OptionMetrics Overview

OptionMetrics is a comprehensive database of historical option price, underlying security information, implied volatility, and sensitivity information for the entire US listed index and equity options markets. OptionMetrics includes approximately ten years of historical data for all US listed equities and market indices and all US listed index and equity options.

Option and Underlying Security Information Datasets

OptionMetrics is organized into 13 dataset groups that provide detailed information on US options and their underlying securities. The OptionMetrics manual provides extensive information about these dataset components in addition to the calculation algorithms of interest rate curves, dividend projections, and option implied volatilities. WRDS organized the OptionMetrics web queries into the following categories:

Option Information Datasets

The Option Price files (***opprcd1996-opprcd2005***) contain historical price, implied volatility, and sensitivity information for traded options in US option markets. The Option Info file (***opinfd***) contains company information about underlying securities. The Standardized Option Price files (***stdopd1996-stdopd2005***) contain information on "standardized" (interpolated) options. Currently, these files contain information on at-the-money-forward options with expirations of 30, 60, 91, 122, 152, 182, 365, 547, 730, 912, and 1095 calendar days. A standardized option is only included if there exists enough option price data on that date to accurately interpolate the required values. The Volatility Surface files (***vsurfd1996-vsurfd2005***) contain the interpolated volatility surface for each security on each day, using a methodology based on a kernel smoothing algorithm. The Option Volume file (***opvold***) contains daily total contract volume information for each underlying security. Volume is aggregated by calls, puts, and total. The Historical Volatility files (***hvold1996-hvold2005***) contain the realized volatility for each optionable security on each day. Realized volatility is calculated over date ranges of 10, 14, 30, 60, 91, 122, 152, 182, 273, 365, 547, and 730 calendar days, using a simple

standard deviation calculation on the logarithm of the close-to-close daily total return.

Security Information Datasets

The Security Price files (***secprd1996-secprd2005***) contain the price history for the security for the corresponding calendar year. The Security file (***securd***) contains identifying information for all equity and index securities known to OptionMetrics. The Security Name file (***secnmd***) contains a historical record of changes to the ticker, issuer and issue descriptions, and CUSIP's for a security. The Exchange file (***exchgd***) contains a historical record of changes to the active exchange for a security, and new listing and delisting information. The Distribution file (***distrd***) contains information on a security's distributions and splits.

Other Datasets

The Zero Curve file (***zerocd***) contains the current zero-coupon interest rate curve used by OptionMetrics. The Index Dividend file (***idxdvd***) contains the current dividend yield used for implied volatility calculations on index options.

Major Index Option Datasets

As elaborated in The Chicago Board Options Exchange (CBOE) website, index options allow investors to make investment decisions on a specific market industry or on the market as a whole. Indices vary in their components and contract specifications and they fit various investment strategies. Each index is unique and may cover a broad array of underlying stocks or represent a narrow sector of the market. There are different types of indices with traded options: American Style or European Style; Capitalization-weighted or Price-weighted; Broad based or Narrow based.

An important difference between a stock option and an index option is that the underlying asset covered by index options is not shares in a company, but rather an underlying dollar value equal to the index level times a multiplier of $100. The amount of cash received upon exercise or at expiration depends on the settlement value of the index in comparison to the strike price of the index option.

WRDS created separate datasets from OptionMetrics for several major index options traded in US option markets. 9200 indices were first identified in the OptionMetrics universe, out of which only 183 underlying indices have outstanding and traded options. 12 major broad based indices were selected to be part of the index option query, as they rank among the highest in terms of number of traded options and total contract volume. These 12 broad-based indices span various exchanges and they are:

1. Dow Jones Industrial Average (DJX): The Dow Jones Industrial Average is a price-weighted index composed of 30 of the largest, most liquid NYSE and NASDAQ listed stocks.
2. Nasdaq 100 Index (NDX): The Nasdaq-100 Index is a capitalization-weighted index composed of 100 of the largest non-financial securities listed on the Nasdaq Stock Market.
3. CBOE Mini-NDX Index (MNX): The CBOE Mini-NDX Index is based on 1/10th the value of the Nasdaq 100 Index (NDX).
4. AMEX Major Market Index (XMI): The Amex Major Market Index is a price weighted index of 20 blue-chip stocks representative of major US industrial corporations.

5. S&P 500 Index (SPX): The Standard & Poor's 500 Index is a capitalization-weighted index of 500 stocks from a broad range of industries. Although the S&P 500 focuses on the large-cap segment of the market, with over 80% coverage of U.S. equities, it is also an ideal proxy for the total market. S&P 500 index options are considered among the most highly liquid options in the market. The CBOE Volatility Index (VIX) is based on the S&P 500 and is considered a key measure of market expectations of near-term volatility conveyed by S&P 500 index options prices.

6. S&P 100 Index (OEX): The Standard & Poor's 100 Index is a capitalization-weighted index of 100 stocks from a broad range of industries. S&P 100 Index is a subset of S&P 500 and is made of 100 major, blue chip companies across diverse industry groups.

7. S&P MidCap 400 Index (MID): The Standard & Poor's MidCap 400 is the most widely used index for mid-sized companies. It covers approximately 7% of the U.S. equities market, and is part of a series of S&P U.S. indices that can be used as building blocks for portfolio construction.

8. S&P SmallCap 600 Index (SML): The Standard & Poor's SmallCap 600 Index is a capitalization-weighted index of 600 domestic stocks chosen for market size, liquidity and industry representation.

9. RUSSELL 2000 Index (RUT): The Russell 2000 Index is a capitalization-weighted index of the bottom 2,000 companies from a universe of the 3,000 largest U.S. stocks in NYSE, NASDAQ or the AMEX.

10. NYSE Composite Index - Old (NYZ): The old NYSE Composite Index is a capitalization-weighted index of all stocks, including ADRs, REITs, and tracking stocks, listed in the NYSE market. The index has a base value as of December 31, 1965, and was redefined in January 2003.

11. PSE Wilshire Smallcap Index (WSX): PSE Wilshire Smallcap Index measures small stocks and is a capitalization-weighted index of the next 1,750 largest stocks - from 751 to 2,500 by market cap - derived from the Dow Jones Wilshire 5000 at June 30 of each year.

12. CBOE Treasury Yield Option (TYX): Interest rate options are cash-settled options on the yield of U.S. Treasury securities. TYX options are based on 10 times the yield-to-maturity on the most recently auctioned 30-year Treasury bond, respectively. Options are European style exercise and are available in up to three near-term months followed by three additional months from the March quarterly cycle. Trading in TYX options will ordinarily cease on the business day (usually a Friday) preceding the expiration date.

Three datasets were subsequently created to include all relevant information for the underlying indices and their options. The first dataset, ***Indexd***, contains basic index information including the index name, OptionMetrics security id (secid), ticker symbol, CUSIP, description of the issue, class designator, exchange designator, exercise style (American vs. European), the method of incorporating dividends into the option calculations (discrete vs. continuous, and calculated vs. implied), and the AM settlement flag (expiration on the market open vs. market close of the last trading day).

Midxprcd includes the price history of the underlying index and all information available in the original OptionMetrics security price files. After merging with the index dividend and total contract volume files, Midxprcd includes the current dividend yield used for implied volatility calculations, in addition to the daily total contract volume information (volume vs. open interest) for each of the 12 indices. For dividend-paying indices, OptionMetrics assumes that the security pays dividends continuously, according to a continuously-compounded dividend yield.

Midxopprcd contains the historical price, implied volatility and sensitivity information for all options on the 12 underlying indices. This option-specific dataset is then merged with the zero curve file to get the

interpolated continuously compounded risk free rate.

The zero curve file contains the zero coupon interest rate curve which is calculated from a collection of continuously compounded zero-coupon interest rates at various maturities, collectively referred to as the *zero curve*. For a given option, the appropriate interest rate input corresponds to the zero-coupon rate that has a maturity equal to the option's expiration, and is obtained by linearly interpolating between the two closest zero-coupon rates on the zero curve.

Three steps are followed in calculating **the interpolated risk free return** before adding it to the major index option data. First, the actual exercise day was determined for the days to expiration and the AM settlement flag (as explained below). Then, a slope is calculated from the zero coupon interest rates with the closest maturity over their differential maturity dates. The Interpolated Risk Free Rate is calculated using the days till the actual exercise day used in step one.

Note on expiration date of index options:

The expiration date of index options is the Saturday following the third Friday of the expiration month. European index options generally may be exercised only on the last business day before the expiration date. Trading in European index options will ordinarily cease on the business day (usually a Thursday) preceding the day on which the exercise-settlement value is calculated. American index options generally may be exercised on any business day before the expiration date. Trading in American index options will ordinarily cease on the business day (usually a Friday) preceding the expiration date.

While most European options have Friday as the exercise day on which the exercise-settlement value is calculated (and which precedes the expiration day - a Saturday), many indices (like the S&P 500 index (SPX) and Russell 2000 index (RUT)) have an AM settlement flag, which means their options expire at the market open of the exercise day. For such indices, exercise settlement values are based on the reported level of the index calculated with the opening prices of the index's component stocks on the day of exercise (and sometimes the previous day's close price). Typically, trading is halted for these index options on the day before expiration, which is a Thursday. For this reason, such index options have Thursday as the actual exercise day. This actual exercise day is used in calculating the interpolated continuously compounded risk free rate and subsequently in the derivation of implied volatility and option price.

Also note that most index options have a European style in that they can only be exercised during a specified period of time prior to expiration. This period may vary with different classes of index options. Put-call parity relationship only holds exactly for European-style options. There are only a few index options which trade according to American exercise: The AMEX Computer Technology Index; the Amex Oil Index; the CBOE Internet Index; the PHLX Semiconductor Index, the PHLX Gold Index; and the CBOE S&P 100 Index. For the S&P 100 index, OptionMetrics assumes that the dividend yield is equal to that computed for the S&P 500 index. For the other American-exercise indices, OptionMetrics uses the results of the dividend regression unmodified. OptionMetrics recognizes that this may induce a slight bias into the calculations but expects the overall effect on the computed implied volatilities to be minimal.

For more information on Black-Scholes and Binomial option pricing models, examples and SAS codes, check the Research Application on Option Pricing Models

Select a Data Set:

- Select an available dataset Help me find my data

Frequently Visited Links

Vendor Manuals:
Compustat, CRSP, I/B/E/S
Sample Programs:
Compustat, CRSP, I/B/E/S
Dataset Lists
Compustat, CRSP, I/B/E/S

Get Help From WRDS

Try these support resources:

- WRDS Knowledgebase
- Data Manuals and Overviews
- Ask WRDS Support

Search WRDS

- Search