S&P Dow Jones Indices

A Division of S&P Global

S&P 500 Dynamic Volatility Covered Call Indices
Methodology

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Introduction

Index Objective

The S&P 500 Dynamic Volatility Covered Call Indices measure the performance of a rolling long position in the S&P 500 Total Return Index and a conditional short position in a standard S&P 500 weekly call option. The short call position only initiates if the 10-day volatility of the S&P 500 is greater than the 20-day, 100-day and 200-day volatilities. By comparing the immediate-term volatility to the short-term, medium-term, and long-term volatility, the indices write call options to capitalize on heightened volatility periods without foregoing upside participation during periods of low volatility.

For information on the S&P 500, please refer to the U.S. Indices Methodology, available at www.spglobal.com/spdji/.

Index Family

S&P 500 Dynamic Volatility Covered Call Index. The index selects the strike based on a time-weighted average price (TWAP) of the S&P 500 level calculated on the rebalancing effective date and holds the option position, if initiated, until maturity.

S&P 500 Dynamic Covered Call Index. The index selects the strike based on the closing level of the S&P 500 one trading day prior to the rebalancing effective date and closes out the option position, if initiated, one trading day prior to maturity.

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology	Equity Indices Policies & Practices
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices' Options Indices Policies and Practices Methodology	Options Indices Policies & Practices Methodology
S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology	Commodities Indices Policies & Practices

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

Index Construction

S&P 500 Dynamic Volatility Covered Call Index

At each rebalancing, if the immediate-term volatility of the S&P 500 daily return is greater than the short-term, medium-term, and long-term volatility of the S&P 500, the index initiates a short position in an S&P 500 weekly call option and holds it to maturity. The call option's expiration date is the Friday of the subsequent week from the rebalancing day. If that Friday is a U.S. market holiday, the call option's expiration date changes to one day prior.

Strike Selection

Select the strike, K_t, of the call option as the smallest strike value that satisfies the following equation:

$$K_t \geq 1.025 \times SPX_{TWAP,t} \quad (1a)$$

where:

$$SPX_{TWAP,t} = TWAP(S\&P\ 500\ Index, t, StartTime, EndTime, 15\ sec)$$

For detailed information of how the TWAP is calculated, please refer to Appendix A.

Total Return Index Calculation

On the index base date, $t = 0$, the values of the index and equity initialize to the base value, whereas the value of the call is set to 0. On any business day t, after the base date, the index floors at zero and calculates as follows:

$$Index_t = Max\ (0, Equity_t - Call_t) \quad (2)$$

where:

$Equity_t$ = Notional investment in the S&P 500 Total Return Index, as defined in (3a) and (3b)

$Call_t$ = Value of the short call position, as defined in (4a) and (4b)

If t is not a Rebalancing Day

The value of the equity and short call calculate as follows:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} \quad (3a)$$

$$Call_t = N_t \times Mid_t \quad (4a)$$

where:

$SPTR_t$ = Closing level of the S&P 500 Total Return Index on day t

N_t = Number of the short call option at the end of day t

Mid_t = Mid-price of the short call option at the end of day t

The number, N_t, and strike, K_t, of the short call remain the same:

$$N_t = N_{t-1} \quad (5a)$$

$$K_t = K_{t-1} \quad (1b)$$

If t is a Rebalancing Day

The value of the equity and short call calculate as follows:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} - N_{t-1} \times \max(0, SPX_t - K_{t-1}) + N_t \times Bid_t \quad (3b)$$

$$Call_t \quad = N_t \times Mid_t \quad (4b)$$

where:

SPX_t = S&P 500 level as of day t

Bid_t = Bid price of short call option at the end of day t

The number of new call option calculates as:

$$N_t = \delta_t \times \frac{Index_{t-1}}{SPX_{t-1}} \quad (5b)$$

The parameter, δ_t, controls whether to initiate a new short call option position and calculates as:

$$\delta_t = \begin{cases} 0, & Vol_{t-1}^{SPX,10D} < \max\left(Vol_{t-1}^{SPX,20D}, Vol_{t-1}^{SPX,100D}, Vol_{t-1}^{SPX,200D}\right) \\ 1, & Vol_{t-1}^{SPX,10D} \geq \max\left(Vol_{t-1}^{SPX,20D}, Vol_{t-1}^{SPX,100D}, Vol_{t-1}^{SPX,200D}\right) \end{cases} \quad (6)$$

where:

$Vol_{t-1}^{SPX,10D}$ = Volatility of daily returns of S&P 500 over the past 10 trading days as of $t-1$

$Vol_{t-1}^{SPX,20D}$ = Volatility of daily returns of S&P 500 over the past 20 trading days as of $t-1$

$Vol_{t-1}^{SPX,100D}$ = Volatility of daily returns of S&P 500 over the past 100 trading days as of $t-1$

$Vol_{t-1}^{SPX,200D}$ = Volatility of daily returns of S&P 500 over the past 200 trading days as of $t-1$

S&P 500 Dynamic Covered Call Index

At each rebalancing, if the immediate-term volatility of the S&P 500 daily return is greater than the short-term, medium-term, and long-term volatility of the S&P 500, the index initiates a short position in an S&P 500 weekly call option and closes it out one trading day prior to maturity. The call option's expiration date is the Friday of the subsequent week from the rebalancing day. If that Friday is a U.S. market holiday, the expiration date of the call option changes to one day prior.

Strike Selection

Select the strike, K_t, of the call option as the smallest strike value that satisfies the following equation:

$$K_t \geq 1.03 \times SPX_{t-1} \quad (7a)$$

where:

SPX_{t-1} = The closing level of the S&P 500 as of day $t-1$

Total Return Index Calculation

On the index base date, $t = 0$, the values of the index and equity initialize to the base value, whereas the value of the call is set to 0. On any business day t, after the base date, the index floors at zero and calculates as follows:

$$Index_t = Max\,(0, Equity_t - Call_t) \quad (8)$$

where:

$Equity_t$ = Notional investment in the S&P 500 Total Return Index, as defined in (9a), (9b) and (9c)

$Call_t$ = Value of the short call position, as defined in (10a), (10b) and (10c)

If t is not a Rebalancing Day and is not one trading day prior to a Rebalancing Day

The value of the equity and short call calculate as follows:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} \quad (9a)$$

$$Call_t = N_t \times Mid_t \quad (10a)$$

where:

$SPTR_t$ = Closing level of the S&P 500 Total Return Index on day t

N_t = Number of the short call option at the end of day t

Mid_t = Mid-price of the short call option at the end of day t

The number, N_t, and strike, K_t, of the short call remain the same:

$$N_t = N_{t-1} \quad (11a)$$

$$K_t = K_{t-1} \quad (7b)$$

If t is exactly one trading day prior to a Rebalancing Day

The value of the equity, short call, and the number of call option calculate as follows:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} - N_{t-1} \times Ask_t \quad (9b)$$

$$Call_t = 0 \quad (10b)$$

$$N_t = 0 \quad (11b)$$

where:

Ask_t = Ask-price of the short call option at the end of day t

If t is a Rebalancing Day

The value of the equity and short call calculate as follows:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} + N_t \times Bid_t \quad (9c)$$

$$Call_t = N_t \times Mid_t \quad (10c)$$

where:

Bid_t = Bid price of short call option at the end of day t

The number of new call option calculates as:

$$N_t = \delta_t \times \frac{Index_{t-1}}{SPX_{t-1}} \quad (11c)$$

The parameter, δ_t, controls whether to initiate a new short call option position and calculates as:

$$\delta_t = \begin{cases} 0, & Vol_{t-1}^{SPX,10D} < \max\left(Vol_{t-1}^{SPX,20D}, Vol_{t-1}^{SPX,100D}, Vol_{t-1}^{SPX,200D}\right) \\ 1, & Vol_{t-1}^{SPX,10D} \geq \max\left(Vol_{t-1}^{SPX,20D}, Vol_{t-1}^{SPX,100D}, Vol_{t-1}^{SPX,200D}\right) \end{cases} \quad (12)$$

where:

$Vol_{t-1}^{SPX,10D}$ = Volatility of daily returns of S&P 500 over the past 10 trading days as of $t-1$

$Vol_{t-1}^{SPX,20D}$ = Volatility of daily returns of S&P 500 over the past 20 trading days as of $t-1$

$Vol_{t-1}^{SPX,100D}$ = Volatility of daily returns of S&P 500 over the past 100 trading days as of $t-1$

$Vol_{t-1}^{SPX,200D}$ = Volatility of daily returns of S&P 500 over the past 200 trading days as of $t-1$

Index Maintenance

Rebalancing

The indices rebalance weekly on Fridays after market close. If the rebalancing day occurs on a U.S. market holiday, the rebalancing day changes to one day prior, and the process otherwise executes in the same way.

S&P 500 Dynamic Volatility Covered Call Index. The start and end times to calculate the TWAP used in strike selection are defined as follows:

- For any regularly scheduled full trading day, the TWAP period is from 3:44:00 PM to 3:45:00 PM ET.
- For any regularly scheduled early market closure trading day (1:00 PM ET), the TWAP period is from 12:44:00 PM to 12:45:00 PM ET.

For information on the impact of unavailable pricing on the TWAP calculation, please refer to the S&P Dow Jones Indices' Commodities Indices Policies & Practices Methodology.

Pricing

Options prices are provided via vendor feed after market close.

For further information on pricing, please refer to S&P Dow Jones Indices' Options Indices Policies & Practices Methodology.

Currency of Calculation and Additional Index Return Series

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to: currency, currency hedged, decrement, fair value, inverse, leveraged, and risk control versions. For a list of available indices, please refer to *S&P DJI Methodology & Regulatory Status Database*.

For information on the calculation of different types of indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

For the inputs necessary to calculate certain types of indices, including decrement, dynamic hedged, fair value, and risk control indices, please refer to the Parameters documents available at www.spglobal.com/spdji/.

Base Date and History Availability

The index history availability, base date, and base value are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P 500 Dynamic Volatility Covered Call Index[1]	12/29/2023	01/06/2012	01/06/2012	100
S&P 500 Dynamic Covered Call Index	06/06/2025	05/23/2011	05/23/2011	100

[1] Prior to May 2017, there were no PM-Settled SPX Weekly options with an expiry date corresponding to the third Friday of a month. For a detailed description of the modified calculation used during this period, please refer to *Appendix B*.

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the index. All Committee members are full-time professional members of S&P Dow Jones Indices staff. The Index Committee meets regularly. At each meeting, the Index Committee reviews any significant market events. In addition, the Index Committee may revise index policy for timing of rebalancings or other matters.

S&P Dow Jones Indices considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology and/or Options Indices Policies & Practices Methodology.

Index Policy

Announcements

Announcements of the daily index values are made after the market close each day.

Holiday Schedule

The index calculates daily when the underlying equity index calculates.

A complete holiday schedule for the year is available at www.spglobal.com/spdji/.

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Recalculation Policy

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology and Options Indices Policies & Practices Methodology for the underlying indices, respectively.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices and Options Indices Policies & Practices Methodology documents for the underlying indices, respectively.

Contact Information

For questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices Web site at *www.spglobal.com/spdji/*, major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

Tickers

The table below lists headline indices covered by this document. All versions of the below indices that may exist are also covered by this document. Please refer to *S&P DJI Methodology & Regulatory Status Database* for a complete list of indices covered by this document.

Index	BBG	RIC
S&P 500 Dynamic Volatility Covered Call Index (USD) TR	SP500DVC	.SP500DVC
S&P 500 Dynamic Covered Call Index (USD) TR	SPXDCC3	.SPXDCC3

Index Data

Daily constituent and index level data are available via subscription.

For product information, please contact S&P Dow Jones Indices, www.spglobal.com/spdji/en/contact-us.

Web site

For further information, please refer to S&P Dow Jones Indices Web site at www.spglobal.com/spdji/.

Appendix A

Index TWAP Calculation

Given an intraday time window, *h*, defined by a window start time and a window end time, to calculate the TWAP for an index, first group the tick level pricing data as follows:

- The time window is defined as beginning at (and including) the start time and ending at (and excluding) the end time.
- The time window is then split into *k* intervals depending on the provided interval length parameter.
    - For example, assuming start time of 8:30:00, end time of 8:45:00, and *interval = 60s*, meaning 60 seconds, there will be *k = 15*, 60-second intervals starting at each minute from 8:30 to 8:44.
    - For the same start and end time, if *interval = 1s,* meaning 1 second, there will be *k = 900,* 1-second intervals starting at each second from 8:30:00 to 8:44:59.
- For each interval, keep the last available index level in that interval (inclusive of the start time and exclusive of the end time)

On a day *t*, for a given time window *h*, and interval within that window, *k,*

$IndexLevel_t^{h,k}$ = Last index level in interval *k* of time window *h* on day *t*

The TWAP for the index is calculated as:

$$TWAP(Index, t, StartTime_h, EndTime_h, interval) = \frac{\sum_k \left(\delta_t^{h,k} \times IndexLevel_t^{h,k}\right)}{\sum_k \delta_t^{h,k}}$$

where:

$$\delta_t^{h,k} = \begin{cases} 1 & \text{if } IndexLevel_t^{h,k} \text{ exists} \\ 0 & \text{otherwise} \end{cases}$$

Appendix B

Historical Back-Test Rule Deviations

Lack of PM-Settled Friday expiry Options on the third Friday of any month

PM-settled S&P 500 options with the third Friday of each month as the expiry date began trading in May 2017. Prior to May 2017, there were no PM-settled weekly options issued with an expiry date equal to the third Friday of each month because AM-settled monthly S&P 500 options would expire on that day.

Therefore, before April 21, 2017, if $\delta_t > 0$, for the second Friday of the month, then the option that was initiated on that second Friday was an AM-settled option expiring on the third Friday of the month. In this scenario, the next rebalance date changed to Thursday instead of Friday to close out the monthly option one day before expiry. The value of the equity on these Thursday rebalance dates calculates as:

$$Equity_t = Equity_{t-1} \times \frac{SPTR_t}{SPTR_{t-1}} - N_{t-1} \times Ask_t^{K_{t-1}} + N_t \times Bid_t$$

where:

$Ask_t^{K_{t-1}}$ = Ask price of the option associated with strike, K_{t-1}, at the end of day *t*

For example, December 11, 2015 was the second Friday of the month. If $\delta_t > 0$ on that day, the index initiated a short option position that was an AM-settled option expiring on December 18, 2015. As a result, the next rebalance date is on December 17, 2015, as opposed to December 18, 2015.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates ("S&P DJI") defines various dates to assist our clients by providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index's launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history

will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US $100,000 investment for a 12-month period (or US $10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US $1,650), the net return would be 8.35% (or US $8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US $5,375, and a cumulative net return of 27.2% (or US $27,200).

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