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Who Should Hedge Tail Risk?

In a somewhat ironic turn of events, many investment banks began selling insurance against equity tail risk to institutional investors following the financial crisis. Ironic because one might expect that investment banks, with high leverage and quarterly earnings reports to worry about, would be the natural buyers of such insurance and long-horizon investors the natural sellers.

Surely, those with deep pockets and long horizons, who would be little affected by the crisis, should be selling insurance to those with short horizons and leveraged positions, who would be most highly affected.

Of course, there will always be a price low enough that a given investor would be willing to buy insurance, and there will always be a price high enough that the same investor would be willing to sell insurance. But investors who have long horizons, sufficient liquidity, and low leverage should consider carefully whether, in practice, the price at any given time is low enough that buying tail-risk insurance makes sense for them. That scenario is unlikely because long-horizon investors are not natural buyers of tail-risk insurance.

Investment banks, however, *are* natural buyers of tail-risk insurance. Their business is finding and taking advantage of opportunities to facilitate and profit from transactions in the capital markets.[1] Market making requires short-term, highly leveraged positions. And when you are in the business of making markets, one thing you want to make sure of is that if all equity markets around the world plunge overnight, you will not only still be in business the next morning but also be ready to take advantage of the opportunities. Investment banks are not well positioned to benefit from long-term equity market returns in exchange for bearing equity market risk. They typically attempt to monitor and hedge as much risk as possible. But despite their desire to hedge equity risk, they know that tail-risk insurance is almost always very expensive. Although sellers of tail-risk insurance to others, investment banks often buy such insurance themselves. But being sophisticated risk managers, they buy the minimum amount they are comfortable with, source it as cheaply as possible, and expect to lose money on almost all such transactions.

Hedge funds and liquidity providers engaged in short-term, highly leveraged transactions may also find that buying tail-risk insurance makes sense. Such businesses should certainly hedge their equity risk; the difficult questions are how to do so and how much to spend. The first-order hedge should certainly be linear—for example, selling equity futures. Such a hedge is relatively cheap and easy, and any business focused on creating alpha should have a low beta to the market. For additional protection, particularly if their equity exposure would otherwise increase with a market decline, such entities may want to buy just enough tail-risk insurance to defend against a significant short-term market crash.

Well-funded endowments, insurance companies, pensions, and sovereign funds, however, are all natural sellers of tail-risk insurance. Such institutions have long horizons, ample liquidity, and low leverage and, in any case, will be best positioned to provide liquidity in a severe depression or financial crisis.

So, my advice to investors managing such long-horizon funds is to avoid the temptation to blindly buy equity tail-risk insurance and, instead, seriously consider selling such insurance. Before proceeding, investors should ask themselves the following five questions. If the answer to any of these questions is yes, then the fund should certainly consider selling tail-risk insurance.

1. Is my institution likely to be less affected than other investors by a financial crisis?
2. Is today's price of equity tail-risk insurance so expensive that it is at too unattractive a level for me to be buying?
3. Is my equity exposure basically linear?

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4. If my equity exposure is too large, is there a less expensive way to reduce my equity risk?
5. Is the governance structure of the fund leading management to consider buying tail-risk insurance in order to protect itself, which may not be in the long-term best interest of the fund's beneficiaries?

For any investor, the problem with buying tail-risk insurance is that the premium is so expensive. Why is it so high? The historical equity premium is well above 400 bps a year. This high premium reflects the fact that equities pay off when times are good and do poorly when times are bad. Long-term investors buy equities to earn this very significant premium. Selling tail-risk insurance creates a customized exposure to the equity risk premium that cuts off the upside while retaining the full downside. The average return per unit of risk from selling tail-risk insurance is considerably higher than the equity risk premium alone precisely because the losses come at exactly the worst time.

Some long-term investors, however, may believe, with the benefit of hindsight, that their equity exposure was too high before the financial crisis. For such investors, who may now want to reduce their exposure to such events, I suggest that they compare the following three strategies for reducing equity exposure:

- Buy equity tail-risk insurance.
- Sell some equity.
- Sell even more equity exposure and also sell equity tail-risk insurance.

Buying tail-risk insurance, even when it is fairly priced, is the most expensive way to reduce equity risk. To illustrate, let us use positions long the CBOE Volatility Index (VIX) futures as a simple proxy measure of the return on a policy of buying equity insurance. The return on the VIX futures is embedded in the Barclays iPath S&P 500 VIX Short-Term Futures Exchange Traded Notes (VXX). The cumulative historical returns on these notes are shown in **Figure 1**, together with those for a position in the S&P 500 Index over 20 December 2005–9 March 2011.

Let us now consider a long S&P 500 position (Option 1), together with three alternative investment combinations that hedge equity risk over the same period (**Table 1**). **Figure 2** shows these cumulative return series.

Figure 1. Cumulative Historical Returns for the VXX and the S&P 500, 20 December 2005–9 March 2011

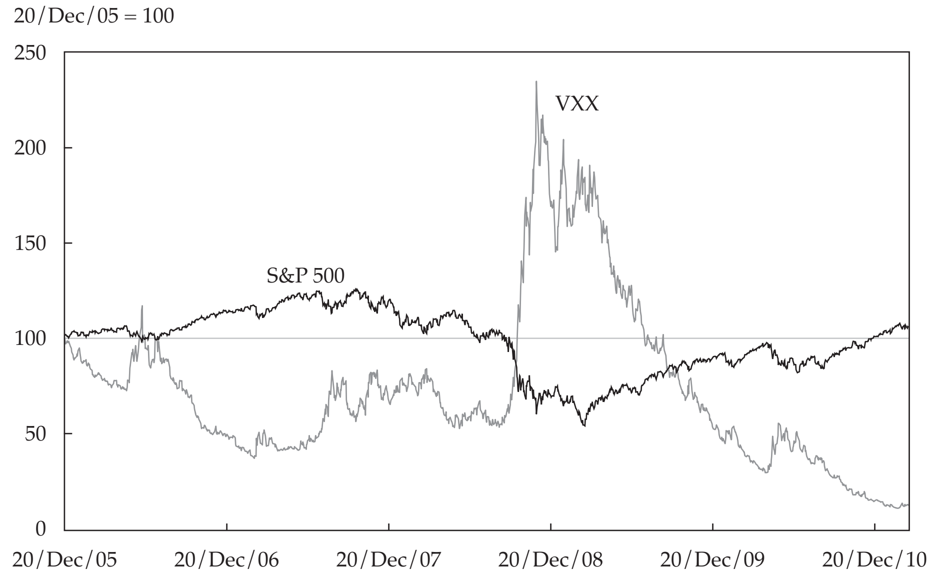

Figure 2. Cumulative Return Series for Various Investment Combinations, 20 December 2005–9 March 2011

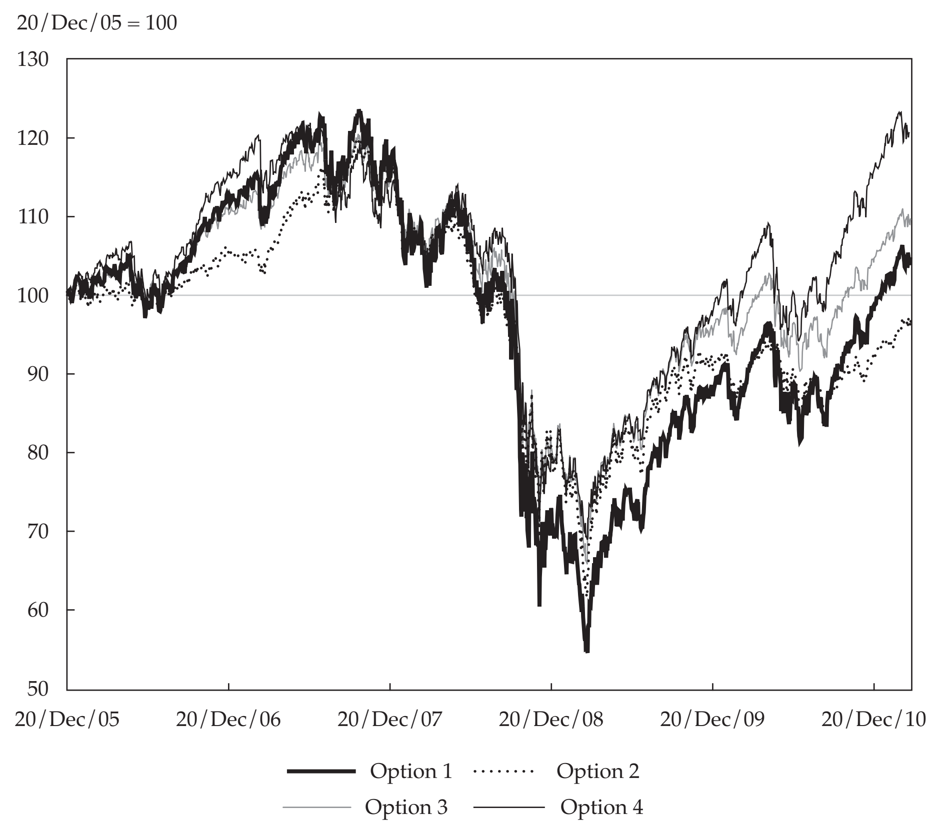

Table 1. Investment Combinations for Hedging Equity Risk, 20 December 2005–9 March 2011

Investment Option	Position Long S&P 500	Position in the VXX	Position in T-Bills	Annualized Volatility	Annualized Return
1	100%	0%	0%	24.5%	0.90%
2	100	10	–10	20.3	–0.65
3	75	0	25	18.4	1.77
4	50	–10	40	17.1	3.66

All three hedging strategies reduce volatility. Over the five-year period, one characterized by a major financial crisis, all three strategies significantly reduced the drawdown during the disruption. The three forms of insurance, however, have very different impacts on return. Tail-risk insurance is clearly the most expensive. A combination of selling equities and selling tail risk has the highest return and lowest risk, even for this period of financial disruption. During more normal times, selling tail risk should perform even better.

Of course, if we look only at the period 2007–2008, when equity volatility was increasing, we see that buying tail risk was the cheapest of the three strategies for buying insurance; but over the five-year period, which includes the financial crisis, it was the most expensive. Because predicting significant financial disruptions is extremely difficult, long-term investors should probably be sellers, not buyers, of tail risk.

My advice to long-term investors is that the next time someone knocks on the door selling a tail-risk insurance product, they should ask for a two-sided market. Perhaps the opportunity is on the other side.

Notes

1. Making markets in less liquid transactions, such as buying and selling tail-risk insurance, is a perfect example.