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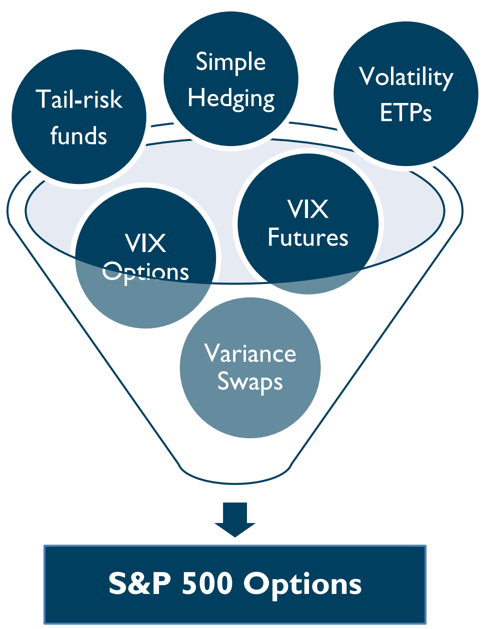
"Remember, it [the market] is designed to fool most of the people, most of the time."
— Jesse Livermore

Tail risk is the topic du jour for global investors and there are many different ways to manage this risk. With the emergence of many volatility exchange traded products (ETPs), it has become all too easy to gain access to hedging solutions.

It is well documented that many of the hedging products available to investors can be quite costly. Additionally, there are unknowns about their performance during different crash scenarios. For example, an instantaneous market crash of 10% is very different than a loss of 1% for 10 trading days in a row. The holy grail of hedging is to own an insurance product that avoids significant bleed in quiet periods while offering the desired protection during volatile periods.

One should consider how these insurance vehicles are ultimately managed. If an investor buys a share of a long volatility ETP like the VXX or TVIX, or buys a VIX option or future, or buys a variance swap on the S&P 500, the counterparty offering those products has the burden of replicating the desired exposure to offset its risk. Generally speaking, this "risk-transfer" finds its way back to the S&P 500 options market and, most of the time, to the out-of-the-money puts.



A benefit of technology and innovation in the financial industry is that investors gain tremendous accessibility and transparency in novel volatility products. However, these benefits often lead to unintended consequences. Given the market turmoil of the past few years, many investors are clamoring to buy these easily accessible equity insurance products and have driven up the price of protection. Increased demand for tail risk hedging can manifest itself in higher prices for out-of-the money puts on the S&P 500 and the steep skew of the options curve.

Investors often insure from a "left tail" event by purchasing out-of-the-money puts (a "left tail" option), regardless of price. This situation is similar to voluntarily paying the price for homeowners or life insurance. You just pay, complain about how expensive it is, and hope that you never need it. The price of insurance, whether in the options market or in the property and casualty market, reflects a "risk-transfer" premium. In figure 1 below, we look at June options in the S&P 500. It is easy to see the sizable open interest on downside strikes as well as the implied volatility premium related to those options. That premium will vary based on supply and demand.

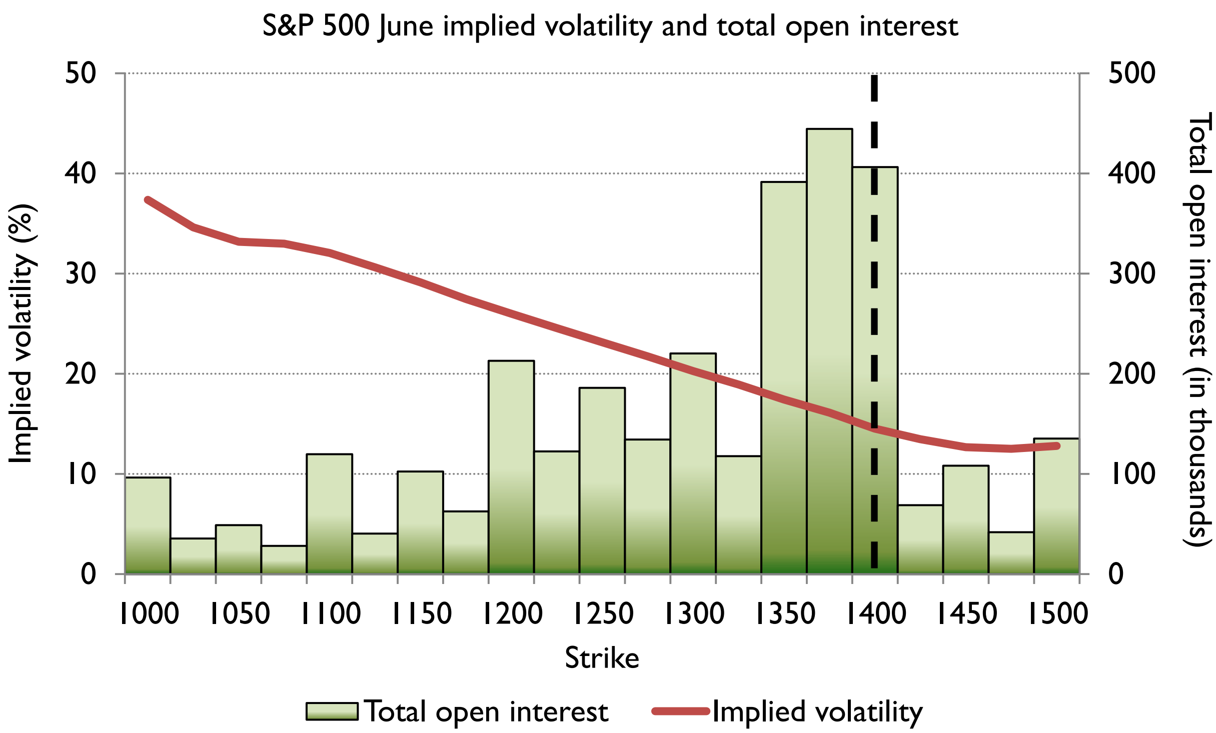


Figure 1: S&P 500 June implied volatility and total open interest by strike. The dashed line indicates the current level of the S&P 500 (i.e. the at-the-money level).

While it may sound counterintuitive, investors can hedge "left tail" events by owning "right tail" options and delta-hedging them. In other words, hedge your downside by buying an upside call and shorting stock delta-neutral. Figure 2 illustrates the performance of such a portfolio during the fall of 2008 as compared to simply buying at-the-money S&P 500 puts.

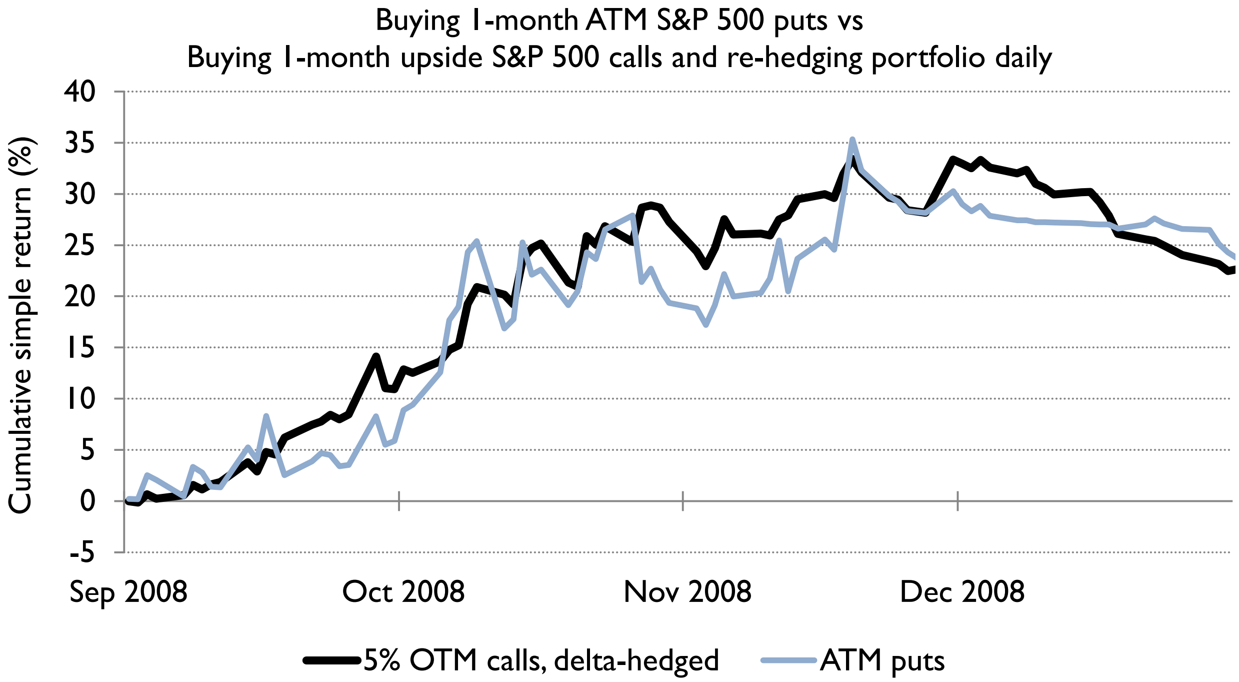


Figure 2: Buying 1-month ATM S&P 500 puts versus buying 1-month 5% OTM 1-month S&P 500 calls, rolling and re-hedging portfolio daily.

Another variation is to maintain long exposure across a variety of call options and short stock to delta hedge. Over the long term, this is generally a losing strategy but is certainly a cheaper way to own an asset that performs in volatile periods than simply buying out-of-the-money puts. An even better alternative is to roll the exposure in order to maintain a constant gamma or vega profile, while optimizing for maximum profit within a tight band of risk constraints. This would be done with movements in the underlying spot price, absolute levels of implied volatility, and relative levels of implied volatility as measured by various points in the skew.

It takes professional expertise and robust technology in order to identify which options (left or right tail) to own, how much to own, when to sell them, how much to roll, what to roll them into, etc. The constant action of re-hedging, re-balancing, and re-optimizing is integral in managing an options portfolio.

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