What are Volatility Risk Premium Strategies?

Volatility Risk Premium ("VRP") strategies — also known as defensive equity strategies — are relatively new to the institutional landscape, but have grown in popularity given the current backdrop of historically high equity valuations, low interest rates, and frustration over hedge fund fees and performance. This newsletter summarizes how these strategies operate and outlines key risk and return metrics that will help investors decide if a VRP strategy is appropriate for their portfolios.

THE THEORY BEHIND VRP STRATEGIES

VRP strategies are not dependent on underlying security fundamentals — such as earnings, dividends, interest rates, and/or spreads — to generate a source of income. Rather, they are based on systematically selling put and call options on equity indices, which effectively protect equity portfolios from market downturns. The VRP strategies are essentially selling insurance to investors who wish to hedge their long equity exposure. The insurance provider (the VRP product) and the insured (the equity investor looking to protect his/her portfolio — the “insurance” buyer) mutually benefit from the transaction. The seller earns a profit by selling option contracts on the equity index plus interest on collateral and the buyer has protection in the event the equity index sells off. No leverage is used in such strategies and all options sold are fully collateralized with cash. Fundamentally, VRP product managers profit from the premium that investors pay to protect their portfolios from the adverse effects of equity market volatility — hence the name “volatility risk premium” strategies.

The main thesis behind these strategies is that equity index options have historically been overpriced. Exhibit 1 shows how the goal is to harvest excess option premiums. Option prices are based on implied volatility, which is the expected future volatility over the life of the contract term. Realized volatility is the actual volatility of the option over the contract life, and is consistently lower.
than the expected volatility. This difference creates the overpricing gap indicated in the exhibit, and is the premium collected by the VRP strategy (the insurance seller).

**Exhibit 1: Overpricing Gap**

To put some data behind this theory, Exhibit 2 looks at the implied volatility minus the realized volatility of the S&P 500 Index over the last 20 years; implied volatility is based off the Chicago Board of Options Exchange (“CBOE”) Volatility Index (“VIX”). The VIX measures market expectations of near-term volatility conveyed by S&P 500 stock index options prices. VIX estimates the expected volatility of the S&P 500 by averaging the weighted prices of 30-day SPX put and calls over a wide range of strike prices. An implied volatility higher than realized volatility means that selling an option was a profitable transaction. The chart examines the average annual implied vs. realized volatility of the S&P 500 over the last 20 years. 19 of those years saw implied volatility greater than realized volatility, resulting in positive premium collection.

**Exhibit 2: Implied Volatility Consistently Exceeds Realized Volatility**

Source: Bloomberg and CBOE
RISK AND RETURN CHARACTERISTICS

The CBOE created indices going back to the mid-1990s that track the performance of VRP strategies. The CBOE S&P 500 PutWrite (“PUT”) Index tracks the performance of selling fully collateralized SPX options. The strategy sells a sequence of one-month at-the-money S&P 500 Index put options and invests the premiums in one- and three-month Treasury bills. The CBOE COMBO (“COMBO”) Index tracks the performance of selling an equal mix of fully collateralized S&P 500 put and call options. It sells a monthly at-the-money SPX option and a monthly 2% out-of-the-money (“OTM”) SPX call option. The short SPX put position is collateralized by a money market account invested in one-month Treasury bills and the 2% out-of-the-money SPX call is collateralized by the long SPX index positions.

Exhibit 3 illustrates the performance benefits of including options strategies vs. traditionally used indices. Both the PUT and COMBO indices reduce the risk profile of equities (as measured by the S&P 500), while boosting the returns offered by hedge funds (as measured by the equity hedge index). Investors should note that VRP strategies will provide better risk adjusted returns over a full market cycle, but performance can vary greatly compared to equity markets, depending on the prevailing market environment.

VRP PRODUCTS

There is a wide variety of available products from which investors can choose, but it is important to understand the distinctions behind each VRP fund. We recommend that clients focus on systematic option strategies (as opposed to discretionary) that are based off the CBOE Combo and PutWrite indices. Such strategies are designed to replicate these indices but instead of selling options once a month, they sell options on a weekly basis, in an effort to outperform their respective indices. These products are institutional quality and can be accessed through mutual funds or commingled offerings.
In particular, there are two primary strategies that we recommend to clients. The short strangle strategy — shown in Exhibit 4 — is the systematic selling of out-of-the-money put and call options on the S&P 500 Index. The cash collateral is invested 50% in U.S. Treasuries and 50% in the S&P 500 Index. Options are rolled on a weekly basis to improve diversification across strikes, expiration dates and volatility levels, which reduces the impact of price swings. It does not use leverage and is 100% collateralized. This strategy will sell further OTM options when implied volatility is higher. The goal of this product is to outperform the S&P 500 over a full market cycle.

**Exhibit 4: Short Strangle Strategy**

| ~50% of portfolio in T-bills | + | ~50% of portfolio in S&P 500 Index | + | Put and call option premium ~0.5% | = | Total Return |

The second strategy is built around selling at-the-money put options on the S&P 500, and is designed to outperform the CBOE PutWrite Index with lower volatility. This strategy focuses strictly on selling put options and assumes that investors will pay a premium for downside protection. Demand is higher for put protection — due to the long equity exposure most clients have — and allows the strategy to collect more premiums as well as creating a higher potential return over a full market cycle. This strategy is shown in Exhibit 5.

**Exhibit 5: Selling at-the-money Put Options**

| T-bills | + | Put option premium ~1.5% | − | Equity drawdown | = | Total Return |
Exhibit 6 shows the performance of the two strategies, with Manager 1 representing the short strangle and Manager 2 representing the PutWrite strategy.

<table>
<thead>
<tr>
<th></th>
<th>2011 (Sep-Dec)</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>YTD (3/31/18)</th>
<th>5yr Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager 1</td>
<td>6.2%</td>
<td>9.1%</td>
<td>16.0%</td>
<td>8.4%</td>
<td>3.9%</td>
<td>8.2%</td>
<td>11.7%</td>
<td>-2.0%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Manager 2</td>
<td>-</td>
<td>13.8%</td>
<td>12.3%</td>
<td>7.8%</td>
<td>6.9%</td>
<td>8.5%</td>
<td>10.7%</td>
<td>-4.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>CBOE PutWrite</td>
<td>6.2%</td>
<td>8.1%</td>
<td>12.3%</td>
<td>6.4%</td>
<td>6.4%</td>
<td>7.8%</td>
<td>10.8%</td>
<td>-2.6%</td>
<td>5.8%</td>
</tr>
<tr>
<td>CBOE COMBO</td>
<td>11.3%</td>
<td>7.5%</td>
<td>16.5%</td>
<td>5.5%</td>
<td>4.3%</td>
<td>7.9%</td>
<td>15.3%</td>
<td>-2.1%</td>
<td>6.4%</td>
</tr>
<tr>
<td>HFRI Equity Hedge</td>
<td>-4.3%</td>
<td>7.4%</td>
<td>14.3%</td>
<td>1.8%</td>
<td>-1.0%</td>
<td>5.5%</td>
<td>13.5%</td>
<td>0.7%</td>
<td>5.3%</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>4.0%</td>
<td>16.0%</td>
<td>32.4%</td>
<td>13.7%</td>
<td>1.4%</td>
<td>12.0%</td>
<td>21.8%</td>
<td>-0.8%</td>
<td>9.9%</td>
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</tbody>
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Given that VRP strategies do not feature 100% long exposure to equity markets, it is not surprising that they have underperformed the S&P 500 index during this historic bull market. However, their volatility is approximately half of the broad market — so the risk is significantly lower — which is a primary motivation for many investors when moving assets out of equities and into defensive equity strategies. Furthermore, they have generally outperformed hedged equity funds, which has contributed to the movement of assets into defensive equity products.

**CONCLUSION**

Volatility Risk Premium products have evolved into institutional quality products that are a compelling addition to client portfolios. As investors have grown tired of paying hedge fund fees for products that have not lived up to their investment thesis, lower fee VRP strategies have become more attractive. Furthermore, these systematic strategies offer a compelling opportunity to diversify institutional portfolios and improve their risk/return profile, especially in light of expensive equity markets and growing volatility. Many institutional investors have already added an allocation to these strategies in their portfolios, and we expect this trend to continue in the coming years.

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1 S&P 500 index options trade under the symbol SPX and have an underlying value that is equal to the full value of the level of the S&P 500 index
2 Put or call option strike price is identical to the price of the underlying security
3 Term used to describe a call or put option that is higher or lower than the market price of the underlying asset
4 Systematic trading is a rules-based investment process that makes trading decisions in a methodical way
5 Discretionary trading is decision-based trading, with the trader deciding which trades to make based on the market
6 Short strangle option strategy requires the investor to simultaneously sell a call and a put on the same underlying security
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