Alternative Thinking

Tail Hedging Strategies

Many investors insure against tail risk directly, often by purchasing puts or structuring collars. Unfortunately, experience and financial theory suggest that the long-term cost of such insurance strategies will be larger than the payouts.

We describe an alternative approach to hedging a portfolio's equity tails.

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Tail Hedging Strategies

Executive Summary

- We believe tail hedging strategies can have a role in portfolios, but traditional approaches leave room for improvement
- We describe three strategies that have empirically shown a tendency to provide protection against large losses in equity markets, and more attractive returns than passive exposure to equity put options
- Finally, we argue diversification should have a role in a tail hedging strategies

Why Tail Hedges?

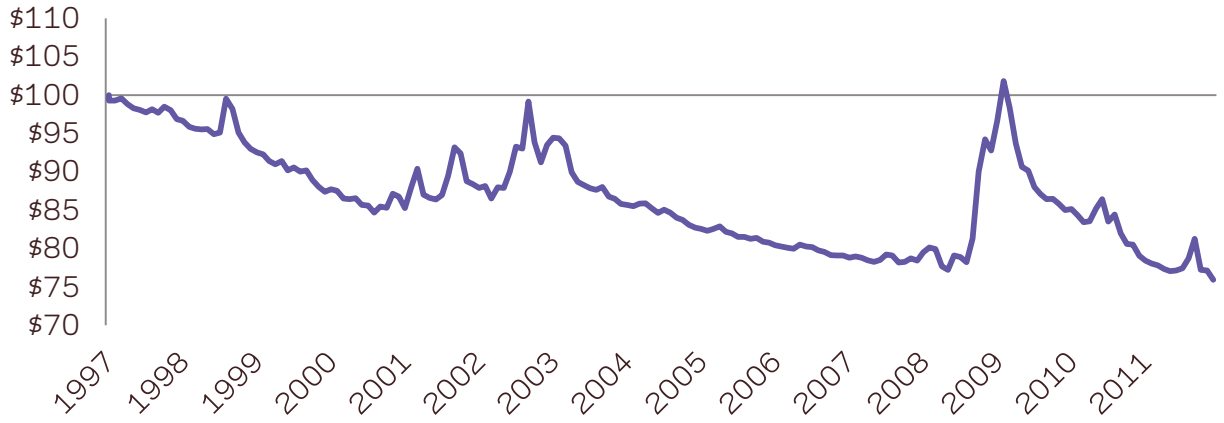
Tail hedges are one way to potentially limit losses in adverse markets. They may better enable investors to stick with their positions through bad times and thus be long-term. Tail hedges may even create potential for investors to opportunistically pick up risky assets in times of market distress (often at fire-sale prices).[1]

Traditionally, tail-hedging strategies rely on the equity index options markets, which offer downside protection, but at a substantial cost. Not only do these strategies carry a negative long-term expected return, they also tend to be more expensive when most needed. Economically, this makes sense, as investors should expect to pay for the right to transfer risk to another party, and to pay more when that risk is greater. However, the high cost makes it less likely that investors will have patience to keep bleeding the "insurance costs" through sometimes many years of normal market conditions (**Exhibit 1**).

An Alternative Tail Risk Strategy

An alternative approach should be more cost-effective and provide protection against the dominant risk in a portfolio – typically, equities. Trend-following strategies are one example: They cannot give as reliable downside protection as index puts, but they have provided surprisingly consistent safe-haven services when most needed, while delivering positive long-run returns. A recent AQR white paper shows that a simulated trend-following composite earned positive returns impressively in nine of the ten worst drawdowns of a 60/40

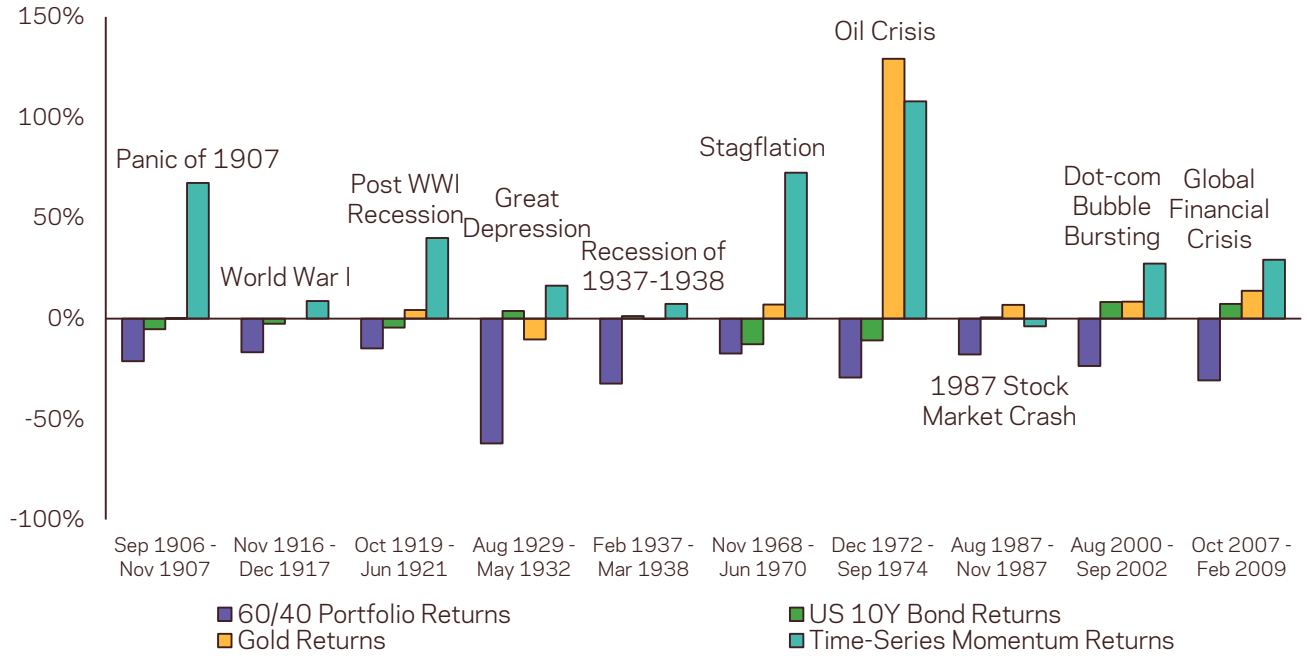
Exhibit 1 | *Hypothetical Cumulative Growth of $100 into 1-Year OTM Puts on the S&P, 1996 - 2012*



Source AQR. Notes: The put portfolio buys one-year SPX 10% out-of-the-money (OTM) index puts (constant notional sizing, combining March, June, September and December options with equal weights). Chart is provided for illustrative purposes only and is not based on an actual portfolio AQR manages. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix hereto. Past performance is not a guarantee of future performance.

[1] See our white paper "Chasing Your Own Tail (Risk)" for more on pitfalls and potential solutions to tail risk hedging.

Exhibit 2 | *Total Returns of a U.S. 60/40 Portfolio, 10 Year US Bonds, Gold, and a Hypothetical Trend-Following Strategy in the Ten Worst Drawdowns for 60/40, Simulated Data, 1903–2012*



Source: "A Century of Evidence on Trend-Following Investing" by Hurst, -Ooi and -Pedersen (2012). The Hypothetical Trend-Following Strategy performance is a backtest for the time period January 1903–December 2012, gross of fees. The 60/40 portfolio has 60% of the portfolio invested in the S&P 500 Index and 40% invested in U.S. 10-year bonds. The portfolio is rebalanced to the 60/40 weights at the end of each month, and no fees or transaction costs are subtracted from the portfolio returns. Please read performance disclosures in the Appendix for a description of the investment universe and the allocation methodology used to construct the Trend-Following Strategy. Markets considered only where data existed during the time period. Chart is provided for illustrative purposes only and is not based on an actual portfolio AQR manages. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix hereto. Past performance is not a guarantee of future performance.

stock/bond portfolio since 1903 (see **Exhibit 2**). More-typical safe haven assets – gold and Treasuries – did not provide as consistent downside protection.

We believe in diversification also when it comes to cost-effective tail hedges, so we look at multiple strategies. Because equity markets can suffer for different reasons, tail risk strategies should be diversified to benefit across a range of weak macroeconomic environments. We think core components of cost-effective approach to tail hedging should include:

- Customized Trend Following – strategies designed to profit from persistent trends in equity, fixed-income, currencies and commodities markets. These strategies can be customized with the goal of protecting investors from sudden losses in equity markets; for example, they can be constrained against taking net long positions in equities.

- Defensive Equities – a stock selection strategy based on company fundamentals. Such a strategy may seek to capture the relative outperformance of high-quality companies during weak equity markets. We find that a long/short stock selection strategy based on measures of companies' quality and risk delivers negative beta to the market with zero-to-positive long-term expected returns.

- Global Macro – a diversified set of dynamic strategies that deliver tactical exposures to safe-haven assets (long), risk premia (short), and volatility (long). For example, the strategy may seek long exposures to safe-haven assets such as sovereign bonds when bonds are perceived to be

attractive, and may seek short exposure to risk premia such as the credit risk (by purchasing credit default protection) when credit is perceived to be expensive.

All these strategies are designed to perform especially well through weak equity markets when most investments suffer. **Exhibit 3A** illustrates the average performance of three investment styles from extremely weak through extremely strong equity markets. Even though each of these approaches exhibited smaller "tails" than a 60/40 portfolio, a risk parity portfolio of market risk premia and a hedge fund index still lost money in the worst equity market episodes since 1990, and a portfolio of hedge fund risk premia was barely flat.

In contrast, **Exhibit 3B** shows that the three tail-risk strategies described above performed well in negative tail events – exhibiting appealing convexity overall, as they were designed to do.[2]

Exhibit 3A | *When Equities Suffer, So Do Many Other Strategies, 1990-2012*

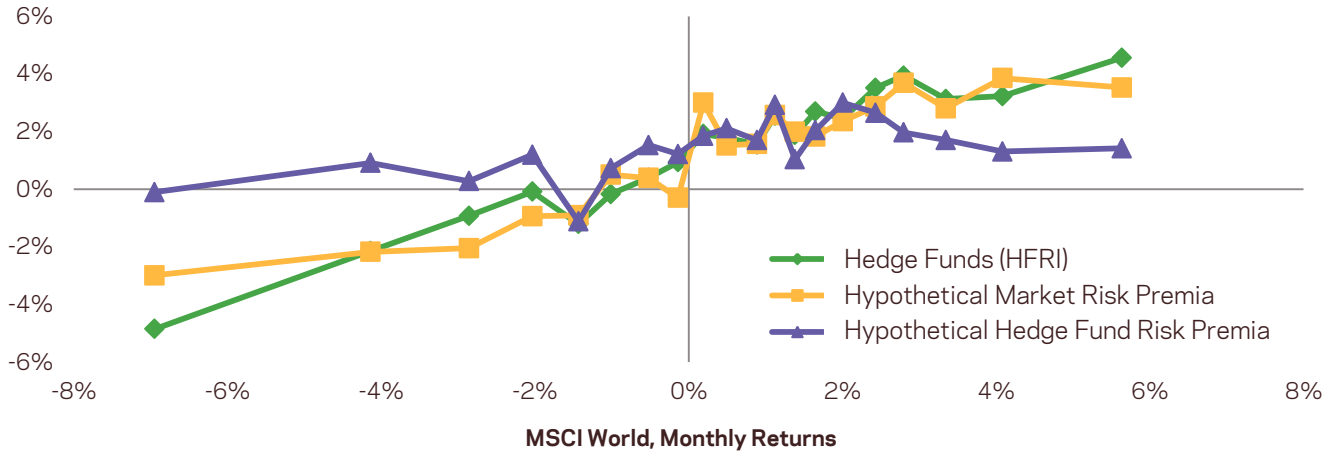
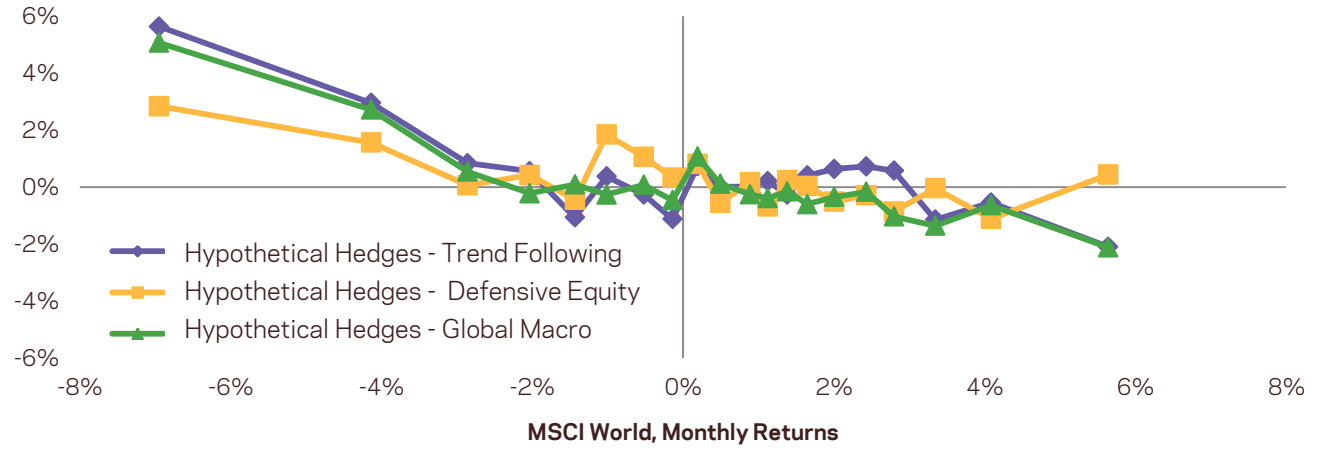


Exhibit 3B | *Protection from Equity Tails, Without Poor Returns in Normal Markets, 1990-2012*



Source: AQR. The hypothetical portfolios have been created for illustrative purposes and and are not based on an actual portfolio AQR manages. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix hereto. Past performance is not a guarantee of future performance. Broad-based securities indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index.

[2] One can link the patterns in Exhibits 3A-B to equity market correlations. Hedge fund indices and market risk premia have equity market correlations above 0.5. Hedge fund risk premia, when properly designed to target market-neutrality, have a market correlation below 0.2. They are better diversifiers but still not tail hedges for the downside scenarios.

A diversified composite of these three strategies would have provided clearly more cost-effective tail protection than the put option buying approach shown in Exhibit 1. Regressing the simulated composite on the 1-year 10% OTM put strategy between 1997 and 2011 would have provided significant alpha, with a beta of one and correlation 0.74 between the two series.

In all, we believe cost-effective, proactive tail hedging strategies, together with drawdown control rules, can offer valuable downside protection for portfolios when most needed.

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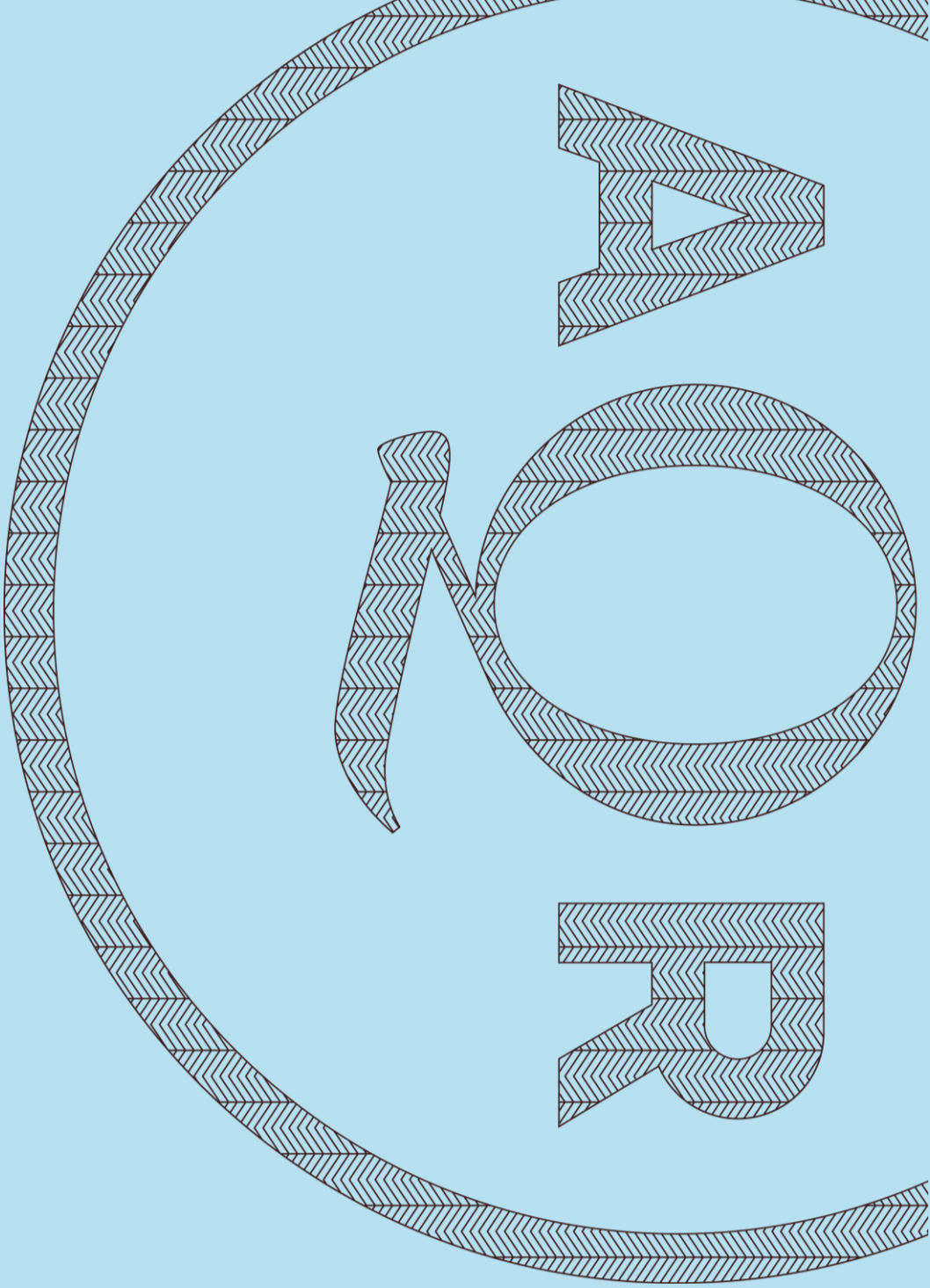
The white papers discussed herein can be provided upon request. Times Series Momentum Strategy:

The Time Series Momentum Strategy was constructed with an equal-weighted combination of 1-month, 3-month, and 12-month time series momentum strategies for 59 markets across 4 major asset classes — 24 commodities, 11 equity indices, 15 bond markets and 9 currency pairs

— from January 1903 to June 2012. Since not all markets have return data going back to 1903, we construct the strategies using the largest number of assets for which return data exist at each point in time. We use futures returns when they are available. Prior to the availability of futures data, we rely on cash index returns financed at local short rates for each country. Please refer to the A Century Evidence on Trend Following Investing white paper for additional information. Please inquire at AQR for a copy of this paper.



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