## Debunking Five Myths about Cash-Secured PutWrite Strategies

A Cash-Secured PutWrite strategy sells a put option and fully collateralizes the option with cash or cash equivalents, i.e. the collateral balance is equal to the maximum possible loss of the short put at expiration. Historically, Cash-Secured PutWrite strategies such as the Cboe S&P 500 PutWrite (PUT) Index have provided investors with equity-like returns with 2/3 of the volatility. Sometimes dubbed an "exotic" strategy, Cash-Secured PutWrite is often misunderstood and mischaracterized. In this article, we review five claims about Cash-Secured PutWrite strategies.

Claim #1: Cash-Secured PutWrite can blow up in a market selloff.

In short, buying a put option is tantamount to buying insurance against market downturns. Selling puts, or selling insurance, is often (mis)described as an "excessive risk taking" strategy and invokes fear in some investors. In fact, selling puts can be risky or conservative, depending on the implementation.

If a put option is sold uncovered, i.e. not backed by cash, then the option seller may receive an outsized margin call in a stressed market, or even be forced to liquidate. However, a cash-secured put, i.e. selling puts and simultaneously setting aside sufficient cash to cover the maximum possible loss, is a conservative strategy. By construction, a cash-secured put is the same as a covered call position, which will not blow up in a market selloff. Exhibit 1 shows the returns of the S&P 500 Total Return Index and the Cboe PUT Index during 14 market corrections[1] since 1986. In each of these scenarios, the Cboe PUT Index did not blow up. In fact, the Cboe PUT Index remained solvent and outperformed the broad equity market. Further, **the Cboe PUT Index reduced drawdowns by more than 40%!**

Exhibit 1: S&P 500 Total Returns and PUT Total Returns during Market Corrections
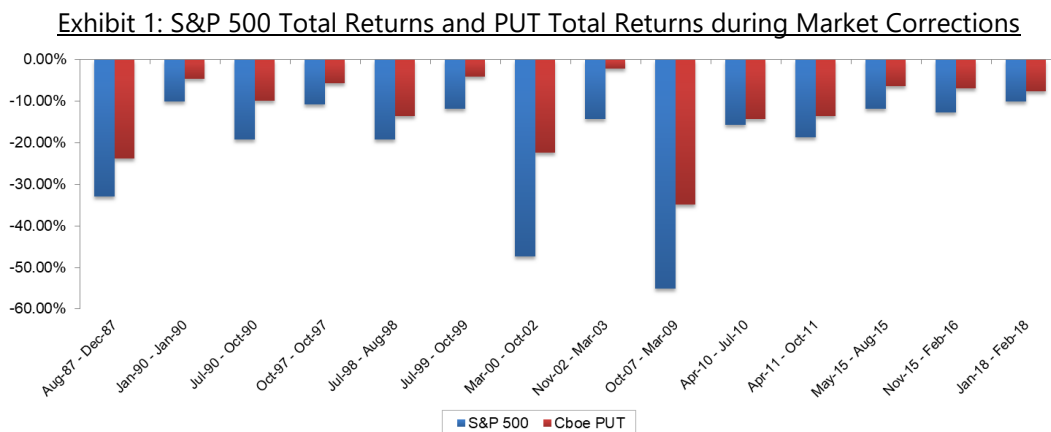
Source: Bloomberg and RJA analysis.

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[1] A market correction is defined as a 10% or more decline in the S&P 500.

Claim #2A: Cash-Secured PutWrite gives investors capped upside.

Let's consider the Cboe PUT Index. Over a one-month expiration cycle, the maximum profit from selling a one-month put option is the option premium received upfront. When the next expiration cycle starts, a new one-month put option is sold at the new at-the-money level. **By resetting the strike price of the put option on a monthly basis, the Cboe PUT Index has collected an average option premium of 2% per month**, allowing investors to achieve an annualized maximum upside of nearly 28%[2]. This upfront collection of premiums also provides a buffer against those months when the S&P 500 exhibited a negative return.

Exhibit 2A summarizes the rolling 12-month performance statistics of the S&P 500 Total Returns and the Cboe PUT. Over its 32-year history, 87% of the 12-month returns of the Cboe PUT Index are positive, versus 81% for the S&P 500. On the upside, the Cboe PUT Index captures 78% of the returns of the S&P 500 with 68% of the volatility; on the downside, the Cboe PUT Index reduces the average negative return of -14.87% for the S&P 500 to -10.31% along with a lower volatility. By providing protection against market downturns while maintaining exposure to a large portion of the upside potential, the Cboe PUT Index achieves a more efficient risk-return profile, as evidenced by both the Sharpe Ratio and the Gain Loss Ratio[3].

Exhibit 2A: S&P 500 Total Returns and PUT Performance Statistics

		S&P 500	Cboe PUT
Positive Return Cases	# of Observations	301	323
	Average Return	17.63%	13.77%
	Standard Deviation	10.26%	7.05%
Negative Return Cases	# of Observations	70	48
	Average Return	-14.87%	-10.31%
	Standard Deviation	10.83%	8.14%
Total	Sharpe Ratio	0.49	0.67
	Gain Loss Ratio	5.10	8.99

Source: Bloomberg and RJA analysis. June 1986 – April 2018.

Claim #2B: Cash-Secured PutWrite gives investors unlimited downside.

It is true that an uncovered short **call** position has **unlimited** downside as there is no telling how far the underlying price can go up. However, a short **put** position has a **limited** loss. The maximum downside loss is limited to the put option's chosen strike price since the underlying price can only go to zero but not below. By setting aside cash to fully collateralize the short put

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[2] The average monthly option premium is based on daily option pricing data from August 2000 to April 2018. The annualized maximum upside is calculated by annualizing the average monthly option premiums, compounded monthly.
[3] The Gain Loss Ratio is measured as the ratio of the average gain in gain periods to the average loss in loss periods.

option, **Cash-Secured PutWrite does not employ leverage**, i.e. investors cannot lose more than the amount of money that they have invested.

Exhibit 2B is an illustration of the profit profile of a Cash-Secured PutWrite strategy. As shown in the chart, even in the worst case scenario where the S&P 500 falls to zero, the value of the Cash-Secured PutWrite strategy does not fall below zero. Furthermore, as illustrated in Exhibit 1, the Cboe PUT Index outperformed the S&P 500 Total Return Index in all 14 market corrections since the strategy's inception in 1986. To summarize, Cash-Secured PutWrite strategies not only provides investors with a limited downside but also offers substantial protection during stressed markets.

Exhibit 2B: Illustration of Cash-Secured PutWrite Profit Profile
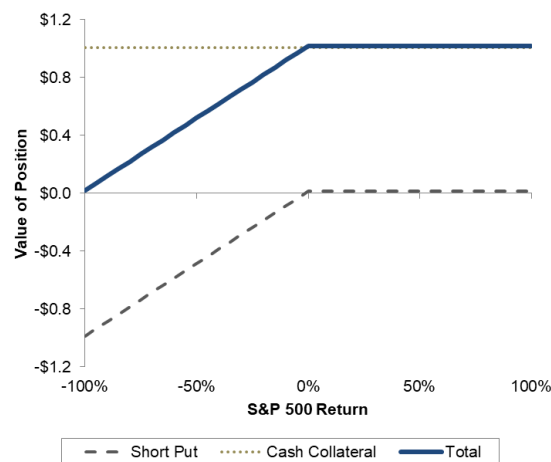
For illustration purpose only. The chart assumes an initial investment of $1.

Claim #3: Cash-Secured PutWrite only works in high (or low) vol environments.

Some investors claim that Cash-Secured PutWrite strategies only produce alpha in high vol environments because option premiums are high. Other investors claim that they only work in low vol environments because realized volatility is low and the option is less likely to expire with a significant payout. Each of these claims only captures part of what is going on. Cash-Secured PutWrite strategies are designed to capture the Volatility Risk Premium (VRP), i.e. the spread between the one-month at-the-money implied volatility and subsequent realized volatility. As a result, **Cash-Secured PutWrite strategies produce alpha in both high- and low-vol environments**, as long as the VRP is positive.

To further illustrate this point, we partition the VIX history into five equal-sized buckets. Exhibit 3 shows the corresponding average VRP in each bucket. Across all five quintiles, the average VRP

is positive between 2.5% and 5% on an annualized basis. Hence, Cash-Secured PutWrite is expected to generate alpha in both high and low vol environments.

Exhibit 3: Ex-Post VRP by VIX Levels
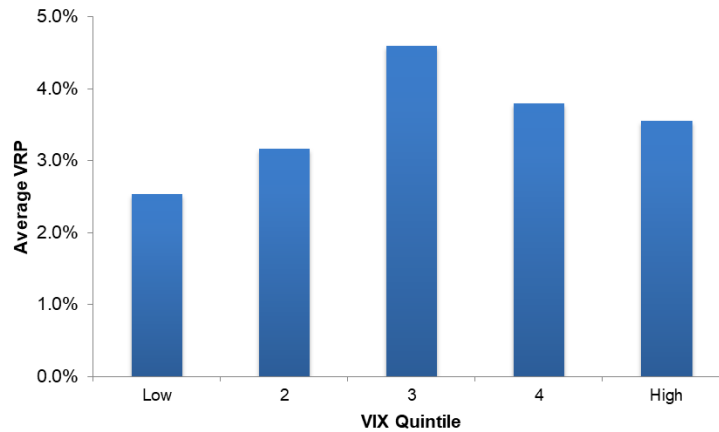
Source: Bloomberg and RJA analysis. January 1990 (inception of VIX) – April 2018. Average VRP is calculated as the difference between the square root of the average implied variance (VIX squared) and the square root of the average realized variance.

Claim #4: The Volatility Risk Premium will disappear if realized volatility is higher than implied volatility.

The Volatility Risk Premium (VRP) is usually characterized by the observation that one-month at-the-money implied volatility tends to exceed subsequent realized volatility. As its name suggests, the VRP is driven by risks not captured in typical models, such as Black-Scholes. In particular, the VRP compensates option sellers for bearing downside risk, especially tail and jump risk, in a market with a negatively-skewed, fat-tailed return distribution. Option buyers are willing to pay a premium for insurance against these same risks because they are averse to losses. Based on these reasons, i.e. the risk-averse nature of investors, **the VRP will persist in the future as long as there is risk in the market.**

That being said, the VRP is not expected to be positive in every single period. Exhibit 4 shows that historically realized volatility has been temporarily higher than implied volatility during market turbulence. While the VRP turned negative briefly during these periods, the corresponding elevated volatility levels indicate that option premiums collected in subsequent periods were higher. Over the long term, the VRP averaged 4.44% on an annualized basis.

Exhibit 4: Volatility Risk Premium by Month
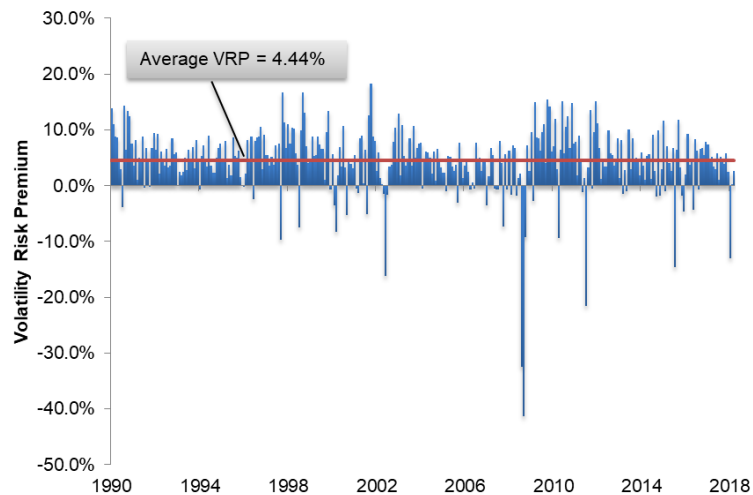
Source: Bloomberg and RJA analysis. January 1990 (inception of VIX) – April 2018.

## Claim #5: Cash-Secured PutWrite gives investors a negatively skewed return distribution.

It is true. Historically, the Cboe PUT Index displayed a negative skew of -2.13. Nevertheless, the negative skew may not be a cause for concern because (1) the VRP compensates investors for bearing downside risk, and (2) a negatively skewed return distribution does not necessarily mean that you are exposed to large or frequent drawdowns.

In Claim #3 above, we explained why the VRP will continue to persist. Below we focus on why a negative skew does not automatically mean substantial downside exposure.

From a statistical perspective, skewness describes the extent of asymmetry in a probability distribution. A distribution with a negative skew has a longer tail on the left hand side. Given two return distributions with the same mean and volatility, a more negative skew indicates a higher exposure to negative returns. However, the Cboe PUT Index has different mean/volatility characteristics than the S&P 500. In particular, the Cboe PUT Index has generated approximately the same return as the S&P 500 Total Return Index with only two thirds of the volatility since its inception.

Exhibit 5 compares the monthly return distribution of the Cboe PUT Index and the S&P 500 Total Return Index from June 1986 to April 2018. **The Cboe PUT Index, despite being more negatively skewed, displays less substantial downside than the S&P 500 Total Returns**. The S&P 500 experienced losses in 132 months, as compared to 91 months for the Cboe PUT Index.

Exhibit 5: Monthly Return Distribution of the Cboe PUT and the S&P 500 Total Returns
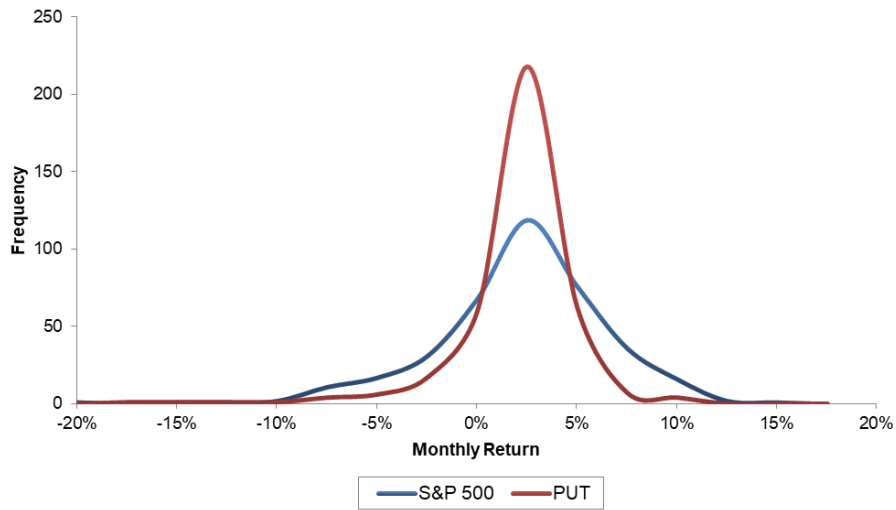
Source: Bloomberg and RJA analysis. June 1986 – April 2018.

More questions?

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