Cboe Global Indices

Consultation Regarding Modification to Theoretical Options Pricing Source for SPAI Index and Dividend Sourcing for SPAI & SPATI Indices

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OVERVIEW

August 8, 2025: Cboe Global Indices, LLC ("CGI") is conducting a consultation with members of the financial community regarding a potential modification to the theoretical options pricing source for the Cboe S&P 500 Dividend Aristocrat Target Income Index (SPAI), and a potential modification to the sourcing of the expected dividend yield for the Cboe S&P 500 Dividend Aristocrat Target Income Index (SPAI) and the Cboe S&P 500 Dividend Aristocrat Target Income Index Monthly Series (SPATI), together referred to as "the Indices".

An analysis comparing the current Indices' levels versus a proforma back-test based on the proposed methodology is available upon request.

IMPACTED INDICES

Index Name	Index Ticker	Proposed Changes	Methodology Document
Cboe S&P 500 Dividend Aristocrat Target Income Index	SPAI	- Theoretical Options Pricing Source - Sourcing of expected dividend yield	Cboe S&P 500 Dividend Aristocrats Target Income Indices Methodology
Cboe S&P 500 Dividend Aristocrat Target Income Index Monthly Series	SPATI	- Sourcing of expected dividend yield	

SUMMARY OF PROPOSED CHANGES

1. Modification to the Theoretical Options Pricing Source - SPAI Index

Summary: CGI proposes to modify the source of the theoretical options prices used in the calculations of the SPAI Index. Currently, the theoretical option prices used in the index calculations, are generated using a volatility surface constructed in accordance with the Cboe European-Style Options Implied Volatility Calculation Methodology. CGI proposes to modify the theoretical options pricing source to use Cboe Hanweck Options Analytics as described in the Cboe TPS Policies & Practices Methodology.

CGI considers the proposed change to the source of theoretical options pricing an enhancement; the Cboe Hanweck Options Analytics theoretical pricing methodology optimizes valuations via a wider range of options pricing models. Additionally, the change enables theoretical options prices to be updated intraday in the index calculation at an increased frequency. Currently only a daily closing value is disseminated for the SPAI index; the modification to pricing source enables updates every 15 seconds.

- **Current Methodology**:

The calculation for SPAI uses theoretical options prices. The options prices used in the calculation are theoretical values generated using a volatility surface constructed in accordance with the Cboe European-Style Options Implied Volatility Calculation Methodology. The strike prices for the options used in the calculation are the theoretical option strikes equal to the last trade price of the stock prior to the 4:00 p.m. ET close with an expiration date equal to the next roll date. The model is constructed using an implied volatility surface from the constituents' listed options prices by applying the spline method for interpolation and the SABR model for extrapolation. The spline interpolation is a form of interpolation where the interpolant is a piecewise-defined function by polynomials. The SABR model is a stochastic volatility model, which attempts to capture the volatility smile in derivatives markets. The name stands for "stochastic alpha, beta, rho", referring to the parameters of the model, introduced by Hagan et.al., as an attempt to model the volatility surface and capture the empirically observed dynamic behavior of the smile. Valuations are then calculated for the theoretical options on the roll dates and at 4:00 p.m. ET each trading date.

- **Proposed Methodology**:

The option prices used in the calculation of the SPAI index are theoretical values generated using Cboe Hanweck Options Analytics theoretical prices as a primary source as described in the Cboe_TPS_Policies_Practices[1].

[1] For the backtested history and live history prior to <effective date>, Cboe's legacy Theoretical Options Pricing Model was used for the valuation of theoretical options.

2. Modification to Sourcing of Expected Dividend Yield – SPAI & SPATI Indices

Summary: The roll-date calculations of the Indices use projected dividends to calculate the percentage of the portfolio overwritten. Currently, the roll-date calculations of the Indices use past dividend yield to determine the expected dividend yield for the S&P 500 Dividend Aristocrats index components, and expected dividend yield to determine projected dividends for the S&P 500 index. To align sourcing and methodology for the expected dividend yield, CGI proposes to use the Indicated Annualized Dividend Yield for both the S&P 500 index and the S&P 500 Dividend Aristocrats index components.

- **Current Methodology**:

The roll date return of the Indices is calculated in the same way as the non-roll date:

$$(1+ R_t) = \sum_{i=1}^{n} \omega_{iot}(1 + R_{it})$$

On roll dates, the return for each stock is equal to:

$$1 + R_{it} = (S_t + Div_t - PO_i C_t) \,/\, (S_{t-1} - PO_i C_{t-1})$$

$$PO_i = Min[100\%, [TargetIncomePercentage + E(Div_{SP}) - AD_T] \,/\, AP_{Roll}]$$

$$AD_T = 4 * \sum_{i=1}^{n} \omega_{it-1} Div_{iRoll}$$

$$Div_{Roll} = \frac{Next\ expected\ Quarterly\ Dividend}{S_{Roll}}$$

$$AP_{Roll} = NrRollsPerYear * \sum_{i=1}^{n} \omega_{it-1} CP_{Roll}$$

$$CP_{Roll} = \frac{Premium\ received\ from\ written\ call\ option}{S_{Roll}}$$

where:

- $TargetIncomePercentage$ is the target % of annualized income generated over the annual dividend yield of the S&P 500 Index, as specified in section 2.3;
- $E(Div_{SP})$ is the annualized expected dividend yield of the S&P 500 Index between the previous reconstitution date T and the next reconstitution date T+1;
- AD_T is the annualized dividend level for the portfolio obtained from expected quarterly dividend level;
- AP_{Roll} is the annualized premium from written call options;
- $NrRollsPerYear$ is the number of rolls per year, as specified in section 2.3;
- CP_{Roll} is the premium received from written call options divided by the underlying index level; and
- Div_{Roll} is the next expected Quarterly Dividend level for stock i dividend by the underlying index level.

- **Proposed Methodology**:

The roll date return of the Indices is calculated in the same way as the non-roll date:

$$(1 + R_t) = \sum_{i=1}^{n} \omega_{iot}(1 + R_{it})$$

On roll dates, the return for each stock is equal to:

$$1 + R_{it} = (S_t + Div_t - PO_i C_t) / (S_{t-1} - PO_i C_{t-1})$$

$$PO_i = Min[100\%, [TargetIncomePercentage + E(Div_{SP}) - AD_T] / AP_{Roll}]$$

$$AP_{Roll} = NrRollsPerYear * \sum_{i=1}^{n} \omega_{it-1} CP_{Roll}$$

$$CP_{Roll} = \frac{Premium\ received\ from\ written\ call\ option}{S_{Roll}}$$

where:

- $TargetIncomePercentage$ is the target % of annualized income generated over the annual dividend yield of the S&P 500 Index, as specified in section 2.3;
- S_{Roll} is the closing value of the underlying index on the roll date;
- **$E(Div_{SP})$ is the Indicated Annualized Dividend Yield ("IAD YLD") for the S&P 500 Index as of the end of the previous month[1];**
- **AD_T is the Indicated Annualized Dividend Yield ("IAD YLD") for the S&P 500 Dividend Aristocrats Index as of the end of the previous month[1];**
- AP_{Roll} is the annualized premium from written call options;
- $NrRollsPerYear$ is the number of rolls per year, as specified in section 2.3; and
- CP_{Roll} is the premium received from written call options divided by the underlying index level.

[1] The IAD YLD is determined by calculating the annualized projected dividend income (for a given company, the latest dividend per share is multiplied by the number of dividend payments per year) expressed in index points, and dividing the projected income by the spot Index level as of the publication date.

TIMING OF CONSULTATION AND POTENTIAL CHANGES

The consultation period will end at the close of business on **Friday, September 12, 2025**.

Following the close of the consultation period, all feedback will be reviewed and considered. The Index Committee will decide whether to implement any of the proposed changes and announce the consultation results. An additional consultation may be initiated if CGI has additional questions.

Consultation results are currently expected to be available the week of **Monday, September 22, 2025**. If the proposed changes are adopted, the changes are expected to become effective per the roll on **Friday, October 17, 2025**.

CONSULTATION QUESTIONS

In responding to this consultation, please address the following questions. Additionally, please include other information you feel would be helpful for assessing the subject matter of this consultation.

1. Do you agree with the proposed modification to the theoretical options pricing source used in the calculations of the SPAI index?
2. Do you agree with the proposed modification to the sourcing of expected dividend yield used in the Indices?
3. Do you agree with the proposed timeline to implement the changes?
4. Any additional comments or suggestions?

To participate in this consultation, please send responses to: IndexConsultation@cboe.com

Please include "Index Consultation: Modification to Theoretical Options Pricing Source for SPAI Index and Dividend Sourcing for SPAI & SPATI Indices" in the subject line of any response.

We appreciate your participation in this consultation and will publish a summary of feedback in the results announcement. No feedback will be attributed to a particular respondent in the summary published.

Consultation documents can be accessed here.

ADDITIONAL INFORMATION

Please contact the Cboe Operations Support Center with technical questions, or the Cboe Index Data Group with market data questions.

We appreciate your business. Our trading community inspires and drives our purpose of building trusted markets.

Cboe Operations Support Center

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