



Cboe Global Indices

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# Cboe Realized Volatility Index Series

## METHODOLOGY

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# 1 Introduction

This document provides a transparent and easily accessible view of the methodology used to calculate the Cboe Realized Volatility Index Series (RVOL), collectively referred to in this document as “the Indices”.

## 1.1 Index Objective

The Cboe Realized Volatility Index Series (the “Indices”) is part of a family of Realized Volatility Indices. The indices are designed to provide the magnitude of daily price movements by measuring the annualized standard deviation in the daily price return of an underlying over a specific period. To derive the underlying price, we use the put-call parity relationship. We use the nearest term put and call options around the at-the-money strike with greater than or equal to 1 day to expiration. These include SPX options with “standard” 3rd Friday expiration dates and “weekly” SPX options that expire every Friday, except the 3rd Friday of each month.

## 1.2 Supporting Documentation

This Methodology should be read in conjunction with the following document:

[Cboe\\_Index\\_Policies\\_Practices](#)

# 2 Index Construction

Under the RVOL Index Series methodology, there are four time frames and four types of daily indices. RVOL3M, RVOL6M and RVOL12M are using lookback periods of 3-month (63-trading day), 6-month (126-trading day), and 12-month (252-trading day), respectively;

- Cboe 3-Month Realized Volatility Index (Ticker: RVOL3M)
- Cboe 6-Month Realized Volatility Index (Ticker: RVOL6M)
- Cboe 12-Month Realized Volatility Index (Ticker: RVOL12M)

There is one flagship index calculated using the 1-month (21-trading day):

- Cboe Realized Volatility Index (Ticker: RVOL)

## 2.1 Options Pricing

The option quotes are sourced from the Cboe Options Exchange, via the Options Price Reporting Authority (OPRA) feed.

### 3 Index Calculations

#### Implied Spot Price

For the nearest-term options, we calculate the implied spot price by the following methodology:

Using put-call parity, we calculate the implied spot price from the European-style call and put prices around the at-the-money strike. We select the strike price at which the absolute difference between the call price and the put price is smallest at 4:00 p.m. ET on each business day.

Put-call parity states that for call and put options with the same strike and maturity:

$$S = \text{call} - \text{put} + DF \times K + \text{Div}$$

$$DF = \left(1 + \frac{R}{100}\right)^{T-t}$$

where:

- $S$  is the implied spot price;
- $\text{call}$  is the arithmetic average of the last bid and ask quotes of the SPX/SPXW Call option reported before 4:00 p.m. ET;
- $\text{put}$  is the arithmetic average of the last bid and ask quotes of the SPX/SPXW put option reported before 4:00 p.m. ET;
- $DF$  is the present value of the 1-Month Daily Treasury Par Yield Curve Rate,  $R$ , as quoted by the [U.S. Treasury](#) that matures at  $T$ ;
- $K$  is the strike price of the options;
- $T$  is the expiration date; and
- $\text{Div}$  is the expected discrete dividend amount between day  $t$  and  $T$ .

#### Calculation of Realized Volatility

At the close of every business date, each index calculates the standard deviation of daily returns of underlying price in the lookback period. We set the mean to zero.

$$\text{Index}_t = 100 \times \sqrt{\frac{252}{N} \sum_{i=1}^N \left( \ln \frac{S_{t-i+1}}{S_{t-i}} \right)^2}$$

where:

- $\text{Index}_t$  is the realized volatility level on day  $t$ ;
- $S_t$  is the values of the implied spot price on day  $t$ ; and
- $N$  is the number of trading days in the lookback period.

## 4 Calculation and Dissemination

The Indices are calculated and disseminated as follows on each business day.

Index Name	Index Ticker	Dissemination Frequency	Dissemination Hours
Cboe Realized Volatility Index	RVOL	Daily Closing Value	U.S. trading hours
Cboe 3-Month Realized Volatility Index	RVOL3M	Daily Closing Value	U.S. trading hours
Cboe 6-Month Realized Volatility Index	RVOL6M	Daily Closing Value	U.S. trading hours
Cboe 12-Month Realized Volatility Index	RVOL12M	Daily Closing Value	U.S. trading hours

A Business Day is defined as a day when the Cboe Options Exchanges are open for the Cboe Regular Trading Hours (RTH) session.

The Indices follow the [Cboe Options Exchange holiday schedule](#).

## 5 Index Information

Index Name	Index Ticker	Base Date	Launch Date	Base Value	Currency
Cboe Realized Volatility Index	RVOL	February 1, 2001	May 28, 2020	n/a	USD
Cboe 3-Month Realized Volatility Index	RVOL3M	April 3, 2001	May 28, 2020	n/a	USD
Cboe 6-Month Realized Volatility Index	RVOL6M	July 3, 2001	May 28, 2020	n/a	USD
Cboe 12-Month Realized Volatility Index	RVOL12M	January 8, 2002	May 28, 2020	n/a	USD

## 6 Appendix 1 - Changes

Major changes described in this document since August 5, 2024, are as follows:

Change Summary	Effective Date	Preview Language	Updated Language
-	-	-	-

## 7 Appendix 2 – Document Information

Version Number	2.0
Last Revised Date	August 5, 2024

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