April.



The 3-Slope Test goes long in mid-March.

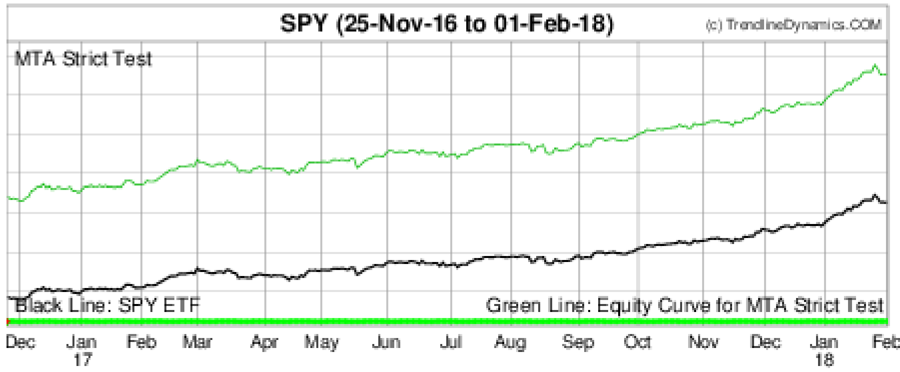


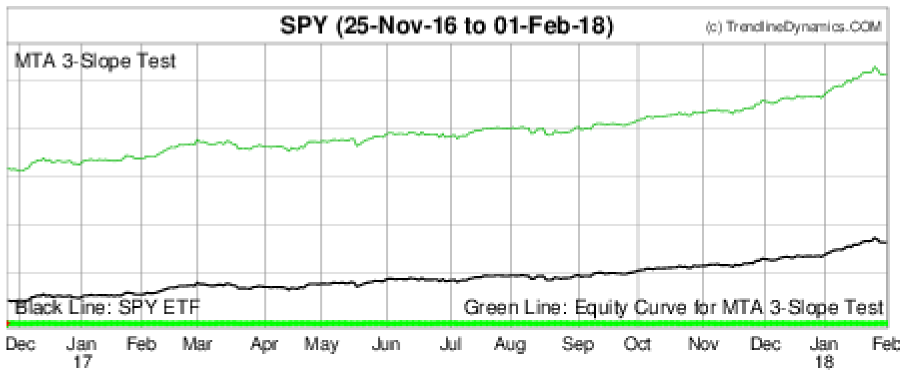
The Simple Test gets back into SPY in early March, then avoids a number of small declines during the rest of the year.



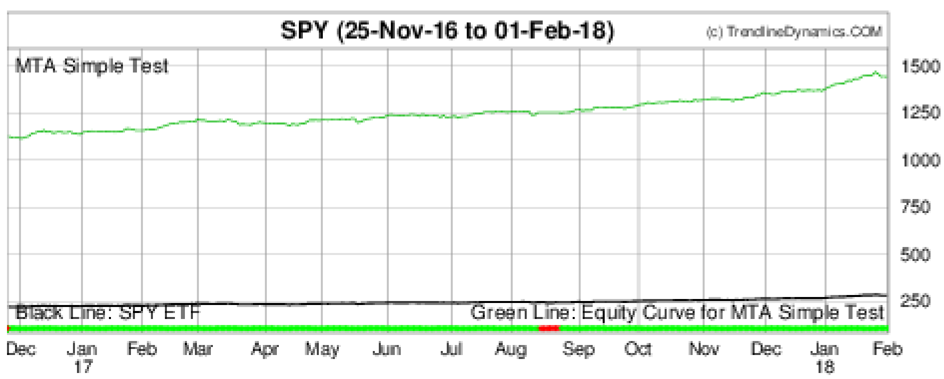
2017 Charts

In 2017 SPY goes into a strong up-trend, and all three tests stay in the market the entire year.



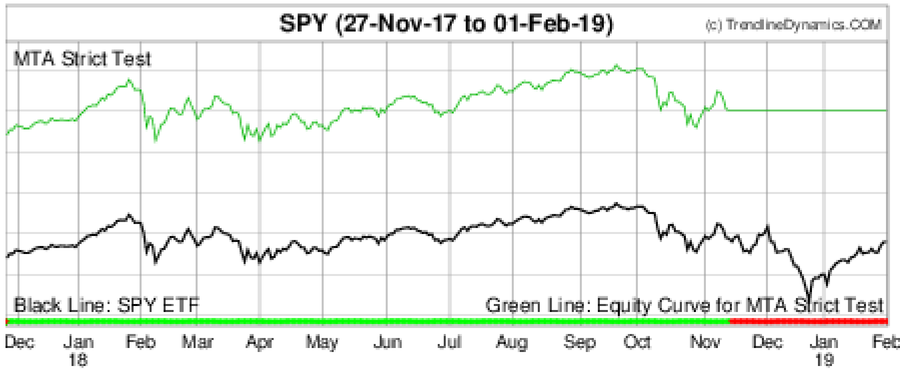


Except for an 8-day period where the Simple Test jumps out and then back in.

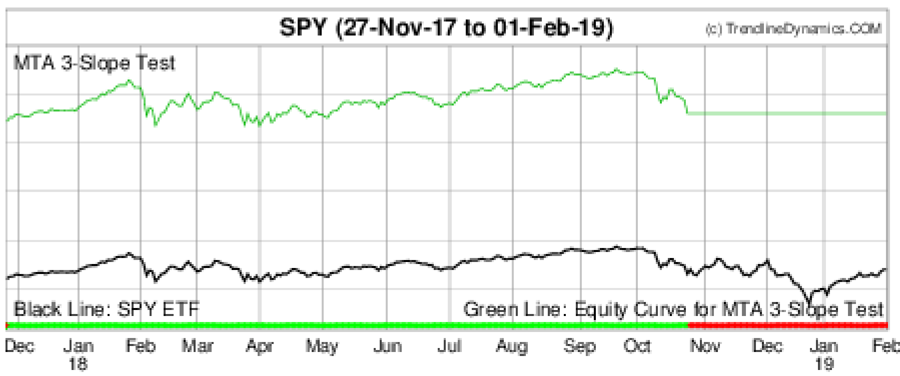


2018 Charts

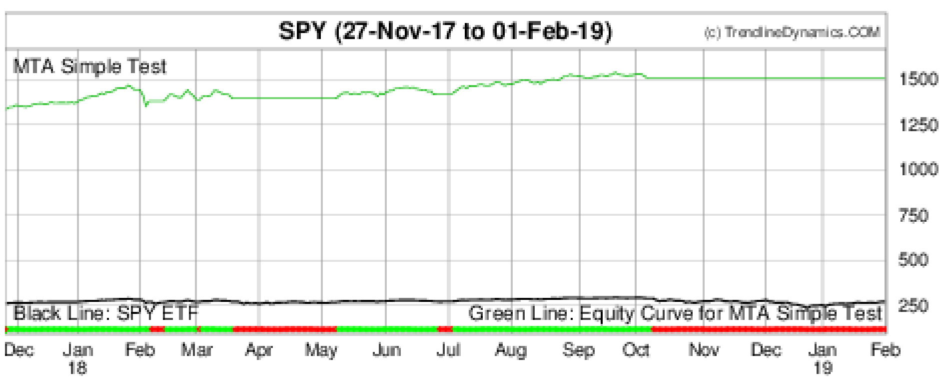
SPY peaks at an all-time high of $293.58 on September 20th. Then the wheels come off as the market rapidly declines to 234.34 on December 24th. The Strict Test gets out in mid-November at $272.06.



The 3-Slope Test gets out on October 24th at $265.32.

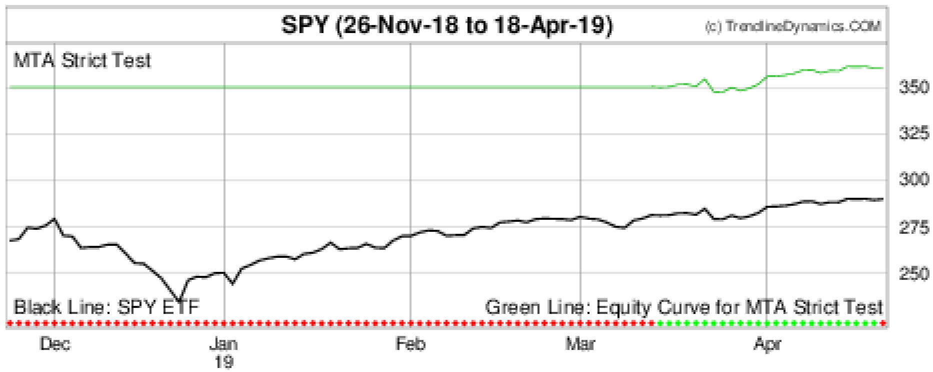


And the Simple Test exits at $287.82 on October 8th.

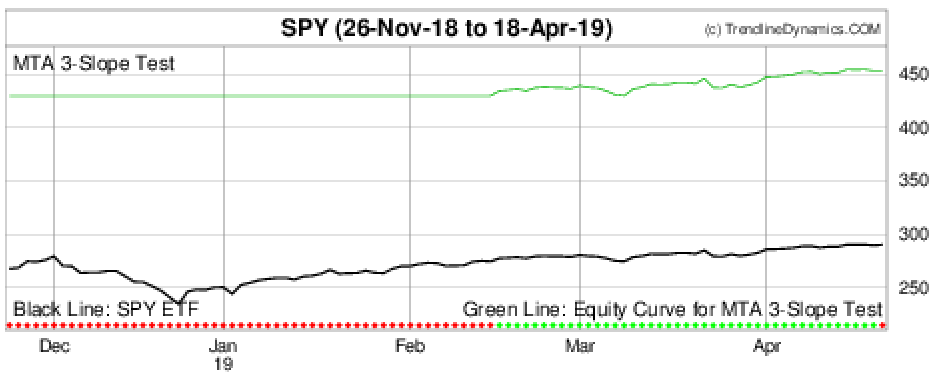


2019 Charts

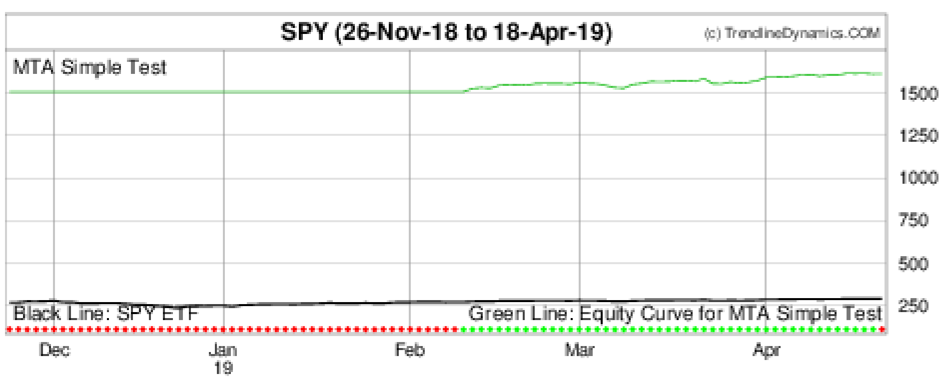
After the bone-jarring drop in the last three months of 2018, many people (including myself) assumed the bull market was finished and were very hesitant about getting back into the market. The Strict Test bought back into SPY in early March. As of April 18th, the Strict Test equity curve stood at $360.44, 24.25% above SPY which was at $290.02.



The 3-Slope Test bought back in near the middle of February. The 3-Slope equity curve was at $453.36, 56% higher than SPY.



The Simple Test got in a week before the 3-Slope Test. At the close of 18-Apr-2019 its equity curve had risen to $1613.29, 5.56 times higher (456%) than SPY.



CAVEATS

The results shown are hypothetical. Whether they will continue in the future depends on the operation of the financial markets continuing in essentially the same way as they have in the past. While this is likely in principle, one should keep in mind that the markets are always evolving.

The results shown depend on perfect execution: no missed signals, no data delays, no kibitzing, no hesitation. Further, the results do not include the costs of commissions or slippage.

The primary value of the results shown here is to demonstrate the relative performance of the three MTA tests. These results should not be used to assume future returns.

Finally, these charts only show one security, SPY. Results with other securities will undoubtedly vary, and they may vary dramatically. I will be running the three MTA Tests against other securities in the future. I surmise the best results will come from heavily-traded ETFs like QQQ, IWM, VTI, and XLF, or relatively sedate ETF's like USMV and TLT. However, this is just speculation and no testing has been done yet.

Conclusions

Investing with the Simple Test offers to increase your return 5.5 times more than buying and holding SPY. While the thought is tantalizing, it is not practical for most investors. In order to implement trading with the Simple Test, you would have to check the indicator every market day without fail. With a average holding period of 35 days, being one day late to enter or exit could might turn a winning trade into a losing trade. Since the results are compounded, losses (or even reduced returns) on 2 or 3 of the 86 total trades could seriously reduce your final outcome.

Considering these factors, I don't believe that trading with the Simple Test is actually practical for any one person, regardless of their dedication to following the system. In order to implement trading with the Simple test, it would require a team of three traders. With a team of three, two could always be watching the market and communicating with each other. That would leave time for one of the three to miss a day for personal reasons, recover from an illness, or go on a vacation.

The 3-Slope Test has an average holding period of 207 days, which is much more forgiving. If you are a day or even two days late taking action, it's not a calamity. If you occasionally miss a day, it's probably not going to hurt you too much. Also, when displayed with the status of all three averages, the 3-Slope Test gives you warning when the market may be starting to turn. You know when you need pay more careful attention to the market and when a quick glance at the chart is enough. As such, I think the 3-Slope Test is much more practical for the individual investor.