



RealVol[®] Options

“Risk comes from not knowing what you’re doing.”

— Warren Buffet

Brochure updated: 1 September 2017

$$\sqrt{\frac{252}{n} \sum_{t=1}^n R_t^2}$$

The Concept

RealVol options settle to a calculation of realized volatility. Specifically, RealVol options will settle to the appropriate RealVol index.

Realized Volatility

Realized volatility measures the daily movement of the underlying asset regardless of direction. It is functionally different from instruments based on implied volatility.

RealVol Indices

There are many RealVol daily indices on each underlying asset (40 in total), and while they can all be used to guide investment decisions, only one will be used to settle RealVol options (the 21-day realized volatility, symbol VOL). For a complete description of all RealVol indices, please request a RealVol index brochure at realvol.com.

RealVol Formula

At the heart of the RealVol indices is the RealVol formula. It is a simple, modified standard deviation formula that sets the degrees of freedom to zero, the mean to zero, and the annualization factor to a constant 252 trading days.

RealVol Indices

RealVol indices come in two forms:

1. A daily version
2. A real-time version

RealVol Daily Indices

RealVol daily indices are based on only daily data of the underlying asset (i.e., open, high, low, and close).

RealVol Real-Time Index

The RealVol real-time index will use the real-time underlying price to estimate the RealVol daily index throughout the current trading day. At the close of the underlying market, the RealVol daily and real-time indices are equal.

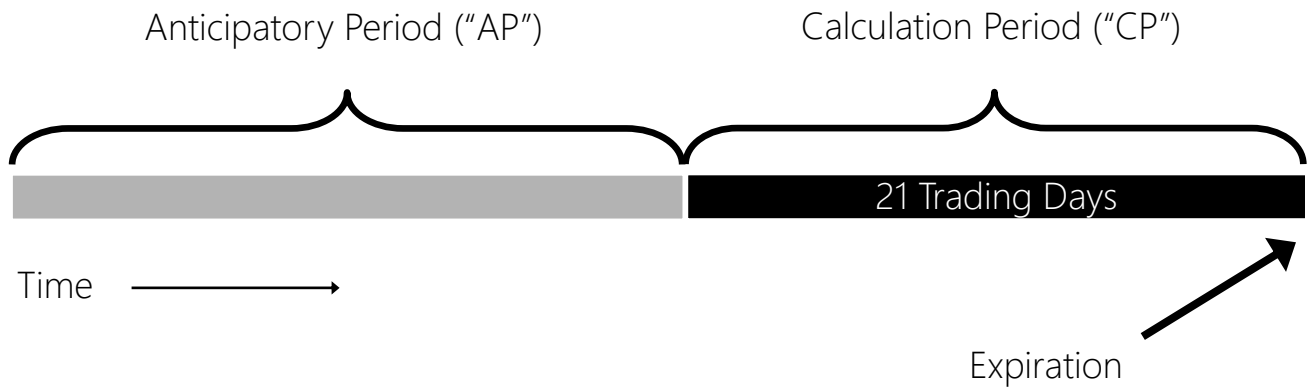
Key Contract Specifications

RealVol options will be cash settled, listed for approximately eight weeks, and will expire on Friday afternoons.

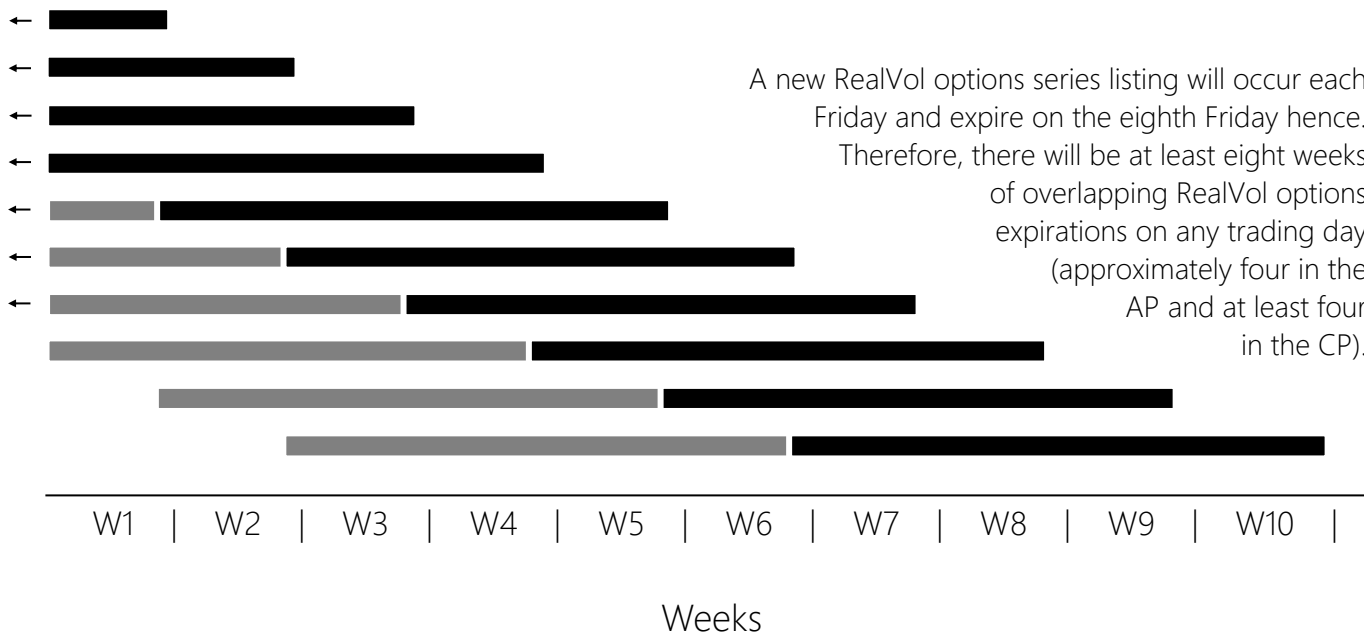
Uses

RealVol futures will allow market participants to hedge against, invest in, or trade realized volatility. They will be useful particularly for hedging the volatility component of standard options, trading with RealVol options, spreading with implied volatility instruments, and enhancing a portfolio’s risk/reward characteristics.

The Life of a RealVol® Options Contract



Listing Pattern*



*All time frames are approximate.

Comparison to Existing Products

Features	RealVol Futures (realized volatility)	VIX® Futures (implied volatility)	Volatility & Variance Swaps (realized volatility)	Delta-Neutral Hedging (realized volatility)
Expires to actual volatility or variance	✓	X Expires to a forecast	✓	? Path dependency does not provide "pure" volatility exposure
Appeals to retail traders	✓	X Difficult to understand	X No access	X Too complicated
Appeals to option market-makers	✓	X Not a good hedge For standard options	? May be difficult to execute quickly and at favorable prices	✓
Appeals to investment banks and institutions	✓	X Not a good hedge for banks' volatility exposure	✓	✓
Appeals to portfolio managers	✓	X No exposure to actual price movement	? Losses can be extreme for variance swaps	X Requires constant monitoring
Exchange-cleared (regulated with no credit risk)	✓	✓	X Subject to credit risk	✓
Difficult to manipulate index	✓	X Special opening quote at expiration that depends on liquidity	✓	✓
Transparency and price discovery	✓	✓	X No public quote	✓
Could be traded on all assets	✓	X Only on very liquid option markets	? Typically traded only in large size	✓
Easy to calculate	✓	X Formula is complex	✓	X Calculation requires execution prices and commissions for each transaction
Execution costs low	✓	✓	? No direct expense, but execution cost built into market quote	X Market spreads and commissions on all legs and follow-up trades

Detailed Information*

Contract Specifications that Apply to All RealVol Options

Symbol

VOLx (where "x" is the symbol of the underlying asset)

Contract Settlement

All RealVol options contracts will settle to the corresponding 21-trading-day RealVol index (VOL) at expiration, which itself is based on the daily closing prices of an underlying asset, instrument, or security.

Index Price

RealVol indices, which are typically expressed as a percentage, will be quoted without the percentage sign; e.g., 23.45% is quoted as 23.45.

Strike Prices

Strike prices will be listed in-, at-, and out-of-the-money. New series generally will be added when the underlying index exceeds the highest or lowest strike price available.

First Trading Day

Eighth Friday prior to expiration Friday.

Expiration Dates

Corresponding to the Friday expirations of standard weekly options on the underlying asset.

Listing Pattern

Approximately 52 weekly contracts per year with eight or nine contracts listed on any given day.

Exercise Style

European (only at expiration)

Settlement Style

Cash

Contract Specifications that Are Unique to RealVol SPY Options

Symbol

VOLS (RealVol SPY options)

Trading Hours

8:30 AM to 3:15 PM CT

Premium Quotation

Stated in points and fractions; one point equals \$100. Minimum tick for a series trading below \$3 will be 0.05 (\$5.00), above \$3 is 0.10 (\$10.00).

Strike Price Increment

0.50 points below 15.00, 1.00 point between 15.00 and 30.00, 2.50 points between 30.00 and 50.00, and 5.00 points above 50.00.

Margin

Margin has not been determined. Expected margin is as follows: Purchases of puts or calls with nine months or less until expiration must be paid for in full. Writers of uncovered puts or calls must deposit and maintain 100% of the option proceeds plus 20% of the aggregate contract value (current index value x \$100) minus the amount by which the option is out-of-the-money, if any, subject to a minimum for calls of option proceeds plus 10% of the aggregate contract value and a minimum for puts of option proceeds plus 10% of the aggregate exercise price amount.

RealVol Formula

A formula used to calculate the annualized standard deviation of continuously compounded daily returns of SPY, assuming zero degrees of freedom, a zero mean, and a constant 252 trading days in a year.

$$\text{Vol} = 100 \cdot \sqrt{\frac{252}{n} \sum_{t=1}^n R_t^2}$$

Where

- Vol = realized volatility
- n = number of trading days in the period (in this case n is normally 21)
- R_t = continuously compounded daily returns as calculated by the formula:

$$R_t = Ln \frac{P_t}{P_{t-1}}$$

Where

- Ln = natural logarithm
- P_t = Underlying Reference Price at time t
- P_{t-1} = Underlying Reference Price at the time period immediately preceding time t

Adjustments

The RealVol indices will be adjusted as applicable, for stock dividends, certain other corporate events, market disruption events, and potentially others. Please see the brochure outlining the RealVol index at realvol.com.

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*Subject to change. All contract specifications are only proposed and are subject to change based on rules of the listing exchange. RealVol SPY options have been approved for listing by the Securities and Exchange Commission (SEC). However, RealVol SPY options are not currently listed for trading on any exchange. Details may vary according to the underlying asset. See realvol.com for detailed information. The information provided herein is for informational purposes only; it must not be relied upon and Demand Derivatives Corp., RealVol LLC, or its affiliates will not be liable for actions taken or not taken in reliance thereon.