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Consider Your Options

If you are like many investors, you will have your beneficiaries' assets in a diversified portfolio of equities and bonds, alongside a marginal allocation to some alternative assets. In the past, if you thought the business cycle was mature and that equities looked expensive relative to the generous yields you could get from bonds, you would adjust your portfolio from stocks to fixed income. If you thought that a recession had bottomed-out and that equities looked cheap relative to safe-haven bonds, you would adjust your portfolio to position for a recovery in stock markets.

Today, we appear to be nearer the end of a business cycle than its beginning. Equities, as one might expect, look fully-valued, with the U.S. large-cap price-to-earnings multiple rising above 25-times as of the beginning of October 2018, delivering an earnings yield of barely 4%. But after the financial crisis of 2008 – 09 and a decade of below-trend growth and central bank quantitative easing, bond yields are not just unusually low but historically low, and not falling but rising.

In short, neither of the two major asset classes seem particularly good value relative to one another or to their own histories.

Some investors respond to this by increasing their allocations to alternative investments such as equity long/short hedge funds that seek to avoid exposure to the day-to-day volatility of the public equity and bond markets. Others look to pay explicitly for portfolio insurance in anticipation of declines in equity markets—an approach that we regard as ineffective and expensive.¹

Others try to reduce portfolio volatility levels by making their equity allocations more “defensive”—by selecting larger companies in sectors that tend to have steadier earnings streams, pay higher dividends and hold less debt—or by selecting stocks that have exhibited lower historical volatility. It is this last approach we find most likely to be challenged at this stage of the business cycle. There is a limit on what can be gained by rearranging the chairs on the deck of the S&P 500.

With the unique challenges facing investors, we believe there is a relatively more attractive option to express defensive equity views that can complement or supplement alternative equity and existing lower volatility equity allocations: writing collateralized index put-options.

1. See “Chasing Your Tail” at <https://www.nb.com/layouts/www/transfer.aspx?URL=/insights/chasing-your-tail.aspx>

Beware Expensive High-Dividend Stocks with High Interest-Rate Sensitivity

A strategy that systematically selects stocks with lower historical volatility ends up with very similar exposures to one that selects deliberately for defensiveness. Relative to the full S&P 500 Index, the S&P 500 Low Volatility Index (SP5LVI) and the MSCI Minimum Volatility USA Index are tilted toward mega-caps, and substantially underweight energy and information technology and overweight utilities and consumer staples, for example.

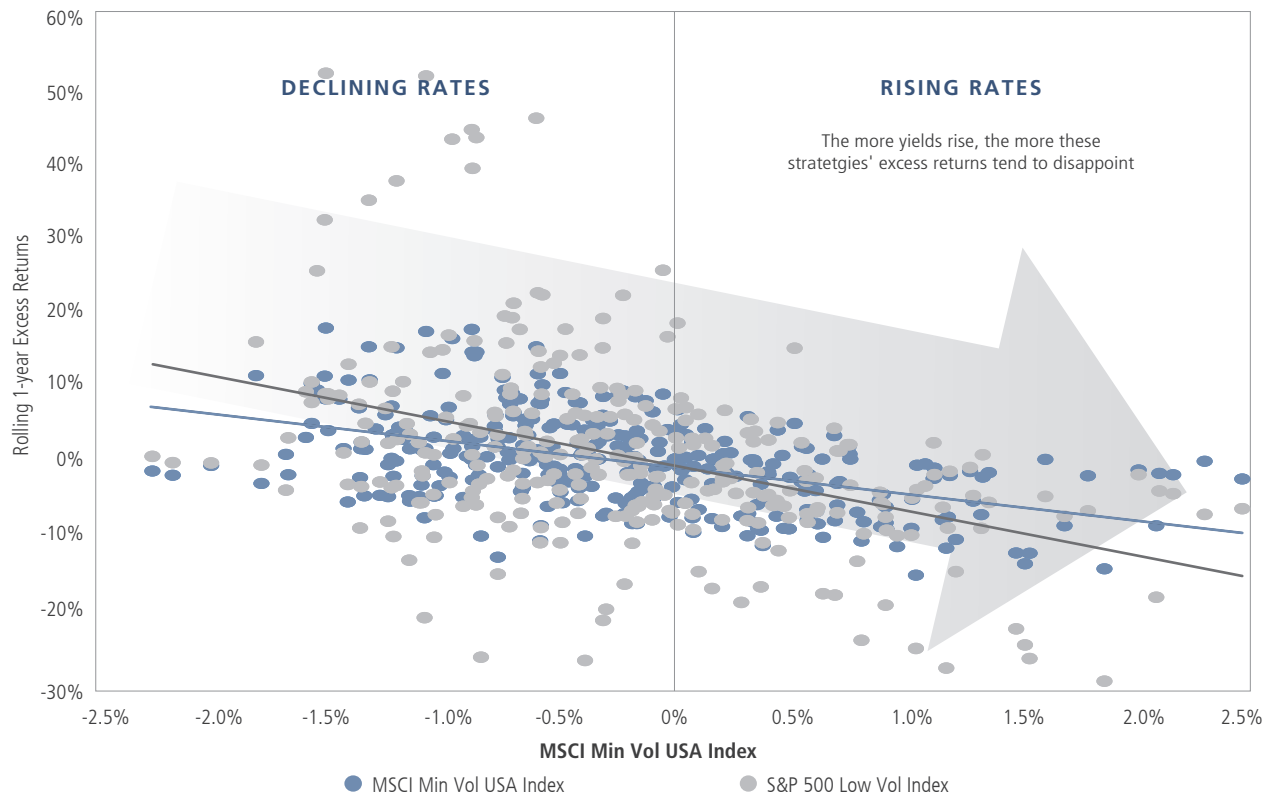
Statistically, this has led to these strategies exhibiting only 60-70% of the broad market's volatility, and exposed it meaningfully to the value factor. Many argue that these exposures help explain how they outperform the market over time: the steady earnings and dividend payments of their "boring" stocks are overlooked and therefore consistently cheap to buy, and the lack of volatility makes for more efficient compounding.

Today, however, these stocks are not particularly cheap. There may be something even more important than valuation to consider, however. We feel that there is a persistent risk associated with these kinds of strategies that investors should be aware of in a time when bond yields are low and rising. Their performance, like that of bonds, has tended to be very sensitive to changes in interest rates.

We show this in figure 1 by plotting the excess return of the S&P 500 Low Volatility and the MSCI Minimum Volatility USA Indexes over their respective full-market benchmarks against the change in the yield of the 10-year U.S. Treasury bond, over rolling 12-month periods. Both of these systematic, statistical low-volatility equity indexes have tended to outperform when the 10-year yield declined and underperform when rates were rising—and the tendency has been especially pronounced for the SPLV Index, the less constrained of the two.

FIGURE 1. STATISTICAL LOW-VOLATILITY EQUITY INDICES EXHIBIT INTEREST RATE RISK

Excess returns over the S&P 500 Index and the MSCI USA Index, versus the change in the 10-year U.S. Treasury yield, May 1988 (for the MSCI Minimum Volatility USA Index) and November 1990 (for the S&P 500 Low Volatility Index) to August 2018



Source: Bloomberg, Neuberger Berman.

If an investor has selected one of these statistical solutions to lower overall portfolio volatility instead of tilting more toward low-yielding, expensive bonds, this correlation with bond-market performance clearly raises urgent questions.

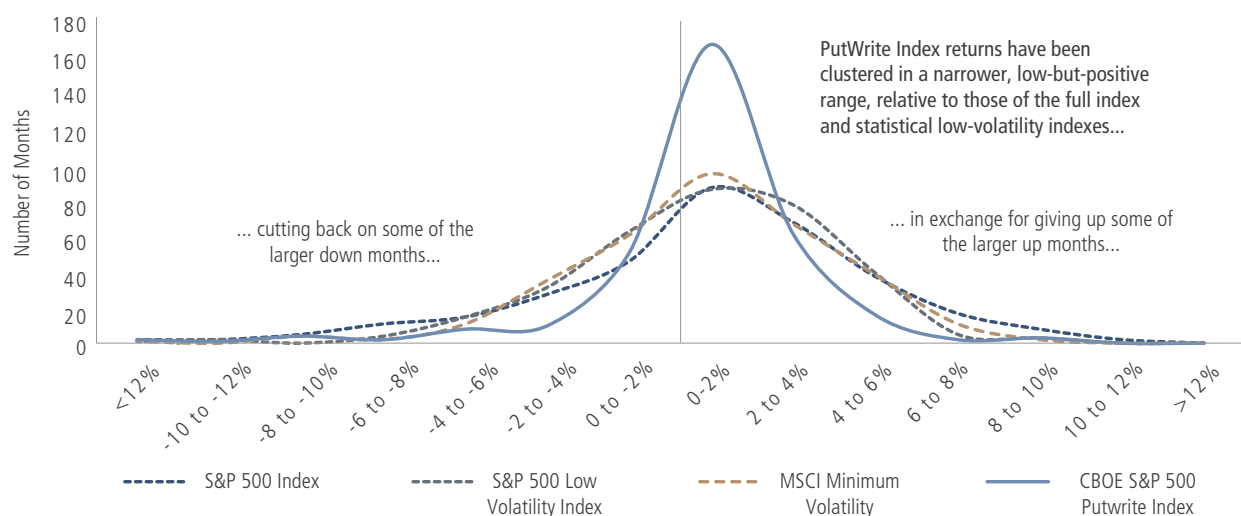
Equity Index Put Writing: Index-Like Returns with Lower Volatility...

Is there a way to reduce the volatility of equity allocations and the severity of their drawdowns without allowing interest rate risk to sneak in by the back door? We believe so.

A systematic index put-option writing strategy, represented here by the CBOE S&P 500 PutWrite Index (PUT), has tended to exhibit structurally lower volatility than the underlying index itself without impairing long-term returns. Historically, it has delivered returns that cut back on some of the worst periods of performance of the equity index itself in exchange for giving up some of the (less frequent) periods of exceptionally high returns, as shown in figure 2. Over time, that has resulted in lower beta and improved drawdowns.

FIGURE 2. AN EQUITY-INDEX PUT-WRITING STRATEGY CAN “CUT THE TAILS” OFF OF THE UNDERLYING INDEX

Number of months exhibiting a given range of return, December 1990 to August 2018



RETURN & RISK STATISTICS

December 1990 to August 2018

| | CBOE S&P 500 PutWrite | S&P 500 Index | S&P 500 Low Volatility Index | MSCI USA | MSCI USA Minimum Variance Index |
|----------------------|--------------------------|------------------|------------------------------------|--------------|---------------------------------------|
| Total Return | 9.9% | 10.5% | 11.1% | 10.6% | 10.8% |
| Volatility | 9.5% | 14.0% | 10.7% | 14.0% | 11.0% |
| Risk-Adjusted | 1.04 | 0.75 | 1.04 | 0.76 | 0.98 |
| Beta to S&P 500 | 0.56 | 1.00 | 0.58 | 1.00 | 0.73 |
| Median 30-Day Return | 1.1% | 1.3% | 1.2% | 1.3% | 1.2% |
| Up-Market Capture | 63% | 100% | 72% | 100% | 79% |
| Down-Market Capture | 41% | 100% | 48% | 100% | 65% |
| Max Drawdown | -33% | -51% | -35% | -51% | -41% |

Source: Bloomberg. The CBOE S&P 500 PutWrite Index (PUT) launched in June 2007 with historical backtested data available since 30 June 1986.

What is the source of this particular distribution of returns?

A put option is a financial contract. It enables the put buyer to sell a security or an index at a certain price (the “strike price”). As such, index put options are a basic form of insurance contract, bought by investors to protect against losses in their equity portfolios. Like all insurance, buyers tend to pay for a policy they hope never to collect on, and accept the fact that it is unlikely to be profitable. Hence, over time, sellers of insurance, the writers of equity index put options, are able to earn profits related to equity index risk without owning the equity index outright.

An index put option premium can be considered the market’s “price” for the risk for owning an equity index (realized volatility) plus a profit margin to compensate the underwriter for the uncertainty associated with pricing equity risk. More formally, the implied volatility of an index option represents an estimate of the index price volatility that is expected to be realized over the life of an option (a forecast of realized volatility), plus an additional spread. That additional spread tilts the probability that the option’s implied volatility will be higher than the index’s realized volatility over the life of the option—a tilt in favor of the seller of the put option. This additional spread or profit margin is commonly known as the implied volatility premium.

As such, the performance of the PUT Index is directly related to the market’s expectations for volatility of the underlying equity index. Importantly, returns are dependent upon neither capital appreciation nor dividends from the underlying equity index.

... and No Meaningful Interest Rate Sensitivity

Is a put-writing strategy sensitive to interest rates in the same way a statistical low-volatility equity strategy has been?

It could possess interest rate sensitivity in two ways. The first is the direct sensitivity of the size of the option premium to the direction of interest rates—what option traders call “rho”. Because of the short duration of the put options written in the PUT Index (approximately 30 days), a movement in interest rates has an insignificant effect on them.

Of greater importance to interest rate sensitivity is the collateral that a put writer must hold against the risk of the contracts it writes. This makes rising interest rates favorable to the put writer, as more interest can be earned on that collateral, which tends to be held as cash or short-term government bonds.

FIGURE 3. AN EQUITY-INDEX PUT-WRITING STRATEGY HAS OUTPERFORMED WHEN INTEREST RATES HAVE RISEN OR DECLINED

| | Cumulative Change 3-mo U.S. T-Bill Rate (bps) | S&P 500 Index Total Return | CBOE S&P 500 PutWrite Index Total Return | PutWrite Excess Return over S&P 500 Index | S&P 500 Low Volatility Index | S&P 500 Low Vol Excess Return over S&P 500 Index | MSCI USA Minimum Volatility Index | MSCI USA Min Vol Excess Return over S&P 500 Index |
|-------------------------|---|-------------------------------------|---|---|---------------------------------------|---|--|--|
| Increasing Rates | | | | | | | | |
| Oct 2015 to Aug 2018 | 202 | 14.81% | 8.66% | -6.15% | 12.28% | -2.53% | 13.54% | -1.27% |
| Jan 1994 to Jan 1995 | 297 | 0.51% | 7.32% | 6.81% | -1.26% | -1.77% | -0.09% | -0.61% |
| Sep 1998 to Oct 2000 | 203 | 19.15% | 21.94% | 2.79% | 7.15% | -12.00% | 12.67% | -6.48% |
| Apr 2004 to Jul 2006 | 411 | 8.47% | 9.67% | 1.21% | 10.54% | 2.07% | 10.78% | 2.31% |
| Average | | | | 1.16% | | -3.56% | | -1.51% |
| Decreasing Rates | | | | | | | | |
| Jan 1991 to Sep 1992 | -364 | 16.00% | 16.15% | 0.15% | 14.64% | -1.36% | 16.28% | 0.28% |
| Oct 2000 to May 2003 | -511 | -12.98% | -5.02% | 7.96% | 6.66% | 19.64% | -6.47% | 6.52% |
| Jan 2007 to Dec 2008 | -503 | -19.79% | -11.77% | 8.01% | -12.01% | 7.78% | -13.20% | 6.58% |
| Average | | | | 5.38% | | 8.69% | | 4.46% |
| Flat Rates | | | | | | | | |
| Sep 1992 to Jan 1994 | 29 | 14.28% | 14.28% | 0.00% | 12.39% | -1.89% | 15.15% | 0.87% |
| Jan 1996 to Aug 1998 | -22 | 19.33% | 15.54% | -3.78% | 13.55% | -5.77% | 15.64% | -3.69% |
| Dec 2008 to Oct 2015 | 2 | 15.41% | 11.37% | -4.03% | 14.79% | -0.62% | 15.14% | -0.27% |
| Average | | | | -2.60% | | -2.76% | | -1.03% |

Source: Bloomberg. The CBOE S&P 500 PutWrite Index (PUT) launched in June 2007 with historical backtested data available since 30 June 1986.

Let us bring all of those dynamics together. Figure 3 shows how the PUT Index has performed relative to the S&P 500 Index and to the S&P and MSCI low-volatility equity indexes during periods of rising, declining and flat interest rates, between 1986 and the present.

As Figure 1 already suggested, the statistical low-volatility strategies have shown marked interest rate risk, outperforming the S&P 500 Index strongly when rates decline and lagging it when rates rise. The PUT Index, however, outperformed on average when rates were declining and when they were rising. All three strategies underperformed the S&P 500 when rates were flat and directionless.

We would hypothesize that the PUT Index tended to outperform during periods of both rising and declining rates because an adjustment in interest rate regime is often associated with a less directional, higher-volatility equity market—recall that index option premiums are higher when equity index volatility is higher. In addition, the PUT Index’s collateral portfolio, a blend of one- and three-month U.S. Treasury Bills, would have benefitted from rising rates. By contrast, periods of relatively flat interest rates have tended to coincide with the expansionary part of the business cycle, when the equity market puts in its strongest performance and tends to leave lower-risk strategies in its wake.

Conclusion: Remember Underlying Risks when Selecting a Low-Vol Equities Approach

We do not advocate against statistical low-volatility equity strategies. Instead, we encourage investors to be aware of the full scope of the underlying risks of these strategies and to compare them with those of index put-writing strategies. As investors think about how they might reduce the equity-related volatility of their overall portfolio allocations without increasing allocations to low-yielding, expensive-looking bonds, implicit interest-rate sensitivity is one of the most important of those underlying risks.

Many will want to avoid taking an unintended view on what kind of interest rate regime we are entering. Others may wish to take an explicit view on interest rates and hold that they are much more likely to go up than down from where they are today. In that case, they might consider the interest rate sensitivity that statistical low-volatility strategies have exhibited in the past and be cautious in assuming that they will continue to behave as “low-risk”. In either case, we believe that the prudent course for investors would be to diversify their “defensive” equity, and their alternative equity portfolios, by incorporating put writing into their lower volatility allocations. We see that as a means to achieve their investment objectives without allocating more to bonds and without taking on additional interest rate risk.

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