ETF Rotation Systems to beat the Market

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ETF Rotation Systems to beat the Market - American Equities

Because I'm usually hungry for trading and investing related content, it's unavoidable for me to spend two or three solid hours during the weekends on the web looking to learn something new. Most times, I find way too many things that lack real value or that do not offer real actionable ideas. Long gone are the days when I used to waste my life reading random gurus' opinions and forecasts. There is tons of information on the markets out there. A very small portion of it, is truly worth something. However, from time to time you find that little gem and you're allowed to experience that Eureka moment once again.

One trading technique that has really picked my interest in the last couple of months is ETF Rotation systems. I already knew about them but I had kind of put the subject aside without paying much attention until now.

The basic goal

The idea is to basically try to beat the markets by being invested in specific sectors that have some "recent" momentum going in their favor, discarding others that are performing poorly. By doing this, ETF Rotation Systems aim to deliver better returns than the market and with less volatility (smoother equity curve + smaller and shorter draw-downs).

Rotation vs being long SPY

We all know that most retail traders lose money in the long run. We also know that every year, 75% to 90%+ of the professional money managers fail to beat the S&P500 index. It's because of that, that being an index follower makes sense if you have a very long term horizon in mind. Simply buying shares of SPY, collecting the quarterly dividends and riding it year in and year out will guarantee that you will beat most traders, including professionals. You will spend way less money in management fees and trading commissions and hopefully, given enough time, you will be able to grow your capital at a compound annual growth rate of around 7%.

However, being simply long the market via an index following approach is a bumpy road and you are destined to suffer gut wrenching draw-downs that may take years to recover. At the same time, being long an index is not suitable for everybody. For example a period like 1929-1932 where the market lost 89% of its value would have been devastating right in front of your retirement. Or more recently, a 55% draw-down on the SPX between 2008 and 2009 which was indeed life changing for many and not in a good way. Yes, you would have gotten out of the draw-down years later had you remained invested, but you would have had to delay your retirement because of the market crash. 4 or 5 more years working for "the man" just because of the freaking market crash. Not funny.

So, instead of simply being long say SPY, an ETF Rotation system would attempt to only be long a portion of the SPY. That is, a particular sector inside the index, discarding the rest of the stocks that are doing bad. A current example as of this writing would be long the market except for the energy sector, which has been taking it on the chin lately. Every month, the system calculates the recent performance of its instruments of choice and puts the capital to work on the best of them, discarding the rest until next month when everything is re-evaluated. If the best symbols this month are the same symbols the portfolio is already invested in, then no trades, simply enjoy the party until next month.

The rotation system of your choice doesn't have to be constrained to equities. In fact it is healthy to mix up different asset classes like US Stocks, International Stocks, Commodities, Real Estate, Bonds, etc.

Will an ETF Rotation system always beat the market?

Of course not. With ETF Rotation systems you are always chasing recent performance. You may end up moving into an ETF that has performed well in the last three months, only to see it decay going forward. That's why your evaluation function is crucial as well as back-testing your ideas. However, depending on the instruments of choice and your tests you will find that most of the time it is way better to invest in recently strong ETFs, than to try and catch falling knifes on the worst performing ones.

Your ETF Rotation system may not beat the market every single year, but as long as it beats the market by a good margin over the long run, with fewer heart attacks, it is worth it.

The ETF Rotation Systems to beat the Market series

After this lengthy introduction it is time to say Welcome to the **ETF Rotation Systems to beat the Market** series: the series of articles where I explore and back-test different rotation systems designed with the goal of beating the markets while minimizing draw-downs and volatility in the portfolio.

American Equities Rotation

For the first portfolio of the series I'm going to simply focus on a single asset class: Equities. This is a simple portfolio that chooses the best three sectors every month from the pool below:

XLB: U.S. Materials Sector SPDR
XLE: U.S. Energy Sector SPDR
XLF: U.S. Financial Sector SPDR
XLI: U.S. Industrials Sector SPDR
XLK: U.S. Technology Sector SPDR
XLP: U.S. Consumer Staples Sector SPDR
XLU: U.S. Utilities Sector SPDR
XLV: U.S. Health Care Sector SPDR
XLY: U.S. Consumer Discretionary Sector SPDR

How are the three best ETFs selected every month?

There are three ingredients involved in the formula:

- The 3 months return (40% weight in the final score)
- The 20 day return (30% weight in the final score)
- The 20 days volatility (30% weight in the final score). Volatility is the annualized standard deviation of daily returns. So, the 20-day Volatility is the standard deviation of the past 20 1-day returns multiplied by SQRT(252)

(annualized). The idea is to penalize the instruments that are having large variations in their daily returns. Those that are quiet and consistent are favored.

Here is the result from 2003 to 2014:

Definitely better than the S&P500 and less volatile:
CAGR: 11.4% vs 9.5% SPY (better yearly returns)
Volatility: 16.6% vs 19.5% SPY (less volatile)
Worst draw-down: -43.3% vs -55.2% SPY (smaller draw-down)

Not bad, but with lots of room for improvement.

Let's apply a filter rule in order to minimize draw-downs: If a selected ETF is below its 10-month moving average, then the third of the portfolio that would correspond to it will be invested in SHY instead (1-3 year Treasury bonds fund). If two of the three best ETFs are trading below their 10-month average, then 2 thirds of the portfolio would go to SHY. If all three of the best ETFs are below their 10-month moving average, the entire portfolio goes to SHY. This is in order to avoid major draw-downs, as it is obvious that if the three best sectors are below such a long term moving average, then what can we expect from the rest? Something pretty bad must be happening out there, better to move the capital to a safe instrument.

Here are the results:

CAGR: 10.4% vs 9.5% SPY (better yearly returns)
Volatility: 13.2% vs 19.5% SPY (way less volatile)
Worst draw-down: -25% vs -55.2% SPY (much smaller draw-down)

The 2008 collapse would have only been a 25% draw-down for this portfolio. However, by moving the capital to a safe instrument (SHY) from time to time we inevitably had to sacrifice some of the performance, as the yearly return went from +11.4% in the first case to +10.4% when the filter rule was applied.

This is a simple ETF Rotation system entirely based on equities. Not spectacular by any means but apparently effective and better than simply long SPY (which the vast majority under-perform anyways). In the upcoming chapters I will share some portfolios with very interesting results, some of them truly remarkable. Stay tuned.

ETF Rotation Systems to beat the Market - Global Equities

On the previous chapter we saw a simple ETF Rotation System purely based on American Equities. We saw how it out performed the SPY while being less volatile which are the two main goals of ETF Rotation systems.

However, given the nature of the markets and the constant uncertainty about the future, being invested on a single country for long periods of time poses significant risks. While we know that the US Markets have grown about 7% a year on average for the last century, there is absolutely no guarantee that this will continue to be the case going forward. The risk of being invested in equities of a single geographic area can be clearly exemplified with the case of Japan.

The Nikkei 225 Index made an all-time high of 38,957.44 on December 29, 1989. Today, more than 25 years later, the index is trading at 17,197.73. Yikes!

Had you been invested on Japanese equities these last 25 years you wouldn't have done much to help your retirement cause. In fact you could have quite possibly hurt yourself pretty badly.

Will the same thing ever happen to the US Markets? Probably not. But can anyone guarantee it? Absolutely NOT. Because nobody knows anything. Japan was the second most powerful economy in the universe, a very important nation with over 100 million people, a country full of pretty smart individuals,...yet this is what happened to their markets. If you invest on an ETF Rotation System based purely on American equities and something similar happens to the American Markets, it doesn't matter how much you rotate or what the hell you do with your 100% equity portfolio: You will have negative returns.

But one thing that tends to happen in this life, is that almost always, when somebody is doing badly, there are others taking advantage of that and doing much better. For example, when the price of Oil is high, the economies of net Oil importers suffer, however countries like Canada and Russia flourish. Vice versa when Oil goes to cheap extremes. When a country has a hugely negative trade balance with another nation, one of them is screwed, but the other one is usually doing better, and so on. It is more likely for one country to be doing badly than it is for the entire planet to be doing badly at the same time. There are extreme cases such as the 2008 financial crisis, but even then there were countries that comparatively did much better. For example Canada didn't need to bail out its banks and didn't even suffer a housing crash back then. We can mention several examples related to other commodities and other countries or entire geographic regions, but you get the idea.

For this reason if you are going to use a 100% equity based portfolio, a Global Equities ETFs Rotation system is stronger and has better chances of long term survival than the American Equities ETFs Rotation system seen on the previous chapter. With that in mind, we'll simulate a Global Equities portfolio that rotates its capital among the following 5 ETFs:

EEM: iShares MSCI Emerging Markets Indx (ETF)
EPP: iShares MSCI Pacific ex-Japan Idx (ETF)
IEV: iShares S&P Europe 350 Index (ETF)
ILF: iShares S&P Latin America 40 Index (ETF)
MDY: SPDR S&P MidCap 400 ETF

Every month, the system ranks these 5 ETFs and moves the capital to the 2 best performers. The mechanism to rank the ETFs was discussed in the Introduction of the series.

50% of the portfolio goes to the best performer, 50% of the portfolio goes to the second best performer. If the best ETFs are the same of last month, no new trades are made and the portfolio remains invested in them, enjoying the ride.

If one of the selected best performers is trading below its 10 month moving average, its portion of the portfolio goes to cash or alternatively very short term treasury bonds via SHY. If both are trading below their 10 month Moving Average the entire portfolio goes to SHY. This is to avoid turbulent periods in the global economy.

Here are the results from 2003 to 2014:

Definitely better than the S&P500 and less volatile:
CAGR: 17.2% vs 9.5% SPY (better yearly returns)
Volatility: 17.6% vs 19.5% SPY (less volatile)
Worst draw-down: -22.2% vs -55.2% SPY (smaller draw-down)
Sharpe ratio: 0.85 vs 0.44 SPY (Superior risk-adjusted performance)

Not too shabby! The Global ETFs Rotation system has delivered a Compound Annual Growth Rate of +17.2%. Its maximum draw-down was -22.2%, way lower than the -55.2% posted by SPY. In 2008, when the world was falling apart, this system delivered a -0.4% return while the SPY posted -36.8%.

Obviously it is not a perfect system, and still too volatile an equity curve for many, myself included. We will start to explore other systems, more diversified with asset classes other than equities. We will see interesting portfolios with similar returns and much smoother equity curves.

ETF Rotation Systems to beat the Market - American Equities + TLT + GLD + IYR + EEM

So far, we've only discussed systems whose instruments belong to one single asset category: Equities. The Global Equities rotation system delivered a solid +17.2% Compound Annual Growth Rate for over a decade. But it was still pretty volatile (17.6% volatility) and its worst draw-down at -22.2% would have had many investors screaming for the exit. That's what happens with equities: the asset class that over time delivers the best returns is also the most volatile one. Although the yearly return of the portfolio was solid, we need to address the volatility on that equity curve and also that worst draw-down value. We'll address that by exploring the benefits of diversifying the portfolio with other components such as Bonds, Real Estate and Precious Metals.

To illustrate the benefits of using different asset classes, I'm going to use the exact American Equities portfolio discussed on the first chapter but I will add TLT (Bonds), GLD (Gold), IYR (Real Estate) and EEM (Emerging Markets) to it. This is the entire selection of instruments:

XLB: U.S. Materials Sector SPDR
XLE: U.S. Energy Sector SPDR
XLF: U.S. Financial Sector SPDR
XLI: U.S. Industrials Sector SPDR
XLK: U.S. Technology Sector SPDR
XLP: U.S. Consumer Staples Sector SPDR
XLU: U.S. Utilities Sector SPDR
XLV: U.S. Health Care Sector SPDR
XLY: U.S. Consumer Discretionary Sector SPDR
TLT: iShares Barclays 20+ Yr Treas.Bond (ETF)
GLD: SPDR Gold Shares
IYR: iShares Dow Jones Real Estate REIT
EEM: iShares MSCI Emerging Markets

I added International equities via EEM so as to diversify the equity exposure to markets outside the US. We saw the benefits of that in the previous chapter. Every month, the system ranks these 13 ETFs and moves the capital to the best 3 performers.

For the first simulation, the system will always be invested. By that I mean, no cash position. Every month, one third of the capital is invested in one of the three best performers, so the portfolio remains 100% invested at all times. Here's the result from 2003 to 2014:

Ok now we're talking!

CAGR: +15.6% vs +9.5% SPY (better yearly returns)
Volatility: 14.2% vs 19.5% SPY (less volatile)
Worst draw-down: -18.2% vs -55.2% SPY (smaller draw-down)
Sharpe ratio: 0.92 vs 0.44 SPY (Superior risk-adjusted performance)

The improvements over the simple American Equities Rotation system are huge with the addition of Bonds, Gold, Real Estate and Emerging Markets. No doubt those were healthy additions. This new system in my eyes is also better than the Global Equities rotation system discussed in the previous chapter. The equity curve is way easier to ride. The volatility of the system is 14.2% vs 17.6% of the Global Equities rotation system. The worst draw-down at -18.2% is still not ideal but better than the -22.2% of the Global Equities portfolio. The Sharpe ratio is also the best we've seen in the series so far with a solid 0.92.

These are the returns of the portfolio broken down per year:

Annual Performance

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Backtest	+21.5%	+3.4%	+11.8%	+17.2%	+15.4%	+3.3%	+18.9%	+22.2%	+23.6%
SPY	+28.2%	+10.7%	+4.8%	+15.8%	+5.1%	-36.8%	+26.4%	+15.1%	+1.9%
+ / -	-6.6%	-7.3%	+7.0%	+1.4%	+10.3%	+40.1%	-7.5%	+7.1%	+21.7%

2012	2013	2014
+13.8%	+21.7%	+16.2%
+16.0%	+32.3%	+13.5%
-2.2%	-10.6%	+2.8%

This portfolio didn't have a single negative year in the entire back test, not even 2008 where it was invested in Gold and Bonds almost all the time.

Let's now apply our filter rule. If any selected instrument (among the best 3 for the month) is below its 10 month moving average, that third of the portfolio goes to cash or a proxy like SHY (very short term bonds). The goal is to avoid times of turbulence by going to a conservative instrument.

This is certainly an interesting result:

CAGR: +14.2% vs +9.5% SPY (better yearly returns)
Volatility: 13.1% vs 19.5% SPY (less volatile)
Worst draw-down: -13.0% vs -55.2% SPY (smaller draw-down)
Sharpe ratio: 0.90 vs 0.44 SPY (Superior risk-adjusted performance)

Comparison of the portfolio with and without the filter rule:

	Portfolio without filter	Portfolio with filter rule
CAGR	15.60%	14.20%
Volatility	14.20%	13.10%
Worst draw-down	-18.20%	-13.00%
Sharpe ratio	0.92	0.90

As expected, the version with the filter rule was less volatile. Obviously at the expense of some reduction in the annual returns. The reduction in the worst draw-down statistic was significant and a 13% draw-down is something that many investors can digest. With a greater than 1 ratio of **CAGR/Max Draw-Down** this is a remarkable result. The filter rule didn't do much to improve the risk-adjusted performance a.k.a Sharpe Ratio.

Which version of the system is better is up for debate. The 1.40% performance difference of the first version becomes significant when compounded over time. That is, if you can sleep well with a portfolio that is a little bit more aggressive and volatile. The smaller worst draw-down of the second version is certainly very attractive

on the other hand while still averaging returns far superior than the market. I guess this decision is up to the investor based on his own personality and risk tolerance.

This is the third ETF Rotation system of the series. Two more to go.

ETF Rotation Systems to beat the Market - SPY + EFA + IEF + GLD + ICF

In the previous chapter we started to diversify the portfolio by adding other asset classes into the mix. The **American Equities + TLT + GLD + IYR + EEM portfolio** delivered some very interesting results in terms of both performance and draw-downs for 12 years of back test. With such encouraging results, we inevitable start to wonder, how far can this go?

How much better can things possibly get from here? After all, profitability can only be stretched so much before we add excessive risk or start curve-fitting the system to past known data.

I'm mentioning this because I have seen a number of ETF Rotation systems discussed in different places, with supposedly 30%, 40% even 60% yearly returns. To me that's all absurd. Most of them are curve-fitted systems with an excessive number of rules and a good portion of them if not most, are made up of young ETFs with no more than 3 - 5 years of history. Of course a 3 - 5 year back test can show you a 40% Average Yearly return on an ETF Rotation system. But that's almost unequivocally an anomaly that should correct itself over time. Even the system discussed in the previous chapter had a 21% yearly return from 2009 to 2011. But that's only part of the history. 3 years should create no illusion at all in the minds of savvy investors.

By now I have experimented with a bunch of combinations of instruments and probably ran close to a thousand back tests or more. I was only able to create one portfolio with a greater than 20% yearly return for the entire 12 year period, which is as far back as ETFReplay.com goes. And that portfolio was pretty aggressive and had to endure a -25% draw-down to achieve those results. I won't discuss it in the series as I don't think it is that interesting.

Now you know you won't find the holy grail in this series of articles. But that won't stop me from trying to refine the systems and improve statistics such as the volatility of the portfolio, the worst draw-down and the risk-adjusted performance (Sharpe Ratio). For more information on the Sharpe Ratio visit this link.

Today we are going to simulate a portfolio with only 5 instruments but a solid degree of diversification. This portfolio is good for small accounts as the number of trades per year is smaller than the 13 instrument portfolio analyzed in the previous chapter. This reduces the impact of commissions as you have to get in and out of positions less frequently. The portfolio only selects the two best performers every month (instead of 3) which makes it even less active.

These are the instruments of choice:

SPY: SPDR S&P500 Index (US Equity)
EFA: iShares MSCI EAFE (International Equity)
ICF: iShares Cohen&Steers Realty REIT (Real Estate)
IEF: iShares Barclays 7-10 Yr Treasury (Medium term Bonds)
GLD: SPDR Gold Trust

Here's the result from 2003 to 2014

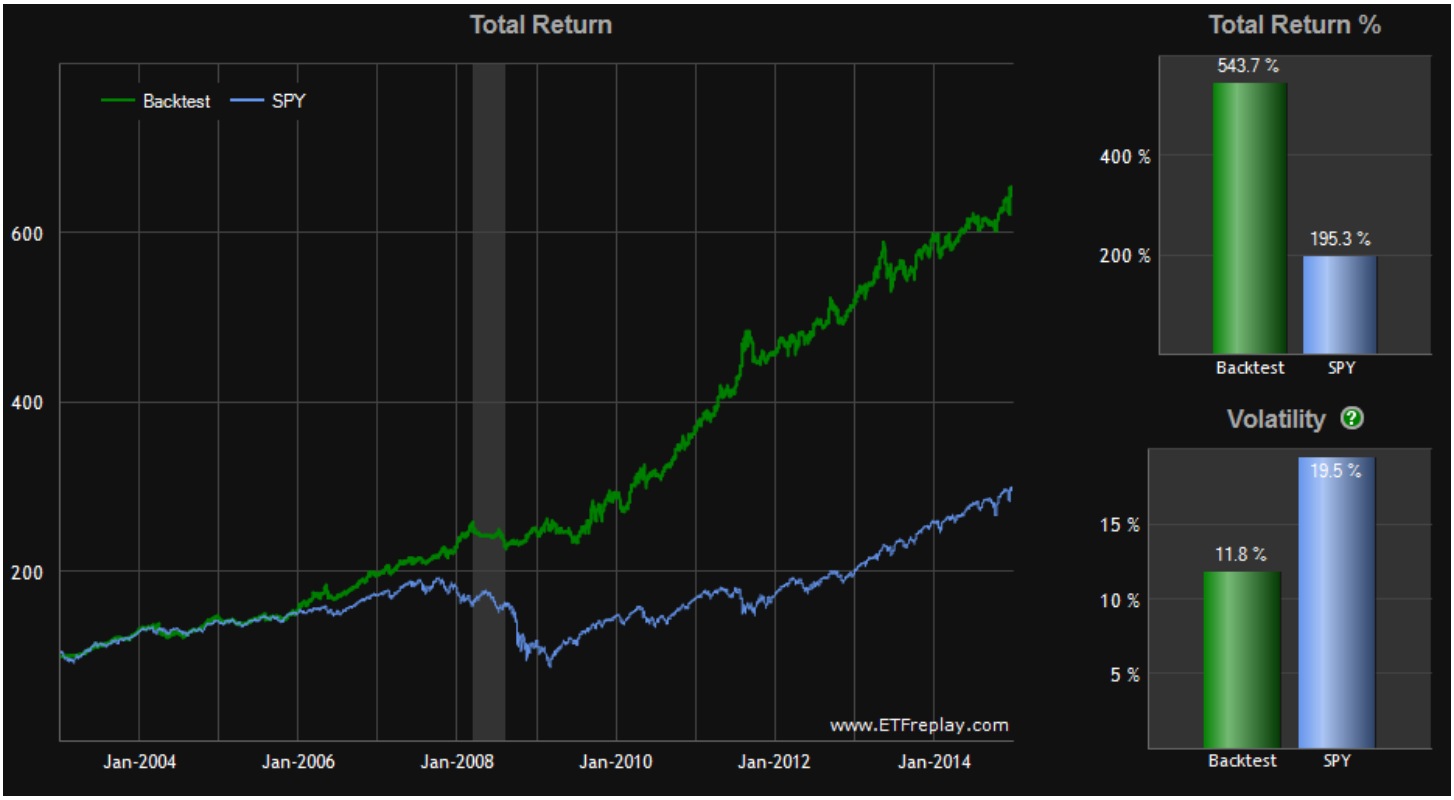
CAGR: 18.3% vs 9.5% SPY
Volatility: 12.9% vs 19.5% SPY
Worst draw-down: -22.2% vs -55.2% SPY
Sharpe ratio: 1.18 vs 0.44 SPY

This is the first portfolio in the series with a Sharpe Ratio above one, which is excellent. Great yearly return at 18.3%. Even though the worst draw-down was a bit high at -22.2% the equity curve was very stable showing a volatility of just 12.9% in the 12 year period.

Here are the returns per year:

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Backtest	+29.8%	+13.8%	+4.3%	+30.1%	+16.4%	+4.0%	+25.6%	+28.3%	+32.3%
SPY	+28.2%	+10.7%	+4.8%	+15.8%	+5.1%	-36.8%	+26.4%	+15.1%	+1.9%
+ / -	+1.6%	+3.1%	-0.6%	+14.3%	+11.3%	+40.8%	-0.8%	+13.2%	+30.4%
	2012	2013	2014						
	+14.8%	+17.2%	+7.4%						
	+16.0%	+32.3%	+13.5%						
	-1.2%	-15.1%	-6.0%						

This portfolio looks solid just as is. But just out of curiosity let's apply the filter rule. Again, if a chosen instrument is below its 10 month moving average, its corresponding 50% of the portfolio goes to cash or SHY. If both chosen instruments are below the 10 month average the entire portfolio goes to cash.



CAGR: 16.8% vs 9.5% SPY
Volatility: 11.8% vs 19.5% SPY
Worst draw-down: -12.6% vs -55.2% SPY
Sharpe ratio: 1.19 vs 0.44 SPY

These are serious numbers. A 16.8% yearly return with a worst-draw-down of only 12.6% and an equity curve with an 11.8% volatility is as good as it gets.

Here are the returns per year:

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Backtest	+29.7%	+14.1%	+3.1%	+29.5%	+15.7%	+9.6%	+14.3%	+28.3%	+24.8%
SPY	+28.2%	+10.7%	+4.8%	+15.8%	+5.1%	-36.8%	+26.4%	+15.1%	+1.9%
+ / -	+1.5%	+3.4%	-1.7%	+13.6%	+10.5%	+46.4%	-12.0%	+13.2%	+22.9%

2012	2013	2014
+12.3%	+16.4%	+7.4%
+16.0%	+32.3%	+13.5%
-3.7%	-15.9%	-6.0%

Both versions of the portfolio (with and without the filter rule) have underperformed SPY in the last 3 years. This is due to the fact that SPY has been really strong in that period, but that will change in the future. There's no way the S&P500 will keep delivering double digit returns forever.

On a side note, some people have asked me why not select only the best instrument. Others have asked me why not the best 4 or 5 in the case of a large selection of instruments.

The answer to the first question is simple, having the entire portfolio invested in only one instrument makes it way more volatile as the back tests I have run clearly show over and over again. On the other hand, choosing

too many vehicles leads to a situation where you invest in some that are not stellar, but just "good" which tends to cause a decrease in the returns. For example, in the portfolio analyzed today, choosing only the best instrument each months leads to greater volatility and choosing the best 3 instruments out of 5 inevitably leads to smaller returns.

Thanks for reading and stay tuned for the last portfolio to close off the series.

ETF Rotation Systems to beat the Market - SPY + IWM + EEM + EFA + TLT + TLH + DBC + GLD + ICF + RWX

We are now going to take the concept of diversification a little farther. We will exploit the idea of the fourth chapter materialized in the SPY + EFA + IEF + GLD + ICF portfolio. That is, we will create a portfolio that uses the same asset classes: Equity (US), Equity (International), Bonds, Real Estate and Commodities but this time we will choose two symbols for each category instead of just one.

These are the ETFs of choice:
US Equity:
SPY - SPDR S&P 500 ETF Trust
IWM - iShares Russell 2000 Index (ETF)

International Equity:
EFA - iShares MSCI EAFE Index Fund
EEM - iShares MSCI Emerging Markets Index

Bonds:
TLT - iShares Barclays 20+ Yr Treasury Bond
TLH - iShares Lehman 10-20 Yr Treasury Bond

Commodities:
DBC - PowerShares DB Com Index Tracking Fund
GLD - SPDR Gold Trust

Real Estate:
ICF - iShares Cohen & Steers Realty Maj.
RWX- SPDR Dow Jones International Real Estate

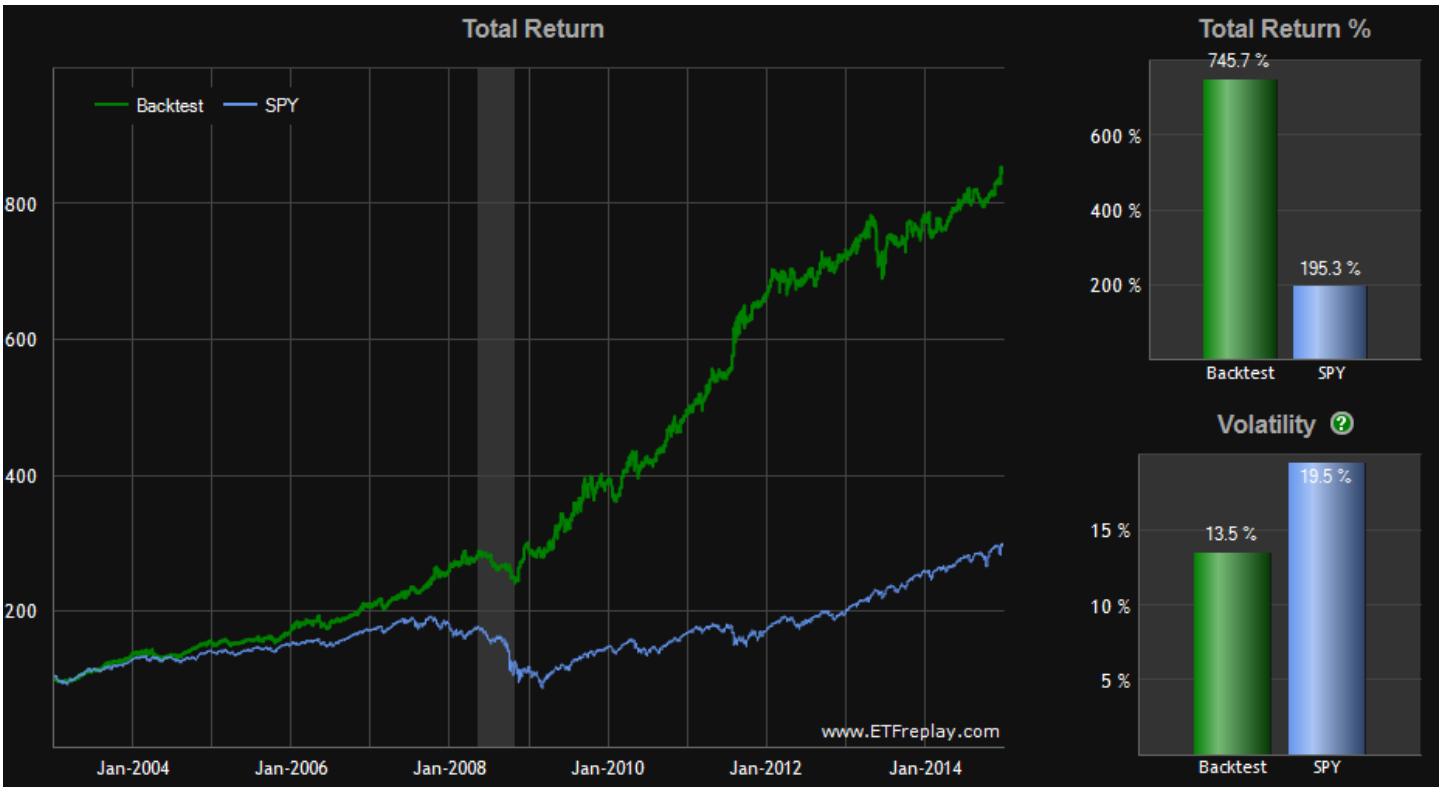
Let's analyze the system when it invests in the two best performers each month. 50% of the capital goes to each one of the two best ETFs. The formula to evaluate the ETFs was discussed in the Introduction of the series. The system is always 100% invested. No cash position.

Here are the results:

CAGR: 18.8% vs 9.5% SPY
Volatility: 15.3% vs 19.5% SPY
Worst draw-down: -13.8% vs -55.2% SPY
Sharpe ratio: 1.06 vs 0.44 SPY

This is a great result. 18.8% Compound Annual Growth Rate for a 12 year back-test period is nothing to sniff at. Let alone with a maximum draw-down of only 13.8%.

Now, let's do another test but instead of investing in the 2 best ETFs each month, the system will invest in the best 3 ETFs each month. 33% of the capital will go to each one of the selected ETFs. Again the portfolio remains 100% invested at all times. No cash position. In a pool of 10 instruments to select from, choosing 3 shouldn't cause a huge loss of performance as the third best ETFs should still be a pretty good one. I would also expect less volatility, more stability in the equity curve over time. Let's see:



CAGR: 19.5% vs 9.5% SPY
Volatility: 13.5% vs 19.5% SPY
Worst draw-down: -16.5% vs -55.2% SPY
Sharpe ratio: 1.22 vs 0.44 SPY

Nice improvement in terms of Compound Annual Growth Rate. The volatility of the portfolio also decreased but the worst draw-down was a bit higher. Still, great ETF Rotation System with an outstanding Sharpe Ratio of 1.22. I feel pretty happy with this portfolio and would trade it with my own money (if only I had more).

Surprisingly adding a cash filter rule to this system doesn't provide improvements. The filter rule, as a reminder, is the rule by which, if one of the selected instruments to be invested in is trading below its 10 month moving average, that portion of the capital sits in cash or very short term bonds (SHY). No improvements were obtained. The addition of the filter rule always decreases the returns a little bit and the goal is to see a significant reduction in the worst draw-down and the volatility of the portfolio. While it did decrease the returns, the rule didn't provide a reduction in the volatility nor the worst draw-down numbers to justify its addition.

My final take on ETF Rotation Systems and some things to consider

ETF Rotation systems have been quiet a discovery for me. What really impresses me is the fact that your particular choice of ETFs is not as important for outperforming the markets as it is to diversify your selection using different asset classes. This says a lot about how powerful the strategy is. Positive long term results will not depend on your ability to magically pick the best instruments of the future, which is great. During my hundreds of tests, portfolios seemed to always easily beat the market as long as several asset classes were used. Any portfolio of ETFs that covered US Equity, International Equity, Bonds, Real Estate and Commodities outperformed the S&P500 regardless of the specific ETFs I chose. This reinforces my confidence in the strategy. The idea in principle is solid and the particular choice of ETFs is not as determinant for your long term success as long as you are diversified across multiple asset classes.

One thing to keep in mind when designing your portfolio is the management fees of your ETFs of choice. ETFs are usually cheaper than Mutual Funds by far, but still something to look at. Obviously the smaller the management fee the better. Also, look at possible dividends. If your ETFs of choice are dividend payers then that's better. By the way all the test results shown in the series include dividends.

If you have a small portfolio, make sure trading costs are reasonably controlled. For example if your ETF Rotation system chooses the 2 best ETFs each month, assume that you will make 4 transactions every month. Two in order to sell your current ETFs plus two in order to buy the best two ETFs for the next cycle. That is a total of 48 transactions per year. You may end up trading much less than that. You may find your system riding an ETF for an entire year without having to sell it to purchase another one, but when designing your system you must take into account the worst case scenario and the maximum possible number of trades per year. In this case, 4 trades per month means 48 per year. A broker charging only $5 per transaction would cost you $240. If you have a small $10,000 portfolio, that trading cost represents a 2.40% drag in the performance, which is unacceptable. Either find a broker with cheap commissions for trading ETFs or wait until you have a larger amount of money in order to implement an ETF Rotation system where your worst trading costs per year will be less than 1% of the portfolio balance.

ETFs rotation systems have great potential for outperforming a simply "long the market strategy" in the long run and to do it with less volatility and smaller draw-downs. There is plenty of evidence to support that statement.

This is the end of the **ETF Rotation Systems to beat the Market** series. I hope you had as much fun reading it as I had writing it and I hope it is useful to someone out there.

Thanks for reading!
LT

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