As the Cycle Lengthens, Investors Look to Hedge Tail Risk—But at What Price?

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Tail Risk Concerns
As the cycle extends, investors become more interested in hedging against the next pullback

Tactical Downside Mitigation
Approaches ranging from options and government bonds to long or minimum volatility can align with a plan's objectives

Balance Costs and Opportunities
Weigh up the costs and benefits, and assess the market environments in which these strategies typically succeed
As the equity bull market enters its ninth year and with the global economic recovery nearly as long in the tooth, investors are understandably concerned about the next pullback: when will it hit and how severe could it be?

While the VIX has hovered at historic lows over the last year amid stable global growth and low inflation, the SKEW Index suggests investors are indeed concerned with tail risk events.

While we agree that timing markets is notoriously difficult, there are many ways investors can consider hedging tail risk. However, the two main questions are: what kind of risk mitigation and at what price?

Investors must also weigh up the costs and benefits of tactical hedges (and for how long?) against more strategic defensive strategies.
Put options are often the first defense that comes to mind for investors. These are an explicit insurance contract, guaranteeing protection if market prices fall below the strike price. But they come with significant costs.

Figure 1 plots historical premiums for both 10% and 20% out-of-the-money (OTM) put options over time. These prices vary in proportion to the level of expected volatility. On average, a 10% OTM put option, expiring in one year, costs 5%. This means the market has to fall 15% before the put option provides any real protection.

In order to reduce these costs, institutions could sell other options, such as OTM calls, or deeper OTM puts. Selling both calls and puts is called a "put spread collar," and can be constructed at zero cost. But selling call options reduces the upside, which is the reason most investors are exposed to equities in the first place. While this approach might be appropriate for some investors, it may add unnecessary complexity to an investment plan, especially compared to other approaches.

If investors choose options, then they have to consider liquidity and implementation, especially if they need scale. For example, it is possible to hedge $1–$2 billion of S&P 500 equities in a single trade using listed options. Trades that hedge more than $5 billion in a single execution may need to be executed over the course of a day. Single trades larger than that would need to be executed in tranches over several days. Over-the-counter options offer greater liquidity than listed options and should be considered for execution. Another potential way to mitigate liquidity risk with S&P 500 index options would be to expand the hedging program to other equity markets such as EuroStoxx or another highly correlated exposure.

Finally, we recommend that option positions be executed in stages across maturities and strikes. This can mitigate path dependency and roll risk, and it allows for multiple counterparties, better protecting the investor from adverse information flow.
The mere suggestion of owning longer-duration US Treasuries, UK gilts, JGBs (Japanese government bonds) or German bunds evokes quizzical looks from many plan sponsors and Chief Investment Officers. After all, most investors are convinced that interest rates can only go higher from here. But government bonds, unlike other assets, are negatively correlated with equity prices and therefore excellent candidates for tail risk protection. Not only do US Treasury prices often rise during a period of market distress, they offer a positive (albeit small) nominal yield. Figure 2 shows this relationship over time, plotting the total return of the long US Treasury Index during various equity market regimes. Notice that during the months when equities fall more than 5% on average, long US Treasuries rise over 2%, helping to cushion the blow in a bear market. Most assets exhibiting this type of tail risk protection entail a cost, as opposed to a small nominal yield.

Figure 2
Average Monthly Return of Bloomberg Barclays Long Treasury Index For Various Equity Returns, September 1992–August 2017

Sources: SSGA, Bloomberg Finance L.P. Data as of August 2017. Past performance is not a guarantee of future results. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect capital gains and losses, income, and the reinvestment of dividends. Performance is calculated in USD. You cannot invest directly in an index.

Of course, government bond correlations can change, as with an inflationary spike or aggressive monetary tightening. In February 1994, for example, the Federal Reserve began tightening, raising the fed funds rate from 3% to 6% in one year, putting both equities and Treasuries under pressure. Still, such episodes are generally short-lived, allowing correlations to reset over the long run. We are generally supportive of owning long-duration bonds, as they create important opportunities around portfolio construction.

Long Volatility to Manage Multiple Regimes

Another approach is to choose investment strategies that are long volatility. Volatility-based strategies come in various forms, including systematic managed futures (CTAs), target volatility triggers (TVT) and risk parity.

CTA managers generally trade futures contracts and use momentum in determining their long and short positions. They will take both long and short positions on a variety of contracts, based on trend signals. As such, these strategies mimic being long both a put and
Low Beta or Minimum Volatility Equities

Significant flows have poured into low beta equity strategies over the past five years. According to eVestment, over $250 billion is now invested in the global “Low Volatility Equity” category.¹ Yet this might understate low vol’s true measure, as it might not capture long-short structures or flows to managers who mimic this style under a different name (for example quality).

Low beta equity strategies are based on the observation that equity beta risk has not been compensated, which is a direct challenge to the central prediction of the Capital Asset Pricing Model (CAPM). The idea is to purchase low beta stocks and avoid high beta stocks. This method generally leads to a portfolio with significantly lower equity volatility, but high active risk relative to standard capitalization-weighted benchmarks. Our research shows that a benchmark-unaware low beta strategy generates approximately 30% less volatility than standard market indices.

Given the significant inflows into low beta strategies, investors look for signs of crowding, which is something we seek to track carefully. Figure 3 looks at the summary statistics of decile portfolios that are sorted from high to low beta. The top row captures the highest-beta stocks, while the bottom row the lowest-beta stocks. Notice that the top portfolio has the...
Each of these methods should be considered in the context of the total portfolio. The ultimate hedging program needs to align with the plan’s overall return and risk objectives.

Put options are a reasonable choice if the desire is to increase the predictability of the ultimate return distribution or if there is an explicit need to hedge a certain short-term risk. But it may not be the best long-term solution for many investors because it constrains the upside of equities. We have found it difficult to design a put protection strategy that doesn’t show up as a long-term drag on portfolio performance. Still, that might be less important for over-funded pension plans or for conservative investors more concerned about drawdown risk.

Investors should consider their overall asset allocation and the major factor risks embedded in the plan. Often, the objectives can be met by making a few adjustments across the current set of asset classes. Our preferred approach is to move toward a capital efficient portfolio allocation. We prefer extending duration on high-quality government bonds, freeing up some capital to reallocate to lower beta growth asset classes. These include low-beta equities, target volatility equities, flexible asset allocation or diversified growth strategies and other asset classes like emerging market debt and high-yield bonds. These approaches have the potential to greatly reduce downside risk without compromising the ultimate return objective.

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<td>11.80</td>
<td>0.50</td>
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Sources: SSGA, FactSet, MSCI. Universe: MSCI World Index. Period: January 1999 – December 2016. Past performance is not a guarantee of future results. Index returns reflect capital gains and losses, income, and the reinvestment of dividends. Index Characteristics are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.
**Figure 4**

**Different Approaches to Tail Risk Management**

<table>
<thead>
<tr>
<th></th>
<th>Benefits</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sell Equities</strong></td>
<td>Simple / Direct</td>
<td>Foregone Upside</td>
</tr>
<tr>
<td><strong>Purchase Put Options</strong></td>
<td>Direct</td>
<td>Puts are very expensive</td>
</tr>
<tr>
<td><strong>Buy Long US Treasuries</strong></td>
<td>Inexpensive</td>
<td>Opportunity cost—has low yield</td>
</tr>
<tr>
<td><strong>Managed Volatility (or Min Vol Equity)</strong></td>
<td>Remain fully invested in the market and avoid high-beta stocks that often lag the market</td>
<td>Management fees if the strategy is run actively.</td>
</tr>
</tbody>
</table>
| **Target Volatility Triggers (TVT)** | Can be run as an overlay on an entire equity program.                   | • Variable equity exposure may be difficult to grasp for asset owners.  
                              |                                                                          | • High active risk.                                               |
| **Managed Futures**  | Momentum-based trading at the macro level can offer strong downside protection. | High fees (2 and 20) are often paid to the best CTA managers.        |
| **Flexible Asset Allocation** | Asset allocation mix is dynamically adjusted to match expectations about market conditions. | Active fees, though much less than standard liquid alternatives. |

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<table>
<thead>
<tr>
<th><strong>When will it work?</strong></th>
<th><strong>When will it fail?</strong></th>
<th><strong>Keep in Mind</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• When equities decline</td>
<td>• When the market rises</td>
<td>For many investors, this may be better than owning equities and buying puts to protect the downside.</td>
</tr>
<tr>
<td>• Sharp / rapid decline in equities</td>
<td>• Very slow decline in equities, or if market stays flat or moves higher.</td>
<td>Investors need to make the amount that the options are out-of-the-money plus the option premium just to break even.</td>
</tr>
<tr>
<td>• Period of market distress (2008, 2001)</td>
<td>• Equity selloff coincident with an inflationary spike (1980). • Period of aggressive Fed tightening (1994).</td>
<td>Buying Long UST provides a tail hedge with a positive yield (albeit small). However, the protection is not guaranteed.</td>
</tr>
<tr>
<td>• Period of market distress (2008, 2001). • Market with many ups and downs, but a long-term upward trend (2010–2017).</td>
<td>• In a high beta rally (1999, 2009). • In addition, if the factor gets “crowded” or “overvalued” it could be at risk of a large quant factor unwind (2007).</td>
<td>Over the last 10 years, low beta stocks have become marginally more expensive. We monitor metrics that indicate whether low beta stocks are associated with neglect, or with glamour. If the former (which is usually the case), we favor low beta.</td>
</tr>
<tr>
<td>• In trending markets, in particular if market has a strong downward trend (2000–2002, 2007–2008).</td>
<td>• Choppy markets, with many ‘head fakes’ (Taper Tantrum, 2013 or the overall market environment since the era of QE). • Does not protect in Gap Downward market—with an exogenous shock (e.g. Tsunami).</td>
<td>• More asset owners are looking at this as a possible tail risk solution. It has not worked very well as of late. • The strategy has been caught’chasing it’s tail’ over the past few years.</td>
</tr>
<tr>
<td>• Very similar in effect to TVT</td>
<td>• Very similar in effect to TVT</td>
<td>This strategy works when volatility is rising and spiking. It makes a good tail hedge for equities and should negatively correlate to equities over time.</td>
</tr>
<tr>
<td>• Similar to TVT and Managed Futures, • Has done well in 2017 with a trending up market and persistently low volatility.</td>
<td>• When the market regime is going back and forth from a high-risk to a low-risk regime. • In this case, you get caught “chasing your tail”. • This strategy does not hedge equity risk as a stand alone.</td>
<td>Similar to managed volatility equities, it is still a growth strategy with positive beta. It also potentially makes a nice equity substitute.</td>
</tr>
</tbody>
</table>
Glossary

**Bear Market**
A market environment in which the value of securities is falling, or expected to fall.

**Beta**
A measure of a fund's sensitivity to market movements.

**Call Option**
A contract that provides the buyer of the option the right to purchase a specific number of shares at a specific price, within a specified period of time.

**Capital Asset Pricing Model (CAPM)**
A financial model that uses the risk-free rate, systematic risk and a market risk premium to determine an appropriate required rate of return on an asset.

**MSCI World Index**
A broad global equity benchmark that represents large and mid-cap equity performance across 23 developed markets countries. It covers approximately 85% of the free float adjusted market capitalization in each country and does not offer exposure to emerging markets.

**Out-of-the-Money (OTM)**
A situation in which exercising an option would result in the investor making a loss. For call options, this occurs when the price of the underlying asset is lower than the option's strike price. For put options, this occurs when the price of the underlying asset is higher than the option's strike price.

**Put Option**
A contract that provides the buyer of the option the right to sell a specific number of shares at a specific price, within a specified period of time.

**Skew Index**
The SKEW index is a measure of potential risk in financial markets. The SKEW index can be a proxy for investor sentiment and volatility.

**S&P 500 Index**
A market value weighted index of 500 stocks that reflects the performance of a large cap universe made up of companies selected by economists; the S&P 500 is one of the common benchmarks for the US stock market, and investment products based on the S&P 500 include index funds and exchange-traded funds.
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