Allspring

Options-Based Downside Protection

+ Hedging equity downside risk by buying protective puts can be expensive.
+ Simultaneously selling options to offset the cost of protection in a "put spread collar" can be an effective strategy and is increasing in popularity.
+ A "naïve" put spread collar strategy, using matched expiry and a rigid approach to zero net premium, leaves room for improvement.
+ We believe our approach to implementing a put spread collar benefits from an informed understanding of option market dynamics.

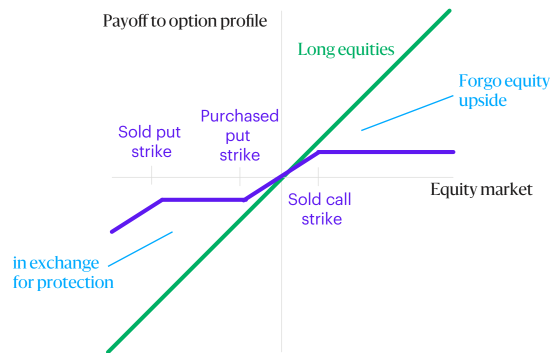
Background

Many investors are considering when and how much equity risk to take off the table. A particular challenge in the current environment stems from the low interest rate regime—a reallocation into fixed income offers the prospect of low or possibly negative returns and reduced effectiveness as a hedge to equities. We believe that holding an equity allocation with an options overlay seeking downside protection may deliver the desired "smoother ride" while largely maintaining return expectations. In this way, an investor may improve confidence in the face of anticipated volatility through reshaping a portfolio's expected return distribution with a hedging program that is both effective and cost-efficient.

The put spread collar

One of the most common options-based approaches to cost-effectively hedge equity risk is the put spread collar. This strategy is the core of many "buffer" and "hedged equity" products offered in fund form today. In this options profile, protective puts are overlaid to long equity, paid for by selling deeper out-of-the-money puts and by selling out-of-the-money upside calls.

FIGURE 1: PUT SPREAD COLLAR PAYOFF DIAGRAM



Source: Allspring. For illustrative purposes only. The X axis (horizontal) represents the equity market return. The Y axis (vertical) represents the payoff profile of a generic put spread collar.

Commonly, the put spread collar is structured in such a way that all three legs of the position are set to the same date of expiry. The option strikes often are specified with a goal of neutralizing the net premium flow (a so-called "zero-cost" approach or, more accurately, a zero-premium approach). Said another way, the puts are generally specified in advance and the call strike is set at a level that will exactly offset the net cost of the put spread.

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In order to examine the "naïve" put spread collar, we can rely on the CBOE suite of strategy benchmark indexes and look to the CBOE S&P 500 Zero-Cost Put Spread Collar Index (ticker CLLZ). This index buys and sells one-month-to-expiry options, rolling monthly, buying a 2.5% out-of-the-money (OTM) protective put, selling a 5% OTM put, and selling an OTM call at a strike that "pays for" the put spread.

FIGURE 2: ZERO-COST PUT SPREAD COLLAR INDEX

	CLLZ	S&P 500
Total return	7.65%	10.83%
Standard deviation	11.7%	15.2%
Sharpe ratio	0.39	0.51
Max drawdown	-43.02%	-50.91%

Source: Bloomberg. Data presented for the period spanning July 1986 through September 2021.
Past performance is not a reliable indicator of future results.

CLLZ provides the desired expected beta and risk reduction and explicit protection in a month when the market is down between 2.5% and 5%, but its returns over time trail the underlying S&P 500 Index alone, both on a total return basis and when adjusted for the lower beta. Thus, we can see that while this approach targets zero net premium, it is far from zero cost. **We believe there is a better way.**

Our approach to seeking protection

The core of our strategy[1] is the purchase of longer-dated protective puts. We buy protection against downside risk through the purchase of equity index put options of 12-month tenor approximately 10% OTM. In purchasing these options, we hedge the equity exposure, seeking protection against losses greater than the 10% OTM strike over a 12-month time horizon. The 10% level can be thought of as the annual equivalent to the CLLZ 2.5% monthly level, as the option market will tend to assign a similar probability to seeing the benefit of this protection.

In buying one-year 10% OTM protection each month at 1/12 of underlying equity value, the strategy has an "always on" protection feature, which naturally recalibrates to the rising and falling of the equity market over time. As a result, the effective "hedge level" or average strike of the portfolio of 12 options may vary over time around the 10% target.

Our approach to subsidizing the cost of protection

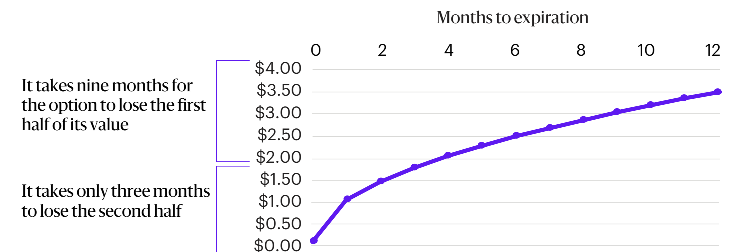
As most investors are aware, the outright purchase of longer-dated equity index options can be an expensive proposition. In fact, 12-month 10% OTM puts historically have been priced in a range of 3% to 10% of the index level, effectively offsetting any anticipated equity return premium from the underlying portfolio.

Our approach to the put spread collar favors short-dated call- and put-selling in order to subsidize the cost of buying these longer-dated puts. In general, selling one-month OTM calls and puts to finance the purchase of 12-month puts can offer attractive risk-adjusted return profiles and, in certain cases, has demonstrated total returns in excess of equity alone.
This combined approach is a variation on what is known in options circles as a "calendar put spread collar."

Why we think our approach is better: 1) time decay

The Calendar Put Spread Collar strategy takes advantage of the nature of option price "decay" over time, collecting return as the shorter-dated sold options decline in price more rapidly than the longer-dated purchased puts. This approach, however, is not without trade-offs—by virtue of selling shorter-dated calls, the strategy will underperform the equity market when the market rises rapidly, as the call-selling will effectively "cap" the potential returns over a one-month time horizon. By virtue of selling shorter-dated puts, there may be some offset to our protection leg if there is a relatively swift market sell-off.

FIGURE 3: THE NATURE OF OPTION TIME VALUE DECAY



Source: Allspring. For illustrative purposes only.

Why we think our approach is better: 2) term structure of implied volatility

One challenge when implementing a hedging program is the increased cost of protection in difficult market environments. In fact, we see that in response to events like the global financial crisis and the COVID-19 pandemic, the premium for protective puts increased by two-fold or more.

A characteristic of the options market that makes the Calendar Put Spread Collar particularly attractive is the nature of the volatility market reaction to major market events. In general, in a negative market event, the options market will see a dramatic spike in implied volatility on the short end of the term structure of volatility and a more muted response at the long end. We see a real-life example of this in the 2020 COVID-19 crisis, as the change in the shape of the term structure of S&P 500 at-the-money implied volatility is dramatic from January to March 2020.

1. This is not a live strategy at Allspring, it is hypothetical for illustrative purposes only to demonstrate our investment capabilities. It is not investment advice or a recommendation to trade.

FIGURE 4: iVOL REACTION TO AN EVENT—COVID-19 PANDEMIC

Source: Bloomberg. Shows implied volatility by time to expiry as of mid-January 2020 and mid-March 2020.

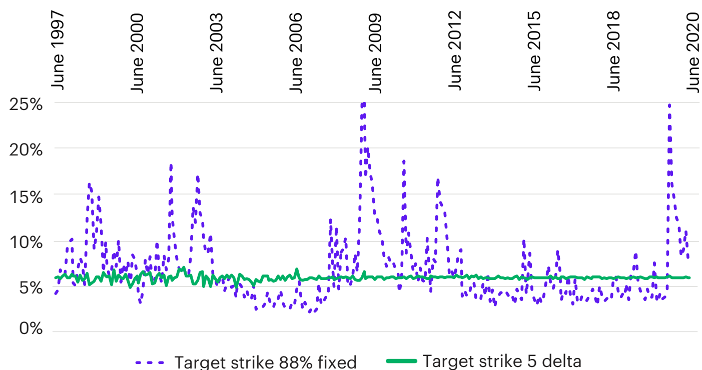
The implication of this relative implied volatility reaction to such an event is that our financing legs can become even more valuable than our protective leg as the market responds to new risks on the horizon. The net premium result is a relatively smooth ride over time as market conditions change, with this approach to the strategy providing an effective antidote to the high cost of protection environments.

Why we think our approach is better: 3) delta-based strike selection

Two aspects of the fixed-strike put spread collar that pose some cause for concern are the nature of a fixed-strike sold put in different volatility environments and the nature of an uncertain call strike, determined solely through premium neutrality of the entire structure.

Our approach uses delta-based strike targeting for sold puts and calls, allowing the profile to adjust naturally as implied volatility rises (strikes move further OTM) or falls (strikes move closer to at-the-money). A delta-based approach ensures that the probability of realizing a loss on either the sold put or sold call stays relatively constant through time, with the put-side example shown below.

FIGURE 5: PROBABILITY OF A ONE-MONTH 5D PUT EXPIRING IN-THE-MONEY

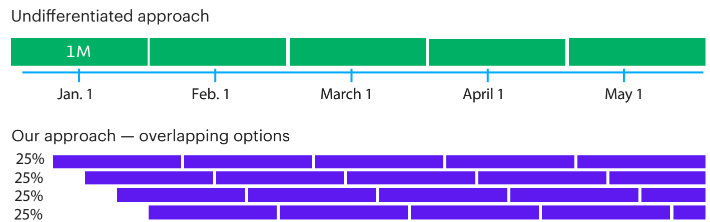


Source: Allspring. Data presented for the period spanning June 1997 through December 2020.

Why we think our approach is better: 4) overlapping expiries

A put spread collar that picks a single expiry at launch and then rolls this position periodically is subject to the randomness of "path dependency" of markets. For example, a quarterly time horizon profile rolled quarterly can be problematic if the path of market quarters is such that market returns line up with the option strikes specified. For example, if 5% OTM quarterly puts are purchased and 3% OTM quarterly calls are sold, a year in which the market is down 5% in each of the first three quarters and up 15% in the fourth quarter would be quite painful on a relative basis. To mitigate path dependency, our approach systematically overlaps positions, such that longer-dated puts are purchased each month and shorter-dated options are sold each week. Varying start and end dates in this way reduces the risk that short-term strategy returns can be overly affected (negatively or positively) by the path of the market.

FIGURE 6: OVERLAPPING EXPIRIES DIAGRAM



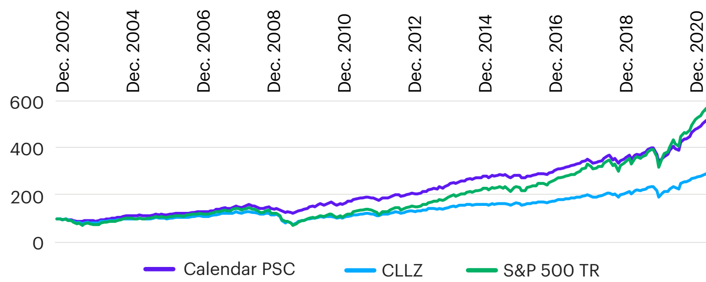
Source: Allspring. For illustrative purposes only.

The results

We now examine the results of a systematic backtest of our preferred variation on the Calendar Put Spread Collar as an overlay to the S&P 500 Index since January 2002. This variation incorporates the characteristics mentioned above: time decay, term structure of volatility, delta-based strike selection, and overlapping expiries. The specific components of the overlay to a passive S&P 500 Index allocation are:

- Each month, 12-month 10% OTM puts are purchased at 1/12 notional and held to expiry.
- Each week, four-week 15-delta calls are sold at 25% notional (total of 100% notional at all times) and held to expiry.
- Each week, four-week 5-delta puts are sold at 12.5% notional (total of 50% notional at all times) and held to expiry.

FIGURE 7: GROWTH OF $100

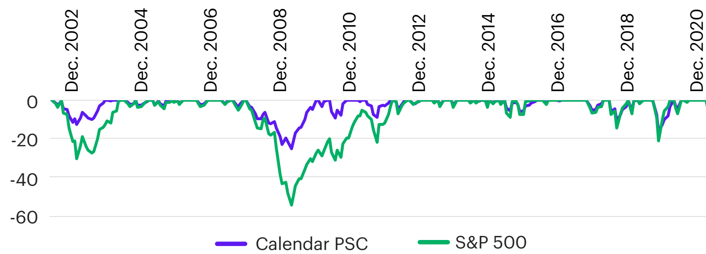


	RETURN	STANDARD DEVIATION	SHARPE	BETA	BETA-ADJUSTED EXCESS RETURN
Calendar PSC	8.61%	8.9%	0.83	0.57	2.91%
S&P 500	9.07%	14.6%	0.54	1.00	–
CLLZ	5.50%	11.4%	0.38	0.74	-1.55%

Sources: Allspring and Bloomberg. Data presented for the period spanning December 2001 through September 2021. **Past performance is not a reliable indicator of future results.**

We can see that while the Calendar Put Spread Collar shows a similar beta and standard deviation profile to that of the zero-cost one-month put spread collar, it shows a return profile much closer to that of equities alone.

FIGURE 8: DRAWDOWN CHART



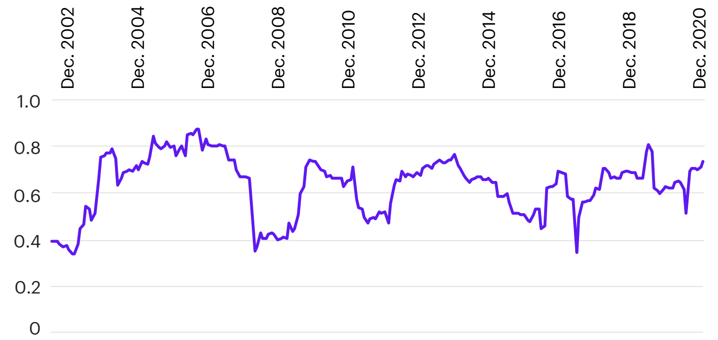
Sources: Allspring and Bloomberg. Data presented for the period spanning December 2001 through September 2021. **Past performance is not a reliable indicator of future results.**

Role in strategic asset allocation

There are at least two interesting applications of this strategy in a strategic asset allocation exercise: 1) risk-reduced equity and 2) "60/40" replacement (60% equity/40% bond) without explicit rate sensitivity.

Risk-reduced equity. Our approach has demonstrated reliably lower realized risk than equities alone—below, we see that the rolling beta profile to equities is fairly consistent around the long-term 0.57, notably dipping in the bear markets of 2002 and the global financial crisis:

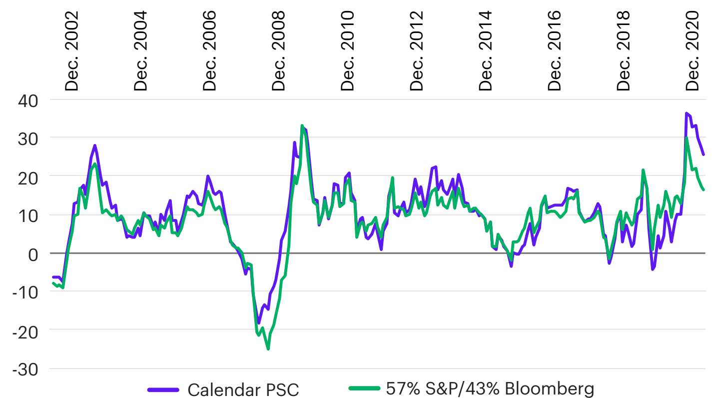
FIGURE 9: 12M ROLLING BETA



Source: Allspring. Data presented for the period spanning December 2001 through September 2021. **Past performance is not a reliable indicator of future results.**

"60/40" replacement. Looking at a mix of equities (S&P 500 Index) and fixed income (Bloomberg U.S. Aggregate Bond Index) at a similar beta profile shows a high degree of similarity to our Calendar Put Spread Collar, suggesting that the strategy could be an effective replacement for a "60/40" allocation, without the explicit duration risk inherent in the bond portion of the allocation. *Our strategy shows an added benefit historically of outperforming this mix of equities and bonds, even in a period when rates have steadily declined.*

FIGURE 10: 12M ROLLING RETURNS VS. BETA-EQUIVALENT 60/40 (AGG)



Sources: Allspring and Bloomberg. Data presented for the period spanning December 2001 through September 2021. **Past performance is not a reliable indicator of future results.**

Enhanced systematic implementation

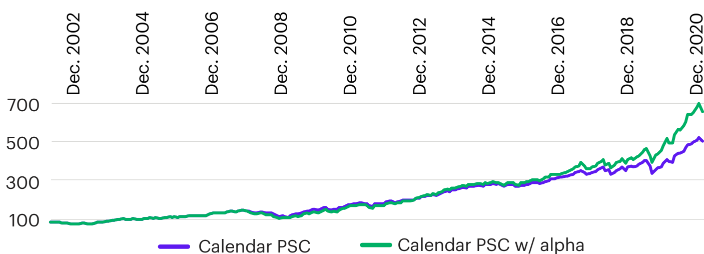
Our options team has demonstrated a long track record of outperformance to systematic options strategies using our volatility forecast model and expected return model. We believe that applying these tools to the above-profiled systematic Calendar Put Spread Collar would supplement return generation of the strategy. Given that the purely systematic strategy has historically exhibited a total return just shy of equities alone, the additional value-add from active management could enable an "enhanced systematic" version of the strategy that might offer total returns in excess of equities while maintaining the volatility and beta reduction profile that are at the strategy's philosophical core.

Conclusion

The Calendar Put Spread Collar profile may be an interesting solution for investors seeking ways to maintain equity-like return potential in this challenging environment of stretched equity valuations and few asset classes in which to hide. This strategy seeks to provide material risk mitigation without giving up significant expected return potential. Given the growth in options market liquidity over recent years, the approach can be effectively implemented as an overlay to almost any diversified equity portfolio, using a variety of options on equity indexes, on equity futures, or on exchange-traded funds. The strategy is offered in an overlay format that may be comfortable for both passive and active equity investors and can be an effective packaged solution when combined with our offerings of systematic or fundamental value-added equity strategies.

Appendix—enhanced systematic strategy profile

FIGURE 11: GROWTH OF $100—CALENDAR PUT SPREAD COLLAR WITH ALPHA



	RETURN	STANDARD DEVIATION	SHARPE	BETA	BETA-ADJUSTED EXCESS RETURN
Calendar Put Spread Collar alpha	10.02%	10.0%	0.88	0.61	4.02%
Calendar Put Spread Collar	8.61%	8.9%	0.83	0.57	2.91%
S&P 500	9.07%	14.6%	0.54	1.00	–

Source: Allspring. Data presented for the period spanning December 2001 through September 2021.

Glossary

At-the-money (ATM). An option with a strike more or less at the current spot level of the underlying.

Call option. A contract that gives the holder the right, but not the obligation, to buy the underlying at the strike price.

Collar. An options strategy that sells upside calls to help fund the purchase of protective puts.

Delta. A measure of an option's price sensitivity in response to a change in price of the underlying. Choosing option strikes based on delta creates more sensitivity to market conditions than choosing based on moneyness. Delta has the secondary characteristic of offering a useful approximation for the likelihood that a given option will finish in-the-money or that spot will move past the strike price.

Moneyness. A measure of option strike in percentage of current spot of underlying. For example, if the underlying is trading at $1,000, an option with a strike price of $900 is said to have 90% moneyness (or is said to be 10% out-of-the-money in the case of a put option).

Out-of-the-money (OTM). An option with a strike at a level away from the current spot level of the underlying.

Premium. The amount the option contract buyer pays for the right to buy or sell the underlying at a certain level. The option seller receives this amount as compensation for the risk that the level of the underlying will exceed the strike, at expiry of the option.

Put option. A contract that gives the holder the right, but not the obligation, to sell the underlying at the strike price.

Strike. The predetermined level at which the option contract buyer may purchase (for a call) or sell (for a put) the underlying.

Theta (time) decay. The rate at which a given option declines in price, all other variables held equal.

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