Product Primer

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INDEX PUT WRITING:

Taking the Edge Off Equity Risk

With increasing potential for unsettled markets, we believe investors should consider an allocation to put writing strategies, which have the potential to generate equity-like returns while reducing portfolio volatility.

Current Investor Concerns

Market Decline

- The advancing age of the bull market is contributing to worries that disappointments in growth or earnings could lead to broad market declines, extended weakness or prolonged stagnation in equity markets.
- Although few would compare the current situation with the market run-up to the 2008 financial crisis, many investors would like to mitigate the impact a similar occurrence would have on their portfolios.

Trade Tensions and Slower Growth

- Trade policies have become more antagonistic, with more forceful stances toward geopolitical/economic rivals and traditional allies alike.
- Ongoing tensions are chilling corporate activity and reinforcing a retreat from globalization.
- Sustained Federal Reserve tightening contributed to cooling economic expansion in the U.S., while China continues to struggle in managing its planned slowdown.

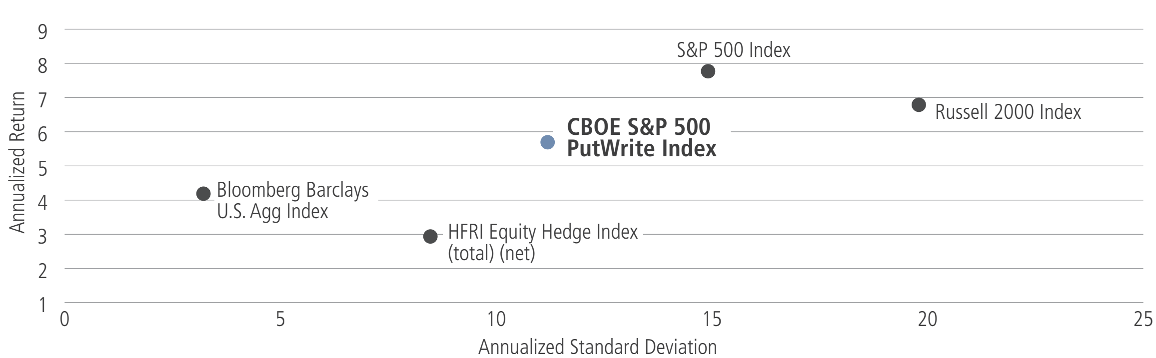
Increasing Volatility

- Markets have returned to a more normal level of price volatility.
- With less support from central banks and more dispersion in economic results, equity markets are reacting to multiple forces.
- Investors are seeking investment options that have the potential to provide attractive total and risk-adjusted returns and a smoother ride over time.

Index Put Writing: A Potential Portfolio Buffer

- Collateralized index put writing, a type of options strategy, has historically provided equity-like returns combined with fixed income-like volatility* (see chart below).
- As the equity market becomes more challenging, we believe that investors will come to appreciate its balance of risk and reward.

Index Annual Return vs. Risk (June 2007–March 2019)



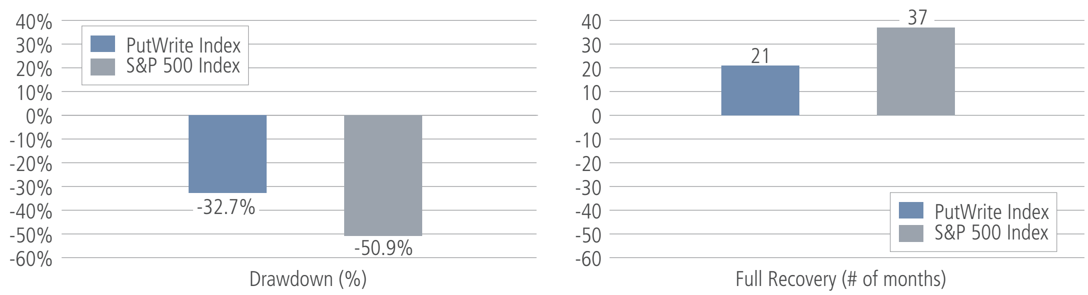
Source: CBOE and Bloomberg. Index data sourced from Bloomberg LP and is gross of fees unless stated otherwise. Selected time period reflects longest common history of indexes. Analysis period is limited by the CBOE S&P 500 PutWrite Index ("PutWrite Index") which incepted in June 2007. Unless otherwise indicated, returns shown reflect reinvestment of dividends and distributions. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principal. **Past performance is no guarantee of future results. *The composition, strategy, risks and fees and expenses, and accordingly the performance, of alternative products such as options strategies may differ significantly from other traditional asset class offerings, including equities and fixed income products. In up markets, options writing strategies typically will not participate in the full gain of the underlying index above the premium collected. Volatility is measured by standard deviation.**

About Options and Put Writing

- Option strategies have long been part of the investment landscape.
- They range from conservative techniques meant to hedge investment exposures or generate income, to more risky strategies that seek to capture return from movements in individual securities or broader markets.
- In our view, collateralized put writing is particularly appealing for risk-minded investors.[1]
  - Such strategies have historically generated equity-like returns with lower volatility.
  - In the down market of 2007–2009, index put writing provided a cushion relative to the S&P 500 Index (see chart below).
  - Built around standardized benchmarks, portfolios can be transparent, liquid, unleveraged and cost-effective.

Performance in Global Financial Crisis

PutWrite Index vs. S&P 500 Index (November 2007–February 2009)



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How Does Index Put Writing Work?

- The seller (or "writer") of a put gives the buyer the right to sell an index at a specified "strike" price on a specified date, receiving a payment or "premium" in exchange for setting the price and assuming risk.
- If the index's market price falls below the strike price, it is "in the money" and will be exercised at expiration.[2] If it remains above the strike price, it is "out of the money" and unless the price of the underlying index changes, it will eventually expire worthless.
- The risk for the index put writer is a decline in the level of the underlying index, since the writer will be forced to pay the difference between the strike price and the current market price (reduced by any premium received for selling the option) to the option holder.
- For the collateralized index put writer (who covers positions with short-term Treasury holdings or similar high-quality fixed income securities), the long-term goal is that the premiums received for selling index put options plus the income from the collateral portfolio generates an equity-like return with less volatility than the underlying equity index over the long term.*
- Index put writing strategies take such individual transactions and seek to systematize them for the benefit of investors.

[1] As evidenced by the historical return profile of the CBOE S&P 500 PutWrite Index.

[2] Note: Index options (including S&P 500 and Russell 2000) are so-called European options that cannot be exercised until the expiration date. In contrast, "American"-style options (such as single name options) can be exercised at any time before expiration.

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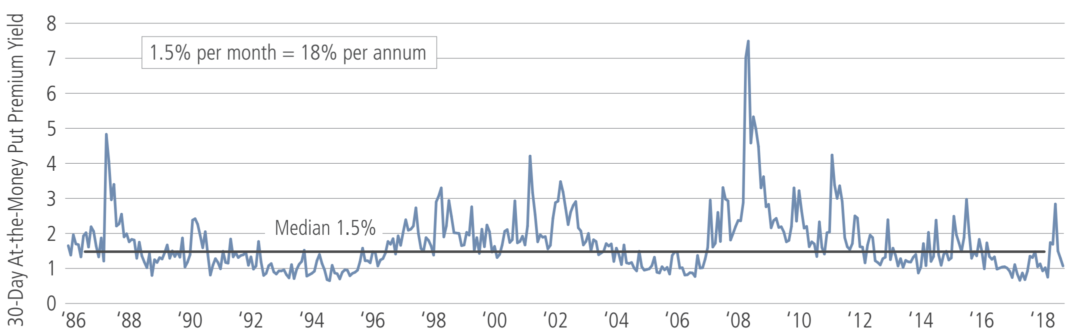
Index Put Writing at the Systematic Level

- The CBOE S&P 500 PutWrite Index tracks a hypothetical portfolio that every month sells a one-month "at the money" (where the market price is equal to the strike price) put option on the S&P 500 Index, fully collateralized by short-term Treasuries.
- As the prior option expires, the Index sells another one-month "at the money" S&P 500 Index put option. This process is repeated monthly.
- Simply stated, the Index collects option premiums 12 times per year, settles any options that expire in the money, and receives income from investments held as collateral.
- This approach is meant to capture and compound the collected option premiums and collateral income to generate an equity-like total return while mitigating equity and volatility risk.*

The average gross put option premium has been over 1.5% per month for the last 30 years, or roughly 18% per annum. The actual returns of the PutWrite Index would be lower because the premiums collected are partially offset by the cost incurred in cases where puts expire in the money and the contracts are exercised by their buyers.

Premiums, One Month at a Time

S&P 500 Index 30-Day At-the-Money Put Option Premiums



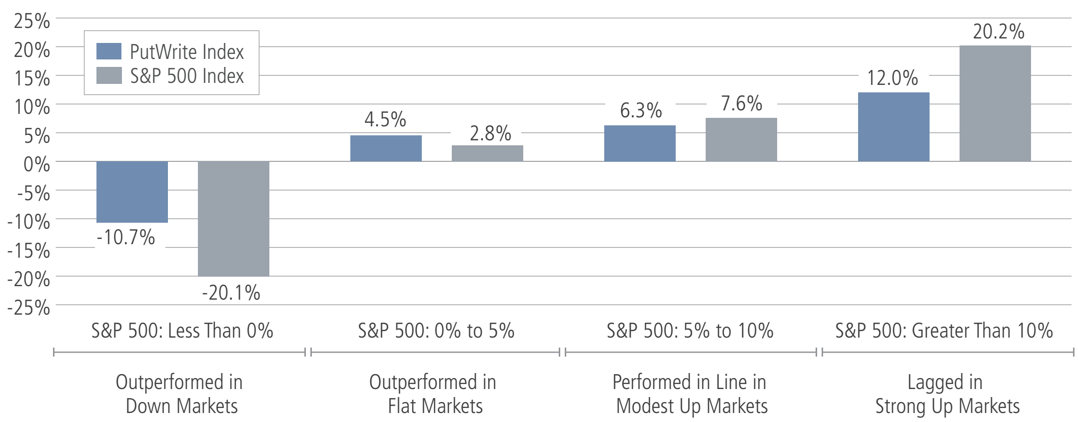
Source: CBOE and Bloomberg, July 1986 – March 2019. Put option premiums are based on the underlying option data used in the calculation of the CBOE S&P 500 PutWrite Index provided by the CBOE. Premium yields are calculated as the option premium divided by the option strike price. Index option implied volatility data sourced from Bloomberg. ***The composition, strategy, risks and fees and expenses, and accordingly the performance, of alternative products such as options strategies may differ significantly from other traditional asset class offerings, including equities and fixed income products. In up markets, options writing strategies typically will not participate in the full gain of the underlying index above the premium collected. Volatility is measured by standard deviation.**

Put Writing Return Characteristics

- Although the PutWrite Index has tended to trail the S&P 500 Index in strong markets, it has historically outperformed the S&P 500 Index in flat and down markets while still remaining in line with the S&P 500 Index in modest bull markets.
- The net result has been equity-like returns* with approximately two-thirds of the volatility (as measured by standard deviation) of the S&P 500 Index (see risk return chart on page 1).

Smoother Ride than the S&P 500

Average Returns under Different Market Environments (June 2007–March 2019)

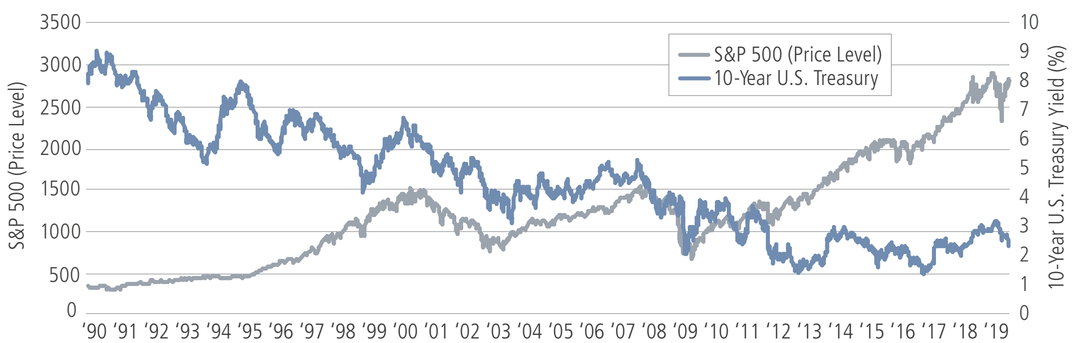


Source: CBOE and Bloomberg. Rolling 12-month periods are shown. Index data sourced from Bloomberg LP and is gross of fees unless stated otherwise. Selected time period reflects longest common history of indexes. Analysis period is limited by the PutWrite Index, which incepted in June 2007. Unless otherwise indicated, returns shown reflect reinvestment of dividends and distributions. Indexes are unmanaged and are not available for direct investment. Investing entails risks, including possible loss of principal. **Past performance is no guarantee of future results. *The composition, strategy, risks and fees and expenses, and accordingly the performance, of alternative products such as options strategies may differ significantly from other traditional asset class offerings, including equities and fixed income products. In up markets, options writing strategies typically will not participate in the full gain of the underlying index above the premium collected. Volatility is measured by standard deviation.**

What Role Can Index Put Writing Play in Portfolios?

- Some investors use put writing as an equity substitute, pursuing equity-like returns over the long term with less volatility than the broader equity markets.
- Others find the historically less-volatile return profile, particularly around periods of market turmoil, a suitable complement or replacement for certain pricier, less liquid alternative investment strategies that have typically been used to mitigate portfolio risk.
- Finally, although not a bond substitute, we believe that index put writing could be appealing to those investors who have been prompted by low bond yields to allocate away from fixed income but are wary of adding to holdings of traditional equities* given extended valuations in some areas of the market.

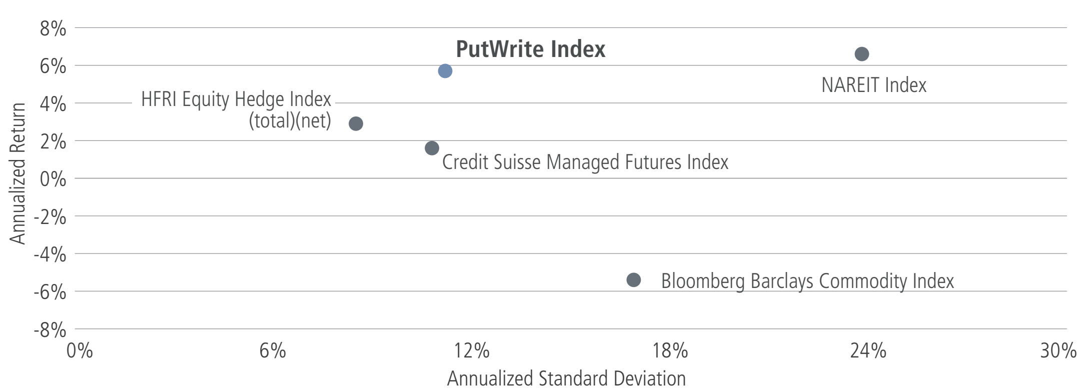
Current and Historical Averages: S&P 500 Index vs. 10-Year U.S. Treasury (Jan 1990–March 2019)



Period from January 1990–March 2019	Avg.	Current
10-Year U.S. Treasury Yield	4.56	2.86
S&P 500 Index (price/earnings)	24.00	18.04

Source: FactSet.

Index Annual Return vs. Risk (June 2007–March 2019)



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Benefits of Active Management in Index Put Writing

- In our view, the addition of collateralized index put writing strategies can benefit investor portfolios as they seek to smooth volatility and manage equity risk, especially at challenging times.
- Some passive vehicles are available that mimic the PutWrite Index, as are active strategies that seek to enhance the index in various ways. For example, active strategies may alter the collateral used, selling options with somewhat different maturities or seek to capitalize on better "rolling" of option contracts each month.
- We believe such active approaches can provide a more effective way to capture the attractive risk-adjusted return potential of index put writing.

Put Writing: Why Now?

- The equity market environment is becoming more unsettled, given shifts in the global political and economic landscape and reduced quantitative easing and central bank intervention.
- Index put writing can provide a way to seek equity exposure while mitigating risk; in times of market turbulence, put writers can benefit from the collection of premiums paid by put buyers who aim to mitigate short-term losses. During volatile markets, the premiums can increase as investors often 'overpay' for risk mitigation.
- A higher interest rate environment could benefit a put writing strategy as its short duration collateral investments have the potential to generate a greater yield.
- At a time when investors are looking for effective solutions to difficult portfolio challenges, we believe the return/risk history of index put writing offers a compelling choice.

Key Terms

Index Put Option: Writer/seller provides the holder/purchaser the right to sell an index at a specified ("strike") price within a specified time (at expiration) in exchange for a payment or "premium".

In the Money (Index Puts): The index is trading below the option strike price. At expiration, the put option remains valuable (strike minus current market price), meaning the put buyer will receive that difference from the seller.

Out of the Money (Index Puts): The index is trading above the option strike price. If circumstances do not change, the option will expire and the seller will keep the premium collected.

At the Money (Index Puts): The index is trading at the option strike price.

CBOE S&P 500 PutWrite Index: Measures the performance of a hypothetical portfolio that sells S&P 500 Index put options against collateralized cash reserves held in a money market account. The strategy is designed to sell a sequence of one-month, at-the-money, S&P 500 Index puts and invest cash at one- and three-month Treasury Bill rates.

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