Putting The Put-Write Right

Just as surfers are supposed to dream of the perfect wave, traders are supposed to dream of the perfect arbitrage, those supposedly non-existent opportunities to buy and sell equivalent assets against one another and walk away with a riskless profit.

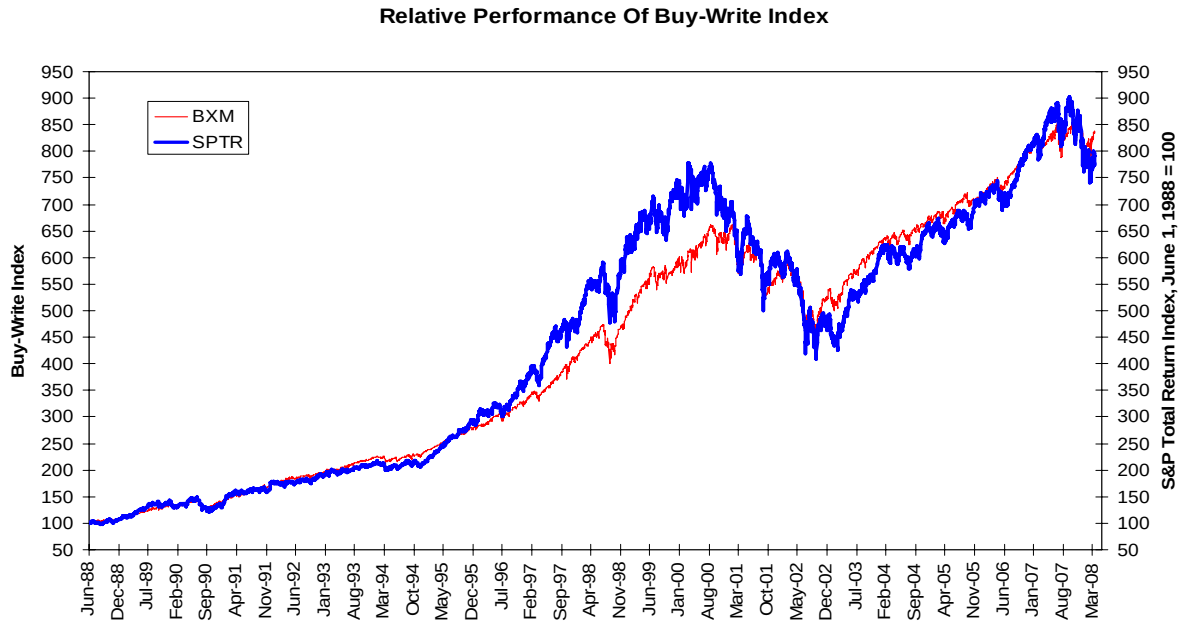
Option traders by their very nature are attuned toward any hint of pricing anomalies, real or apparent, and they understand synthetic positions backwards and forwards. This is what makes the story below interesting; two closely related strategies have widely divergent results for an intriguing reason.

The Buy-Write

Many retail traders and investors availed themselves for years in a strategy of writing covered call options on stocks and indices; indeed, "option income" mutual funds devoted to this strategy have been around since the 1980s, and covered-writes are one of the two strategies allowed in retirement accounts, long protective put options being the other. The premise was alluring, simple and wrong: As you already owned the asset, you should be willing to give away the upside. And as anyone who has ever been on the sell-side of the business can attest, customers are willing to listen to anything where the first step involves cashing a check.

The Chicago Board of Options Exchange institutionalized this strategy with their Buy-Write index (BXM) on the S&P 500. If we compare the BXM's hypothetical history back to June 1988 against the S&P 500 Total Return index (SPTR) re-indexed to that date, we have to wonder why anyone would bother. Prior to the effects of taxes, if any, and any recognition of the BXM's additional and no doubt higher transactions costs, the average daily returns of the BXM and SPTR were quite close, .0424% versus .0410%. Yes, the standard deviation of BXM returns was lower, but this is an apples-to-oranges comparison. The BXM has the truncated distribution of a synthetic short put option.

The end result after two decades is the BXM achieves nothing other than a significant underperformance during the bull market of the late 1990s offset by outperformance during the low-volatility rally of 2003-2005.



Enter The Put-Write

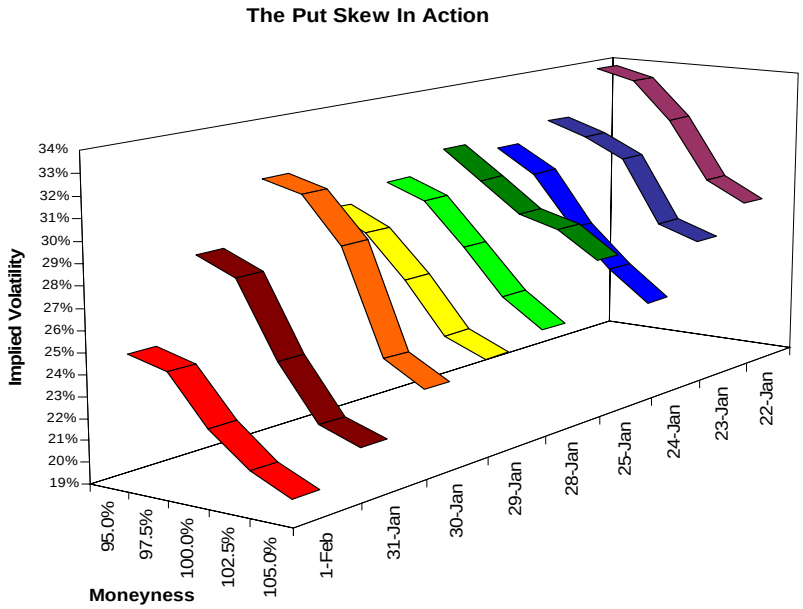
As mentioned above, the buy-write strategy is a synthetic short put option on the S&P 500 (the index itself is a long call plus a short put, so subtracting the call leaves you with the short put). Veteran traders recoil instinctively at the idea of writing put options on stock indices; this led to some spectacular losses in the market crashes of October 1987 and October 1989, and the education of at least one speculator in October 1997.

Imagine the surprise, then, when the CBOE announced their Put-Write index (PUT) in 2007, replete with another hypothetical history back to 1988. Was this just a duplication of the BXM?

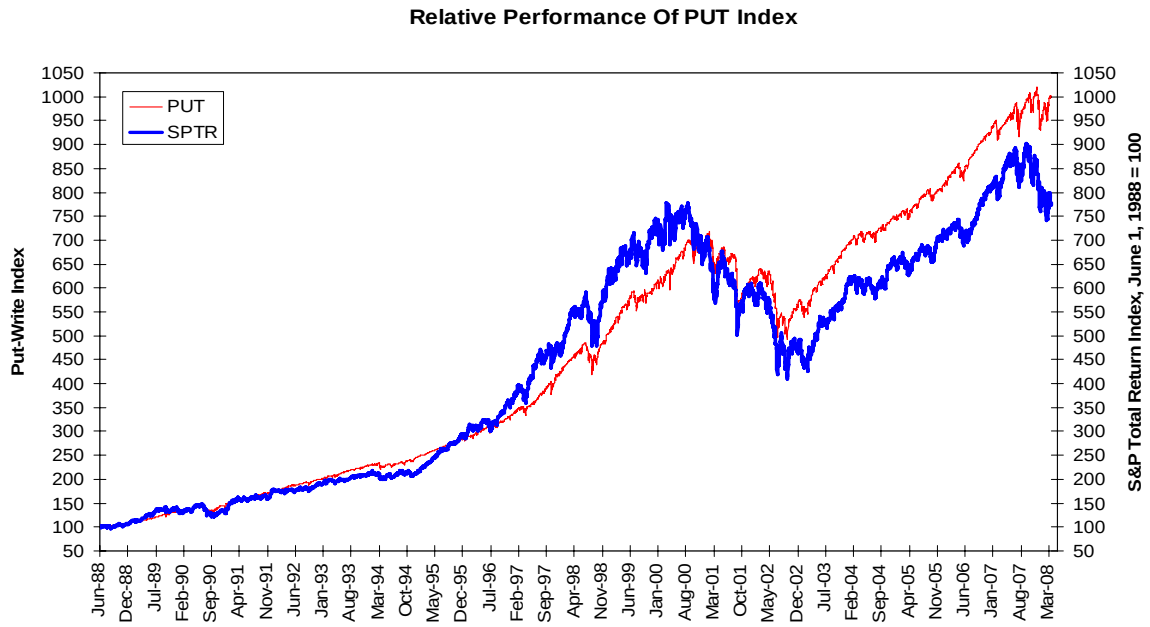
No, not quite. First, the PUT involved a fully collateralized position, meaning it would calculate how much money you could lose, adjust the quantity of put options written accordingly and then invest the remainder in a money market fund.

Second, and most critically, the BXM involves the writing of call options; the PUT involves the writing of put options. This brings the put skew of stock indices into play; as the index falls and volatility expands, the volatility of the put wing and especially out-of-the-money puts tends to rise much faster. This gives the PUT a significant advantage; it writes high-volatility put options while the BXM writes lower-volatility call options.

We can illustrate this quite simply over the late January period following *l'affaire Kerviel* and the Federal Reserve's decision to cut interest rates by 75 basis points on January 22 and again by 50 basis points on January 30. The S&P 500 rallied from 1310 to 1395 over this period, and volatility dropped as expected. But this drop was not uniform across strikes. If we map volatility levels by moneyness (in-the-money puts have moneyness greater than 100%), we see how the 95%-moneyness put volatility fell by 9.0 percentage points while the 105%-moneyness put volatility fell by only 7.6 percentage points. It does indeed what kind of option you write.



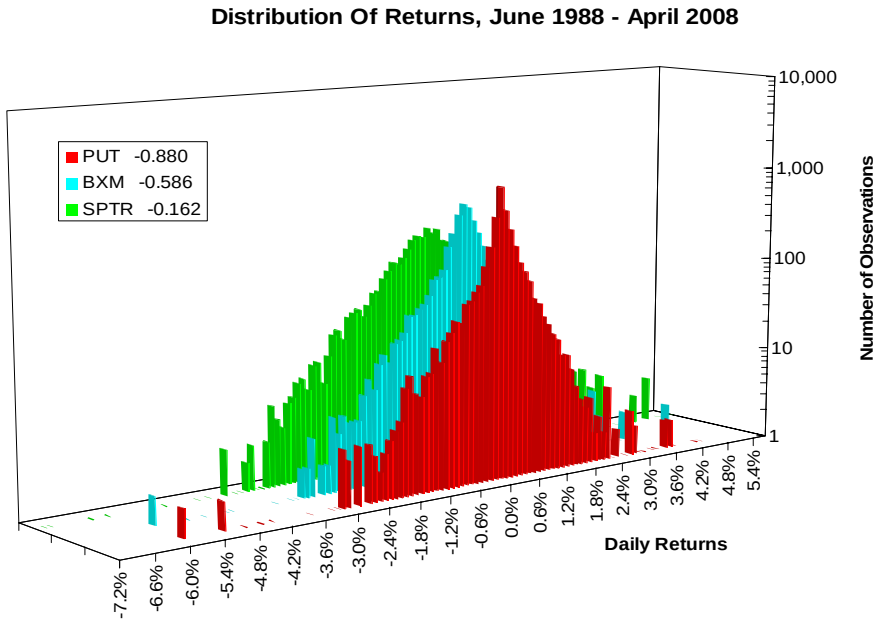
The most important question, though, is whether the PUT outperforms the SPTR. Here the answer is an unqualified, "Yes." It, too, underperformed the SPTR during the long bull market of the 1990s, but once the bear market ended and volatility went on a multiyear decline between 2003 and 2007, the PUT outperformed significantly.



Sources Of Outperformance

Most investors have been taught stocks' long-term outperformance of other asset classes is based on their embedded call option. Here we have two strategies, or at least two backcasts of strategies, where no long call option is present and yet their performance before taxes and costs is superior to the SPTR's. In the case of the PUT in particular, we might conclude stocks' systematic outperformance is more a function of perseverance in the face of adversity, being short put option volatility, than any portfolio effect of being long embedded call options.

Even stranger, the distribution of the PUT's returns is very negatively skewed, -.880, in reflection of being short put option volatility during a decline. The comparative skews for the SPTR and the BXM are -.162 and -.586, respectively. Restated, the PUT has many more "bad hair days" than do the other indices en route to its superior performance.



The negative skewness of the PUT's returns is consistent with our previous hypothesis that its performance derives from the put skew. Is there another way of testing this?

Hint; It Is Not The VIX

What if we looked at the most common and widely accepted measure of stock market volatility, the VIX? The VIX is somewhat moneyness-weighted as it is built up from the volatility smile of index options, and as a result blurs the put skew. If we get counterintuitive results from comparative performance measures involving the VIX, we should have greater confidence in the put skew as a source of performance.

The charts below use the following measures. The y-axis values are:

$$Trend = \frac{P_0 - \frac{1}{21} * \sum_{i=-20}^{0} P_i}{P_0}$$

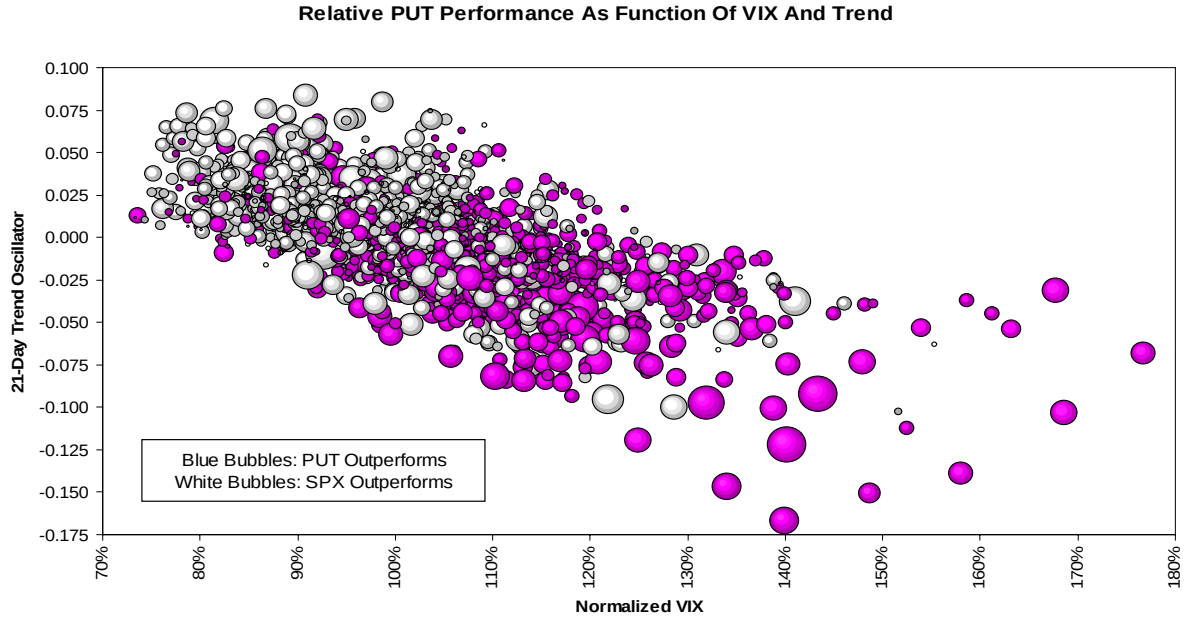
The x-axis values are:

$$Normalization = \frac{VIX_0}{\sum_{i=-20}^{0} VIX_i}$$

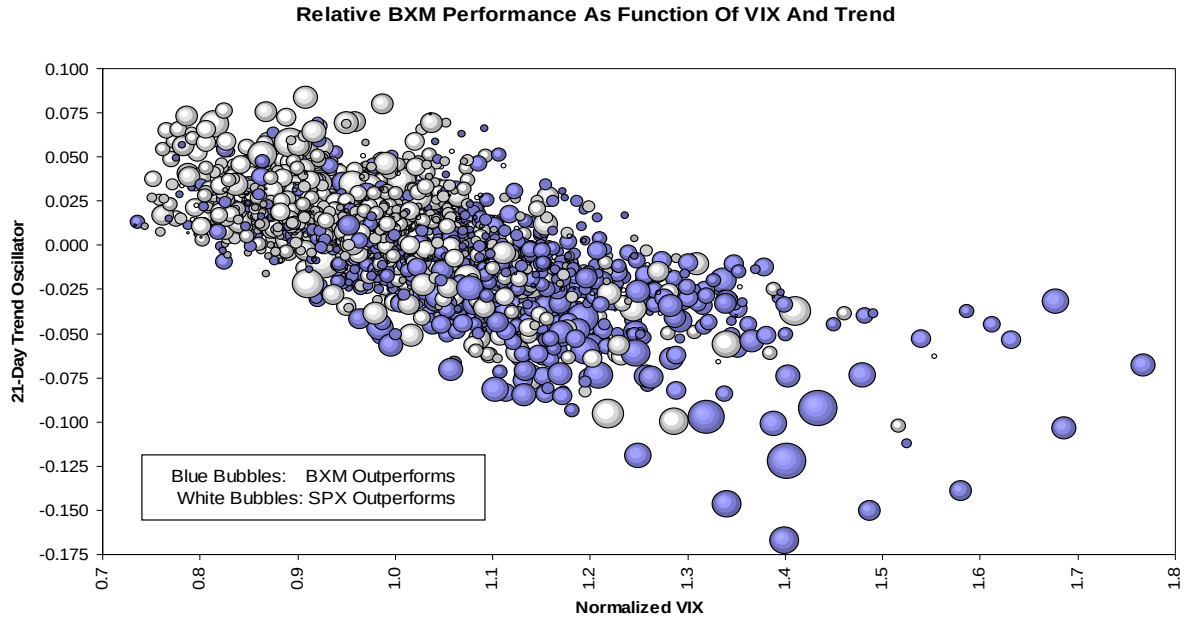
The bubble sizes are:

$$Bubble = \frac{1}{5} * \sum_{i=1}^{5} \ln\left(\frac{Strategy_i}{Strategy_{i-1}}\right) - \ln\left(\frac{SPTR_0}{SPTR_{i-1}}\right)$$

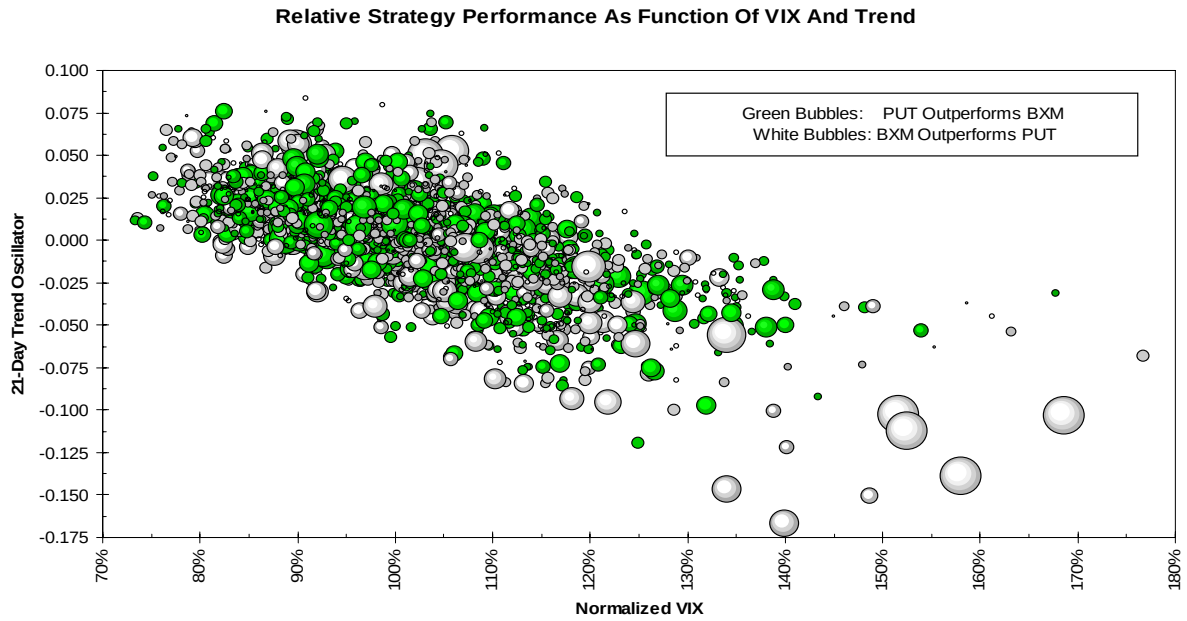
The first chart maps the average 5 day-ahead returns for the PUT relative to the SPTR against a 21-day trend oscillator and a normalization of the VIX against its previous 20 days. The largest outperformance (magenta bubbles) occurs during times of a market downtrend combined with a high normalized VIX level. This is exactly what we should expect.



The next chart does the same mapping for the BXM, and the result pattern looks similar, as it should. The blue bubbles are in the same high volatility/negative trend quadrant.



So far, so good. All we have done is demonstrate one synthetic short put option's forward-looking profit profile looks like another's. Now let's subtract the two strategies' relative performances and see where the differences lie.



The BXM outperforms the PUT after those periods of high volatility downtrends. This surprising zone of underperformance for the PUT suggests its success depends not on any ordinal level of the VIX and certainly not on the VIX' trend, but rather on the systematic capture of some other phenomenon, such as the put skew.

More important, the success of the PUT strategy over time was concentrated during the 2003-2007 period of a declining VIX. Unlike many other volatility-based trading strategies, the PUT does not depend on waiting for periodic surges in the VIX. Regular stock market noise and the normal put skew will do just fine, thank you very much.