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## **Description of the CBOE S&P 500 2% OTM BuyWrite Index (BXY**<sup>SM</sup>)

**Introduction.** The CBOE S&P 500 2% OTM BuyWrite Index (BXY<sup>SM"</sup>) is a benchmark index designed to track the performance of a hypothetical 2% out-of-the-money buywrite strategy on the S&P 500<sup>®</sup> Index. The BXY is a passive total return index based on (1) buying an S&P 500 stock index portfolio, and (2) "writing" (or selling) a near-term S&P 500 Index (SPX<sup>SM</sup>) "covered" call option, generally on the third Friday of each month. The CBOE calculates the BXY using the same methodology as for the BXM but using a 2% out-of-the-money strike instead of an at-of-the-money strike.

The historical series for BXY data prior to March 2006 is calculated using the BXM methodology used prior to June 18, 2004 (see footnote 4 below for more details).

Starting on March 17, 2006, the BXY is calculated using the revised BXM methodology in place since June 18, 2004. As explained in more detail below, on the third Friday of the month, the new S&P call option is deemed sold at a price equal to the volume-weighted average of the traded prices ("VWAP") of the new call option during the half-hour period beginning at 11:30 a.m. Eastern Time.

For more information on the BXY Index, please visit the website <a href="www.cboe.com/BXY">www.cboe.com/BXY</a> or send an e-mail to institutional@cboe.com.

The CBOE S&P 500 2% OTM BuyWrite Index (the "BXYSM" or the Index Design. "BXY Index") measures the total rate of return of a hypothetical "covered call" strategy applied to the S&P 500 Composite Price Index (the "S&P 500® Index"). This strategy, which we refer to as the "BXY covered call strategy," consists of a hypothetical portfolio consisting of a "long" position indexed to the S&P 500 Index on which are deemed sold a succession of one-month, 2% out-of-the-money call options on the S&P 500 Index listed on the Chicago Board Options Exchange (CBOE). We refer to this hypothetical portfolio as the "covered 2% out-of-the-money S&P 500 Index portfolio." The BXY Index provides a benchmark measure of the total return performance of this hypothetical portfolio. Dividends paid on the component stocks underlying the S&P 500 Index and the dollar value of option premium deemed received from the sold call options are functionally "re-invested" in the covered S&P 500 Index portfolio. The BXY Index is based on the cumulative gross rate of return of the covered S&P 500 Index portfolio since the inception of the BXY Index on June 1, 1988, when it was set to an initial value of 100.00.

The BXY covered call strategy requires that each S&P 500 Index call option in the hypothetical portfolio be held to maturity, generally the third Friday of each month. The call option is settled against the Special Opening Quotation (or SOQ, ticker "SET") of the S&P 500 Index used as the final settlement price of S&P 500 Index call options<sup>1</sup>. The SOQ is a special calculation of the S&P 500 Index that is compiled from the opening

<sup>&</sup>lt;sup>1</sup> If the third Friday is an exchange holiday, the call option will be settled against the SOQ on the previous business day and the new call option will be selected on that day as well.

prices of component stocks underlying the S&P 500 Index. The SOQ calculation is performed when all 500 stocks underlying the S&P 500 Index have opened for trading, and is usually determined before 11:00 a.m. ET<sup>2</sup>. The final settlement price of the call option at maturity is the greater of 0 and the difference between the SOQ minus the strike price of the expiring call option.

Subsequent to the settlement of the expiring call option, a new 2% out-of-the-money call option expiring in the next month is then deemed written, or sold, a transaction commonly referred to as a "roll." The strike price of the new call option is the S&P 500 Index call option listed on the CBOE with the closest strike price above the last value of the S&P 500 Index reported before 11:00 a.m. ET³. For example, if the last S&P 500 Index value reported before 11:00 a.m. ET is 1285.28 and the closest listed S&P 500 Index call option strike price above 1.02\*1285.28 is 1315, then the 1315 strike S&P 500 Index call option is selected as the new call option to be incorporated into the BXY Index. The long S&P 500 Index component and the short call option component are held in equal notional amounts, i.e., the short position in the call option is "covered" by the long S&P 500 Index component.

Once the strike price of the new call option has been identified, the new call option is deemed sold at a price equal to the volume-weighted average of the traded prices ("VWAP") of the new call option during the half-hour period beginning at 11:30 a.m. ET.<sup>4</sup> The CBOE calculates the VWAP in a two-step process: first, the CBOE excludes trades in the new call option between 11:30 a.m. and 12:00 p.m. ET that are identified as having been executed as part of a "spread", and then the CBOE calculates the weighted average of all remaining transaction prices of the new call option between 11:30 a.m. and 12:00 p.m. ET, with weights equal to the fraction of total non-spread volume transacted at each price during this period. The source of the transaction prices used in the calculation of the VWAP is CBOE's Market Data Retrieval ("MDR") System<sup>5</sup>. If no transactions occur in the new call option between 11:30 a.m. and 12:00 p.m. ET, then the new call option is deemed sold at the last bid price reported before 12:00 p.m. ET. The value of option premium deemed received from the new call option is functionally "reinvested" in the portfolio.

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<sup>&</sup>lt;sup>2</sup> If one or more stocks in the S&P 500 Index do not open on the day the SOQ is calculated, the final settlement price for SPX options is determined in accordance with the Rules and By-Laws of the Options Clearing Corporation.

<sup>&</sup>lt;sup>3</sup> If the last value of the S&P 500 Index reported before 11:00 a.m. ET is exactly equal to a listed S&P 500 Index call option strike price, then the new call option is the S&P 500 Index call option with that exact atthe-money strike price.

<sup>&</sup>lt;sup>4</sup> The timing of the roll and the price used to sell the new BXM call have changed over time. The monthly roll originally occurred at the close of trading on the third Friday of the month, i.e. the strike price of the new call was determined at 4:00 p.m. EST, and the new call was deemed to be sold at the last bid price before 4:00 p.m. EST. Since October 16, 1992, the BXM call has been rolled at 11:00 a.m. instead. Starting on June 18, 2004, the new call was sold at the VWAP to facilitate execution of the BXM covered call strategy. The methods used to calculate the BXY historical series follow this evolution. However the call will be sold to the VWAP starting on March 17, 2006.

<sup>&</sup>lt;sup>5</sup> Time & Sales information from CBOE's MDR System is disseminated through the Options Price Reporting Authority (OPRA) and is publicly available through most price quote vendors.

<u>Index Calculation.</u> The BXY Index is calculated in real-time by the CBOE every fifteen seconds during each trading day excluding roll dates [for the respective components of the covered S&P 500 Index portfolio]. The BXY Index is a chained index, i.e., its value is equal to 100 times the cumulative product of gross daily rates of return of the covered S&P 500 Index portfolio since the inception date of the BXY Index. On any given day, the BXY Index is calculated as follows:

$$BXY_{t} = BXY_{t-1}(1+R_{t})$$

where R<sub>t</sub> is the daily rate of return of the covered S&P 500 Index portfolio. This rate includes ordinary cash dividends paid on the stocks underlying the S&P 500 Index that trade "ex-dividend" on that date.

On each trading day excluding roll dates, the daily gross rate of return of the BXY equals the change in the value of the components of the covered S&P 500 Index portfolio, including the value of ordinary cash dividends payable on component stocks underlying the S&P 500 Index that trade "ex-dividend" on that date, as measured from the close in trading on the preceding trading day. The gross daily rate of return is equal to:

$$1 + R_{t} = (S_{t} + Div_{t} - C_{t})/(S_{t-1} - C_{t-1})$$

In this equation,  $S_t$  is the closing value of the S&P 500 Index at date t, Div<sub>t</sub> represents the ordinary cash dividends payable on the component stocks underlying the S&P 500 Index that trade "ex-dividend" at date t expressed in S&P 500 Index points, and  $C_t$  is the arithmetic average of the last bid and ask prices of the call option reported before 4:00 p.m. ET at date t.  $S_{t-1}$  is the closing value of the S&P 500 Index on the preceding trading day and  $C_{t-1}$  is the average of the last bid and ask prices of the call option reported before 4:00 p.m. ET on the preceding trading day.

On roll dates, the gross daily rate of return is compounded from three gross rates of return, the gross rate of return from the previous close to the time the SOQ is determined and the expiring call is settled; the gross rate of return from the SOQ to the initiation of the new call position and the gross rate of return from the time the new call option is deemed sold to the close of trading on the roll date, expressed as follows:

$$1 + R_t = (1 + R_a) \times (1 + R_b) \times (1 + R_c)$$

where:

$$1 + R_a = (S^{SOQ} + Div_t - C_{Settle})/(S_{t-1} - C_{t-1});$$

$$1 + R_b = (S^{VWAV})/(S^{SOQ})$$
; and 
$$1 + R_c = (S_t - C_t)/(S^{VWAV} - C_{VWAP})$$

In this equation,  $R_a$  is the rate of return of the covered S&P 500 Index portfolio from the previous close of trading through the settlement of the expiring call option.  $S^{SOQ}$  is the Special Opening Quotation used in determining the settlement price of the expiring call option. As previously defined, Div<sub>t</sub> represents dividends on S&P 500 Index component stocks determined in the same manner as on non-roll dates, and  $C_{Settle}$  is the final settlement price of the expiring call option.  $S_{t-1}$  and  $C_{t-1}$  are determined in the same manner as on non-roll dates.

 $R_b$  is the rate of return of the un-covered S&P 500 Index portfolio from the settlement of the expiring option to the time the new call option is deemed sold.  $S^{vwav}$  is the volume-weighted average value of the S&P Index based on the same time and weights used to calculate the VWAP in the new call option

 $R_c$  is the rate of return of the covered S&P 500 Index portfolio from the time the new call option is deemed sold to the close of trading on the roll date. As defined above,  $S^{vwav}$  is the is the volume-weighted average value of the S&P Index based on the same time and weights used to calculate the VWAP in the new call option.  $C_{vwap}$  is the volume-weighted average trading price of the new call option between 11:30 a.m. and 12:00 p.m. ET and  $C_t$  refers to the average bid/ask quote of the new call option reported before 4:00 p.m. ET on the roll date.

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The CBOE S&P 500 2% OTM BuyWrite Index (BXYSM) is designed to represent a hypothetical buy-write strategy. Like many passive indexes, the BXY Index does not take into account significant factors such as transaction costs and taxes and, because of factors such as these, many or most investors should be expected to underperform passive indexes. In the construction of the hypothetical BXY index, the SPX calls are assumed to be written at a certain price on the third Friday of the month. However, there is no guarantee that all investors will be able to sell at this price, and investors attempting to replicate the BXY Index should discuss with their brokers possible timing and liquidity issues. Transaction costs for a buy-write strategy such as the BXY could be significantly higher than transaction costs for a passive strategy of buying-and-holding stocks. Past performance does not guarantee future results. Standard & Poor's®, S&P®, and S&P 500<sup>®</sup> are registered trademarks of The McGraw-Hill Companies, Inc. and are licensed for use by the Chicago Board Options Exchange, Incorporated (CBOE). CBOE, not S&P, calculates and disseminates the BXY Index. CBOE® and Chicago Board Options Exchange® are registered trademarks of the CBOE, and SPX<sup>SM</sup>, BXM<sup>SM</sup> and BXY<sup>SM</sup> are servicemarks of the CBOE. The methodology of the CBOE S&P 500 2% OTM BuyWrite Index is owned by CBOE and may be covered by one or more patents or pending patent applications.

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