



ORATS Research and Data Guide

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Executive Summary

Option Research and Technology Services (ORATS), established in 2001, provides US equity options data designed by successful options traders. ORATS proprietary data including forecasts, implied summarizations and historical volatility readings, have been shown in backtesting to be important predictors of profitable trading strategies.

This guide is in sections:

1. [Research Explanations](#)
2. [Core General & Earnings Data Definitions](#)

1. Volatility Research

Our proprietary historical volatilities are calculated from intraday data market information and produce more accurate daily volatilities than traditional methods like close-to-close. From these accurate volatilities, we produce effective forecasts of volatility and other useful datasets.

The ORATS implied volatility summarization technique produces an accurate smoothed market value curve. This single line fits between the calls and puts bid-ask at a high rate. These volatilities create high-quality options Greeks like delta, vega, gamma, and theta. These data points are especially useful in backtesting where accuracy is important. Our method of summarizing the implied volatility surface allows simplification of strike relationships to a few factors. These factors are comparable over time and across related equities and produce an effective forecasted volatility surface.

Asset Coverage

ORATS covers all US equity options including stocks, ETFs, and indexes--nearly 5000 tickers. We characterize each symbol as a stock, ETF or index and we determine whether it is easy or hard to borrow and a dividend payer or not.

Related Data Point(s): assetType

Historical Volatility Research

To make a forecast of a variable, one must first take measurements of it. The common methods of measuring underlying volatility are close-to-close, high-low, high-low-close and GARCH. Over many years of trading, Matt Amberson, our President, and CEO, was never satisfied with any these approaches. Based on our extensive analysis, we believe we have found the most accurate historical volatility measure available using intraday analysis. Another advantage of intraday volatility readings is that a one-day volatility can be calculated. The use of shorter term volatilities can help see a change in volatility before longer term measurements. ORATS utilizes a modified open high low close intraday volatility calculation.

Related Data Point(s): or1dHv

or5dHv

cls5dHv

Ex-Earnings Historical Volatility

Close-to-close and ORATS historical volatilities are also presented with the day of and day after earnings taken out of the calculation. These calculations are important as they can be compared over time or when analyzing a non-earnings expiration.

Related Data Point(s): xErnOr5dHv

xErncls5dHv

Implied Volatility

ORATS presents the implied volatility and forecasts for the first four months with standard expirations on the third Friday of the month. Seeing all standard options expirations allows for assessment of the implied volatility across assets and against monthly forecasts.

Related Data Point(s): m1Atmlv

m2Atmlv

Interpolated Implied Volatility

The constant maturity implied volatility is calculated by measuring the two expirations around the day to be measured. ORATS presents the 20, 30, 60, 90 days and six months interpolated implied volatility.

iv20d

iv30d

Constant Maturity Ex-Earnings Implied Volatility and Earnings Effects

The most important measurements are constant maturity implied volatilities, and especially with earnings effects taken out of the implied volatility. Using the 30 calendar day implied volatility and long term 2-year points, we can interpolate for the expected at-the-money implied volatility for any time to expiration between 30 calendar days and infinity. When using the term structure equation, the volatility that is used for at-the-money options with 30 days to expiration is the same volatility that is used to price at-the-money volatilities for contracts trading with less than 30 days to expiration.

Related Data Point(s): xErnOr20dlv

xErnOrInflv

Implied Earnings Effects vs. Forecasted Earnings Effects

Once we defined a smooth surface across time to expiration and delta, we were then ready to utilize the earnings event studies of historical volatility to produce Forecasted Earnings Effects. As a result of our research, we utilize actual stock moves on earnings announcement dates to make a forecast of future moves. As a result of our accurate implied volatilities and sophisticated methods of term structure modeling, ORATS determines the additionally implied volatilities in the expiration months that are affected by earnings announcements, what we call the Implied Earnings Effects. The months that are affected by earnings announcements are those that have an expiration date after the upcoming expected earnings announcement date. With a forecast earnings announcement effect and simple variance math, we can make the correct adjustments to the implied volatility surface. In most cases, the implied volatility is increased in the months that are affected by earnings announcements since most equities are more volatile on the days surrounding an earnings announcement than would otherwise be expected. Twelve historical earnings effects are presented.

Related Data Point(s): impErnEffct

impErnMv

Earnings Event Studies

One of the other uses for this accurate volatility measure is studying a predictable event's effect. One study we perform measures the effect of periodic earnings announcements on volatility. Once the effect is measured, it can be forecast and thus, priced into the theoretical values for the expiration months it affects. This simple earn move calculation is the percentage move. The earnings effect calculation assesses the move of the stock price on announcement day regarding the percentage of market expectation of a normal move on a day without earnings.

Related Data Point(s): ernEffect1

ernMv1

absAvgErnMv

Implied Volatility Surface

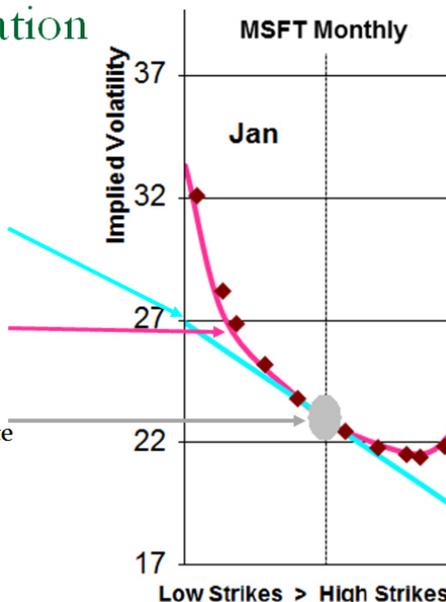
The other measurements a volatility forecaster needs to make are of the implied volatility surface. An implied volatility surface can be described as a 3-dimensional surface where the independent variables are time to expiration, and option delta and the dependent variable is implied volatility. To illustrate an implied volatility surface, we have developed a 2-dimensional graph that displays all three axes in the figure below. Summary information about this surface gives the trader a macro view of the implied volatilities for each option chain. ORATS takes a snapshot of all options on all symbols approximately 10 minutes before the close of trading. Options markets from this time are often of higher quality than at the close.

ORATS measures the surface using the following summary characteristics: at-the-money

volatility, strike slope, derivative, and earnings effect.

Implied Summarization

- Non-arbitrageable modified cubic spline initial curve
- Slope – steepness of the strike skew
- Derivative – curviness of the strike skew
- At-the-Money – very accurate implied volatility of the 50 delta



The “Smile”

At-the-money volatility is the implied volatility at the 50 delta call and put, or in other words, at the straddle. Strike Slope is a measure of the amount that implied volatility changes for every increase of 10 call delta points within the intra-month skew. It measures how lopsided the 'smile' or 'smirk' is. The derivative is a measure of the rate at which the strike slope changes for every increase of 10 call delta points within the intra-month skew. It measures the curvature of the intra-month skew or 'smile.' We chose just two parameters to describe the skew to get a reasonable fit for the fewest assumptions.

Using this method of describing the skew has the additional benefit of producing accurate at-the-money volatility readings important for summarizing the term structure.

Related Data Point(s): slp

infSlp

drv

infDrv

Forecasting the Implied Volatility Surface

These sophisticated methods of summarizing and manipulating the implied volatility surface allow us to compare summary characteristics across related equities and over time. These observations are then used in volatility forecasting models. In options trading, to find an edge, it is useful to compare implied volatility surface parameters and market values to forecasted parameters and to theoretical values computed using these parameters.

Related Data Point(s): or20dFcst

or20dFcstlv

orInfFcst

fcstSlp

infFcstSlp

fcstDrv

infFcstDrv

fcstR2

impFcstR2

impliedR2

Advanced: Calculating an Implied Volatility for Each Strike

Given the at-the-money implied volatility, the slope and the derivative, an implied volatility can be

calculated for each strike. First, a call delta is calculated for the strike using a standard option pricing model (not provided). Second, the slope and derivative for the expiration is calculated given the interpolated slope and derivative for that expiration. Third, the implied volatility formula is used to determine the strike implied.

Formula: $Atmiv * (1 + slope/1000 + (deriv/1000 * (delta * 100 - 50) / 2) * (delta * 100 - 50))$

For example, assume the following:

m1atmiv=30: slope=1:deriv=.1:delta=.75

Since we are finding the month 1 volatility the 30 day slope and derivative can be used.

$= 30 * (1 + (1/1000 + (0.1/1000 * (0.75 * 100 - 50) / 2)) * (0.75 * 100 - 50))$
 $= 31.688$

Example2, assume:

M2atmiv=32: slope=1:deriv=.08: slopeInf=2:derivInf=.08:delta=.25

In this example we first need to interpolate the slope and derivative between the 30 day and in the infinite. This is done by weighting the 30day * 71% and the infinite 29% (see below).

Slope: $= 0.71 * 1 + 0.29 * 2 = 1.293$

Derivative: $= 0.71 * .1 + 0.29 * .08 = 0.094$

Implied volatility at 25 delta:

$= 32 * (1 + (1.293/1000 + (0.059/1000 * (0.25 * 100 - 50) / 2)) * (0.25 * 100 - 50)) = 31.907$

Finding the weightings: The weighting for the 30 day is found by $1/\sqrt{\text{days to expiry of the desired month} / 365}$ divided by $1/\sqrt{30 \text{ day expiry} / 365}$ or: $= (1/\sqrt{60/365}) / (1/\sqrt{30/365}) = \sim .71$

The weighting for the infinite is the complement percentage of the 30day.

Assessing the First Earnings Month's IV

The first expiration after the earnings announcement is the most important for earnings traders. ORATS identifies the implied volatility of the first expiration and compares this to the following two IVs to assess under or overvalued. 1) Ex earnings implied volatility of the first expiration after earnings plus the implied earnings effect and 2)

The term structure of ATM IV are simultaneously solved with a short term and long term points, earnings effect added to months after earnings announcements, and a 45-day additional adjustment. After the term solve, the additional earnings effect on the months after earnings announcement are displayed.

Related Data Point(s): fairFrontlv

fairFrontlvXImpErnEffct

fairEx30dlvImpErnEffct

imp90dErnMv

imp90dMth2ErnMv

The Rip Value

When on the floor Matt Amberson noticed experienced traders paying more than theoretical value for certain low priced options. Also, these traders would not hedge all the theoretical deltas from these options. The options seemed to have a low price but would vary between stocks. I set out to define what this level was and the result was the Rip Value. The Rip Value is the value where traders would start to pay more for options and also start to take deltas out of their positions.

ORATS uses the Rip for these two methods and also as a trigger to exit options in the backtesting platform. The specific formula and implementation techniques can be had by contacting matt@orats.com.

Rip

Correlation to SPY and ETF

ORATS presents the correlation to the SPY and the related ETF for one month and one year.

Related Data Point(s): spy1mCorrel

spy1yCorrel

etf1mCorrel

etf1yCorrel

Beta to SPY

ORATS presents the traditional beta calculation of the stock to the SPY for one year.

Related Data Point(s): beta1m

beta1y

Percentile Analysis

It is useful to see where the current reading of a variable is in relation to a time series of observations. The percentile takes all the observations, sorts them, and makes an assessment of where the current reading is on that list. To calculate percentile, you sort the list of numbers. Then you find the number in question from the list and take that index and divided by the length of the list. So an example of getting the current percentile of IV = 15 from the list of [8,15,12,10,6,20,25,30]. Sort the list [6,8,10,12,15,20,25,30]. Find the index number IV= 15 in the list, which is 5th index. The percentile = $5 / 8 = 62.5\%$

Related Data Point(s): iv1mPctile

iv1yPctile

ivSpyPctile

ivEffPctile

iv1mPctile

iv1yPctile

ivSpyPctile

ivEffPctile

IV Ratios to SPY and ETF

It is useful to monitor the ratio of the stock implied volatility to the SPY and related ETF. ORATS presents the ratio and the average of the ratio over time and the standard deviation of the ratio.

Related Data Point(s): ivSpyRatio

ivAvg1mSpyRatio

ivAvg1ySpyRatio

ivStdev1ySpyRatio

ivEffRatio

ivAvg1mEffRatio

ivAvg1yEffRatio

ivStdev1yEffRatio

IV HV Ratios

Another important indicator is how the implied volatility is trading in relation to the historical volatility. It is useful to compare that ratio to the related ETF ratio to see if the ratio is high or low.

Related Data Point(s): ivAvg1mXErnHvRatio

ivAvg1yXErnHvRatio

ivStdev1yHvXErnRatio

etflvXErnHvRatio

etflvAvg1mHvXErnRatio

etflvAvg1yHvXErnRatio

etflvStdev1yXErnHvRatio

Residual Measurements from Put Call Parity

ORATS measurements of implied volatility include equating the call and put implied volatilities by solving for residual yield. Options pricing formulas use a risk-free yield and a dividend yield to produce a theoretical option value. ORATS holds the other inputs in the pricing formula and solves for the residual yield, the remaining yield after interest and dividends. Deconstructing residual yield produces approximations of the implied dividends and the implied borrow rate in market options prices.

Related Data Point(s): implied_next_div

ann_act_div

ann_idiv

error

confidence

Borrow Rate

This observation is calculated by averaging the following calculation performed for each strike that is traded for a specific underlying asset: Average of the call market bid ask prices minus the call theoretical value plus the average of the put market bid ask prices minus the put theoretical value. Theoretical values are computed using the following inputs: publicly announced inputs for interest and dividends; and volatility based on the implied volatility of the average of the market bid ask prices. Higher values for Borrow indicate that the option prices are implying that any or all of the following inputs are different than what is expected: interest, dividends, and hedge price.

Related Data Point(s): borrow30
borrow2yr

Earnings Announcement Historical Dates and Moves

ORATS presents the past 12 earnings dates and earnings information.

Related Data Point(s): ernDate1

Current Straddle Pricing

ORATS presents the current straddle pricing from the at-the-money options along with the strike used in pricing, and the theoretical prices from smoothed and forecasted volatility surfaces. As earnings announcement date nears, the current prices can be compared to historical dates the day before earnings.

Related Data Point(s): ernStraPct1
m1StraPx
m1SmoothStraPx
m1FcstStraPx
m1LoStrike

Other Research

It is often useful to eliminate potential and actual takeover targets from scanning and research. ORATS has methods for identifying potential targets and makes assessments whether it would serve our customers to include these stocks in the list. When identifying stocks on which to trade options, it is often important to consider liquidity. ORATS calculates the average option volume over the last 20 days.

Related Data Point(s): tkOver
avg20dOptVolu

4. Data Points

ORATS makes our data available to our backtesting service and through FTP, web services and other APIs.

General Core Data: Our popular General Core Data File delivers a summary of the following options information for all US listed option symbols.

GENERAL CORE	DESCRIPTION
ticker	Ticker Symbol
tradeDate	Trade Date of the current day for which the data applies.
assetType	Characterizes stock as easy-to-borrow (ETB), hard-to-borrow (HTB), dividend paying, stock ETF or Index with these codes: 0 - ETB_NO_DIV 1 - HTB 2 - HTB_DIV_PAYING 3 - ETB_DIV_PAYING 4 - INDEX 5 - ETF 6 - VIX_STYLE_EX 7 - ETF_QDIV_ON_EX 8 - ETF_MDIV_ON_EX 9 - INDEX_AMER_EX

clsStkPx	Closing price on the prior trading day.
atmIvStockPx	Stock price taken at time of IV calculation
mktCap	Market capitalization (shares outstanding * stock price) (in billions). * Note changed decimal from previous version.
cVolu	Today's call option volume for all strikes for the current trading day.
cOi	Total call open interest.
pVolu	Today's put option volume for all strikes.
pOi	Total put open interest.
or20dFcst	The ORATS forecast of stock volatility for the next 20 days based on data with earnings taken out. The forecasts of the next 20 trading days of statistical/historical volatility are developed using short term ex-earnings historical volatility; ex earnings implied volatility and the IV HV relationships, related ETF HV IV relationships.
or20dFcstIv	The ORATS forecast of implied volatility in 20 days with earnings taken out. Could be compared to ORATS 20d IV implied volatility. The forecasts of the implied volatility in 20 trading days are developed using ex-earnings historical volatility; ex earnings implied volatility and the IV HV relationships, related ETF HV IV relationships.
orInfFcst	The ORATS forecast of the infinite implied volatility. Could be compared to actual implied volatility or actual infinite. The forecasts of the two year implied volatility are developed using long term ex-earnings historical volatility, ex-earnings implied volatility and the IV HV relationships, related ETF HV IV relationships.
xErnOr20dIv	The 20 day interpolated implied option volatility with earnings effect taken out.
xErnOrInflv	Infinite implied option volatility.
iv200dMa	The 200 day moving average of the ORATS 20day ex-earn implied volatility.
m1AtmIv	Implied volatility for the first standard expiration.
m1AtmFitIv	The at-the-money monthly fit volatility for month 1 using the term structure of the forecast and the implied at-the-money volatility.
m1AtmFcstIv	Forecast of volatility for month 1 using the ex-earnings forecast plus the earnings effect at this days to expiration.
m1Dte	Days to expiration in month 1 standard expiration (not weekly or quarterly expirations).
m2AtmIv	Implied volatility for month 2.
m2AtmFitIv	The at-the-money monthly fit volatility for month 2.
m2AtmFcstIv	Forecast of volatility for month 2.

m2Dte	Days to expiration in month 2.
m3AtmIv	Implied volatility for month 3.
m3AtmFitIv	The at-the-money monthly fit volatility for month 3.
m3AtmFcstIv	Forecast of volatility for month 3.
m3Dte	Days to expiration in month 3.
m4AtmIv	Implied volatility for month 4.
m4AtmFitIv	The at-the-money monthly fit volatility for month 4
m4AtmFcstIv	Forecast of volatility for month 4.
m4Dte	Days to expiration in month 4.
iRate5wk	Short term risk-free interest rate from treasuries.
iRateLt	Long term risk-free interest rate from treasuries.
pxOf1000gam	The estimated cost of 1000 gamma per day for 30-day options.
volOfVol	Annualized standard deviation of daily (1day ORATS intraday vol) statistical volatility for one year.
volOfIv	Annualized standard deviation of the ORATS ex-earnings 30 day implied.
slp	The best-fit regression line through the strike volatilities adjusted to the tangent slope at the 50 delta. The slope is the change in the implied volatility for every 10 delta increase in the call delta.
infSlp	Implied infinite slope.
fcstSlp	The ORATS forecast of the slope of implied volatility skew. Could be compared to the actual slope.
infFcstSlp	Slope forecast infinite.
drv	Derivative or curvature of the monthly strikes at 30 day interpolated. The derivative is the change in the slope for every 10 delta increase in the call delta.
infDrv	Derivative infinite implied.
fcstDrv	Forecast derivative at 30 day interpolated.
infFcstDrv	Forecast infinite derivative.
mktWidthVol	Market width in implied vol points at the interpolated 30 days to expiration.
infMktWidthVol	Market width in implied vol points at the interpolated 2 years to expiration.
cAddPrem	Deprecated item.
pAddPrem	Deprecated item.
rip	The dollar amount of options to start ignoring in delta calculation.
earnReturnIv	Deprecated item.
fcstR2	The goodness of fit of the 20-day forecast to the 20-day future statistical volatility.

impFcstR2	The goodness of fit of the implied forecast vs actual implied in 20 days.
hiHedge	Deprecated item.
loHedge	Deprecated item.
stkVolu	Total stock volume for an underlyer.
avg20dOptVolu	The average for the last 20 days of total options volume for the symbol.
sector	The sector as derived by cusip number.
or1dHv	The 1-day historical intraday volatility.
or5dHv	The 5-day historical intraday volatility.
or10dHv	The 10-day historical intraday volatility.
or20dHv	The 20 day historical intraday volatility (20 observations).
or60dHv	The 60-day historical intraday volatility.
or90dHv	The 90-day historical intraday volatility.
or120dHv	The 120-day historical intraday volatility.
or252dHv	The 252-day historical intraday volatility.
or500dHv	The 500-day historical intraday volatility.
or1000dHv	The 1000 day historical intraday volatility.
cls5dHv	The 5-day historical close to close volatility.
cls10dHv	The 10-day historical close to close volatility.
cls20dHv	The 20-day historical close to close volatility.
cls60dHv	The 60-day historical close to close volatility.
cls90dHv	The 90-day historical close to close volatility.
cls120dHv	The 120-day historical close to close volatility.
cls252dHv	The 252-day historical close to close volatility.
cls500dHv	The 500-day historical close to close volatility.
cls1000dHv	The 1000 day historical close to close volatility.
iv20d	The 20 interpolated implied at-the-money volatility (calendar day).
iv30d	The 20 day interpolated implied volatility.
iv60d	The 60 day interpolated implied volatility.
iv90d	The 90 day interpolated implied volatility.
iv6m	The 6 month interpolated implied volatility.
cls1wkAgoStkPx	Stock price at the prior week (5 trading days ago).
chng1wkStkPx	Stock price change over the prior week (5 trading days).
cls1mAgoStkPx	Stock price at the prior month (21 trading days ago).
chng1mStkPx	Stock price change over the prior month (21 trading days).
cls6mAgoStkPx	Stock price at the prior 6 months (252/2) trading days ago.
chng6mStkPx	Stock price change over the prior 6 months (252/2) trading days.
cls1yAgoStkPx	Stock price at the prior year (252 trading days ago).
chng1yStkPx	Stock price change over the prior year (252 trading days).
divFreq	Number of dividends per year.
divYield	Annualized dividends divided by stock price.

divGrwth	The slope of the forecasted dividends annualized.
divDate	Next dividend date is available through another subscription.
divAmt	Dividend amount.
nextErn	Next earnings date is available through another subscription.
todNextErn	Deprecated item.
lastErn	Last earnings date
todLastErn	Time of day earnings released: Before-2, After-3, During-4, Unknown-1.
absAvgErnMv	Average Earnings Move percentage: an average of the absolute values of the stock price moves corresponding to the time of the next earnings announcement.
impErnEffct	Market implied earnings effect is found by solving for a term structure equation where the earnings effects adjust the months affected by earnings.
daysToNextErn	Deprecated item.
tkOver	0 - Not a takeover. 1 - A takeover or rumored takeover stock.
inclEtf	The ETFs where the symbol is a component pipe delimited if multiple.
bestEtf	The closest SPDR Sector ETF (default to SPY or RUT if none).
sectorName	SPDR short name of the sector.
spy1mCorrel	ORATS 30 day implied volatility ex-earnings (ORiv) correlation with SPY one month.
spy1yCorrel	ORATS 30 day implied volatility ex-earnings (ORiv) correlation with SPY one year.
etf1mCorrel	ORiv correlation with the Best ETF 30 day IV over the last month.
etf1yCorrel	ORiv correlation with the SPDR Sector ETF 30 day IV over the last year.
beta1m	Short term price beta with SPY for 30 calendar days.
beta1y	Long term price beta, 365 calendar days.
iv1mPctile	Percentile of the current ORiv vs. month range.
iv1yPctile	Percentile of the current ORiv vs. year range.
ivSpyPctile	Percentile of the current Oriv / SPY vs. year range.
ivEtfPctile	Percentile of the current ETF ORiv vs. year range.
ivMeanStdev	Number of stdevs the ORiv is away from mean for the year.
iv1yStdev	The standard deviation of the Oriv for the year.
ivSpyRatio	Oriv divided by SPY 30 day ORATS implied volatility.
ivAvg1mSpyRatio	Oriv divided by SPY 30 day ORATS implied volatility 30 day average.
ivAvg1ySpyRatio	Oriv divided by SPY 30 day ORATS implied volatility one year average.
ivStdev1ySpyRatio	Oriv divided by SPY 30 day ORATS implied volatility one year standard deviation.
ivEtfRatio	Oriv divided by ETF 30 day ORATS implied volatility.

ivAvg1mEtfRatio	Oriv divided by ETF 30 day ORATS implied volatility 30 day average.
ivAvg1yEtfRatio	Oriv divided by ETF 30 day ORATS implied volatility one year average.
ivStdev1yEtfRatio	Oriv divided by ETF 30 day ORATS implied volatility one year standard deviation.
ivXErnHvRatio	Oriv / HV20xErn Ratio.
ivAvg1mXErnHvRatio	Oriv / HV20xErn Ratio vs monthly average.
ivAvg1yXErnHvRatio	Oriv / HV20xErn Ratio vs yearly average.
ivStdev1yHvXErnRatio	Oriv / HV20xErn Ratio vs yearly range standard deviation.
etflvXErnHvRatio	Oriv / HV20xErn Ratio divided by ETF 30day implied / HV20d ratio.
etflvAvg1mHvXErnRatio	Oriv / HV20xErn Ratio divided by ETF 30day implied / HV20d ratio month average.
etflvAvg1yHvXErnRatio	Oriv / HV20xErn Ratio divided by ETF 30day implied / HV20d ratio year average.
etflvStdev1yXErnHvRatio	Oriv / HV20xErn Ratio divided by ETF 30day implied / HV20d ratio year standard deviation.
pctileSlp	The one-year percentile for the slope.
avg1mSlp	Slope average for trailing month.
avg1ySlp	Slope average for trailing year.
stdev1ySlp	Standard deviation of the Slope.
etfSlpRatio	Slope divided by ETF slope current.
etfAvg1mSlpRatio	Slope divided by ETF slope month average.
etfAvg1ySlpRatio	Slope divided by ETF slope year average.
etfsloperatioavgstd1y	Slope divided by ETF slope year standard deviation.
impliedr2**	The regression formula goodness of fit of the 30 day ORATS implied volatility to the 20 day future statistical ex-earnings volatility.
slope45**	The term structure slope of the 45 day implied volatilities ex-earnings effect.
nextdiv**	The next dividend amount.
impliednextdiv**	The next implied dividend given options prices put call parity.
annactdiv**	The annual dividend from the next year of expected dividends.
annidiv**	The annual implied dividend given options prices put call parity.
borrow30**	The implied hard-to-borrow interest rate at 30 days to expiration given options prices put call parity.
borrow2yr**	The implied hard-to-borrow interest rate at two years to expiration given options prices put call parity.
error**	The total weighted squared error times the confidence in the monthly implied volatility.

confidence**

tod**

** New this version

The total weighted confidence from the monthly implied volatilities derived from each month's number of options and bid ask width of the options markets.

Updated at this date and time.

Earnings Core Data: Important for stocks, the Earnings Core Data File delivers a summary of the following option information for all US listed option symbols.

EARNINGS CORE

ticker	Underlying symbol
tradeDate	Date of the skew reading for market prices.
clsStkPx	Underlying price at the last close.
wksNextErn	Deprecated. Requires earnings date subscription.
todNextErn	Time of day earnings released: Before=900, After=1630, During=1200, Unknown=2359.
ernMnth	Deprecated. Requires earnings date subscription.
avg20dOptVolu	The average option volume for all strikes over the last 20 days.
oi	Total open interest for all strikes.
m1Atmlv	The at-the-money implied volatility for month 1 interpolated using strikes weighted to at-the-money.
m1Dte	Days to expiration for month1.
m2Atmlv	The at-the-money implied volatility for month 2.
m2Dte	Days to expiration for month2.
m3Atmlv	The at-the-money implied volatility for month 3.
m3Dte	Days to expiration for month3.
m4Atmlv	The at-the-money implied volatility for month 4.
m4Dte	Days to expiration for month4.
m1StraPx	The straddle price for month1 closest to the money strikes.
m2StraPx	The straddle price for month2.
m1SmoothStraPx	The straddle ORATS smooth theo for month 1 based on a smoothed line through all strikes.
m2SmoothStraPx	The straddle ORATS smooth theo for month 2.
m1FcstStraPx	The straddle ORATS Forecast theo for month 1.
m2FcstStraPx	The straddle ORATS Forecast theo for month 2.
m1LoStrike	The low strike of the straddle or strangle for month 1.
m1HiStrike	The high strike of the straddle or strangle for month 1.
m2LoStrike	The low strike of the straddle or strangle for month 2.
m2HiStrike	The high strike of the straddle or strangle for month 2.
ernDate1	Historical earnings date back1.
ernDate2	Historical earnings date back2.
ernDate3	Historical earnings date back3.
ernDate4	Historical earnings date back4.
ernDate5	Historical earnings date back5.
ernDate6	Historical earnings date back6.
ernDate7	Historical earnings date back7.
ernDate8	Historical earnings date back8.
ernDate9	Historical earnings date back9.
ernDate10	Historical earnings date back10.

ernDate11	Historical earnings date back11.
ernDate12	Historical earnings date back12.
ernMv1	The percentage move for earnings date back1.
ernMv2	The percentage move for earnings date back2.
ernMv3	The percentage move for earnings date back3.
ernMv4	The percentage move for earnings date back4.
ernMv5	The percentage move for earnings date back5.
ernMv6	The percentage move for earnings date back6.
ernMv7	The percentage move for earnings date back7.
ernMv8	The percentage move for earnings date back8.
ernMv9	The percentage move for earnings date back9.
ernMv10	The percentage move for earnings date back10.
ernMv11	The percentage move for earnings date back11.
ernMv12	The percentage move for earnings date back12.
ernStraPct1	The earn straddle price as a percent of the stock price for earnings date number1.
ernStraPct2	The earn straddle price as a percent of the stock price for earnings date number2.
ernStraPct3	The earn straddle price as a percent of the stock price for earnings date number3.
ernStraPct4	The earn straddle price as a percent of the stock price for earnings date number4.
ernStraPct5	The earn straddle price as a percent of the stock price for earnings date number5.
ernStraPct6	The earn straddle price as a percent of the stock price for earnings date number6.
ernStraPct7	The earn straddle price as a percent of the stock price for earnings date number7.
ernStraPct8	The earn straddle price as a percent of the stock price for earnings date number8.
ernStraPct9	The earn straddle price as a percent of the stock price for earnings date number9.
ernStraPct10	The earn straddle price as a percent of the stock price for earnings date number10.
ernStraPct11	The earn straddle price as a percent of the stock price for earnings date number11.
ernStraPct12	The earn straddle price as a percent of the stock price for earnings date number12.
ernEffct1	The earn effect for earnings date number1.
ernEffct2	The earn effect for earnings date number2.
ernEffct3	The earn effect for earnings date number3.
ernEffct4	The earn effect for earnings date number4.
ernEffct5	The earn effect for earnings date number5.

ernEffct6	The earn effect for earnings date number6.
ernEffct7	The earn effect for earnings date number7.
ernEffct8	The earn effect for earnings date number8.
ernEffct9	The earn effect for earnings date number9.
ernEffct10	The earn effect for earnings date number10.
ernEffct11	The earn effect for earnings date number11.
ernEffct12	The earn effect for earnings date number12.
or5dHv	The 5-day historical intraday volatility.
or10dHv	The 10-day historical intraday volatility.
or20dHv	The 20 day historical intraday volatility (20 observations).
or60dHv	The 60-day historical intraday volatility.
or90dHv	The 90-day historical intraday volatility.
or120dHv	The 120-day historical intraday volatility.
or252dHv	The 252-day historical intraday volatility.
or500dHv	The 500-day historical intraday volatility.
or1000dHv	The 1000 day historical intraday volatility.
xErnOr5dHv	The 5-day historical intraday volatility excluding day of and after earnings (5 observations less day of or day after earnings if applicable).
xErnOr10dHv	The 10-day historical intraday volatility excluding day of and after earnings.
xErnOr20dHv	The 20-day historical intraday volatility excluding day of and after earnings.
xErnOr60dHv	The 60-day historical intraday volatility excluding day of and after earnings.
xErnOr90dHv	The 90-day historical intraday volatility day of and after earnings out.
xErnOr120dHv	The 120-day historical intraday volatility day of and after earnings out.
xErnOr252dHv	The 252-day historical intraday volatility day of and after earnings out.
xErnOr500dHv	The 500-day historical intraday volatility day of and after earnings out.
xErnOr1000dHv	The 1000 day historical intraday volatility day of and after earnings out.
cls5dHv	The 5 day historical close to close volatility.
cls10dHv	The 10 day historical close to close volatility.
cls20dHv	The 20 day historical close to close volatility (20 observations).
cls60dHv	The 60-day historical close to close volatility.
cls90dHv	The 90-day historical close to close volatility.
cls120dHv	The 120-day historical close to close volatility.
cls252dHv	The 252-day historical close to close volatility.
cls500dHv	The 500-day historical close to close volatility.

cls1000dHv	The 1000 day historical close to close volatility.
xErncls5dHv	The 5 day historical close to close volatility excluding day of and after earnings.
xErncls10dHv	The 10 day historical close to close volatility excluding day of and after earnings.
xErncls20dHv	The 20-day historical close to close volatility excluding day of and after earnings.
xErncls60dHv	The 60-day historical close to close volatility excluding day of and after earnings.
xErncls90dHv	The 90-day historical close to close volatility excluding day of and after earnings.
xErncls120dHv	The 120-day historical close to close volatility excluding day of and after earnings.
xErncls252dHv	The 252-day historical close to close volatility excluding day of and after earnings.
xErncls500dHv	The 500-day historical close to close volatility excluding day of and after earnings.
xErncls1000dHv	The 1000 day historical close to close volatility excluding day of and after earnings.
iv20d	The 20 interpolated implied volatility (20 calendar days).
iv30d	The 30 day interpolated implied volatility.
iv90d	The 90 day interpolated implied volatility.
iv6m	The 6 month interpolated implied volatility.
xErnOr20dlv	The ORATS short term implied volatility parameter solve of term structure at 30 calendar day with an 2 year IV parameter and earnings effect out.
xErnOrInflv	The ORATS long term implied volatility parameter solve of term structure at 2 year out with 30 calendar day parameter and earnings effect out.
slp	The put call slope at the interpolated 30 calendar days of the tangent at 50 delta.
fcstSlp	ORATS forecasted 30 calendar day put/call slope.
fcstErnEffct	ORATS forecasted earnings effect considers day of and day after earnings, seasonality, recentness, median and average of move divided by expected move.
absAvgErnMv	Absolute average percent earnings move 12 observations at the time of the historical earnings announcement.
stdevErnMv	The standard deviation of the 12 earnings moves absolute values.
impErnEffct	The implied earnings effect (percentage of expected normal move) to make the best-fit term structure of the month implied volatilities.

impErnMv	The percentage stock move in the implied earnings effect to make the best-fit term structure of the month implied volatilities.
impMth2ErnMv	[duplicated] The percentage stock move in the implied earnings effect to make the best-fit term structure of the month implied volatilities.
fair90dIv	The IV of the first earnings month.
fair90dIvXImpErnEffct	The smoothed term structure ex-earnings Ivs at the front earnings month plus the solved earnings effect.
fair90dIvMth2XImpErnEffct	The 30 calendar day interpolated implied volatility with earnings effect out plus the additional IV earnings effect from the first earnings month.
imp90dErnMv	The additional IV the front earnings month has over its ex-earnings IV. *New format in decimals.
imp90dMth2ErnMv	The additional IV the second earnings month has over its ex-earnings IV. *New format in decimals.
**iv10d	The 10 interpolated implied volatility (10 calendar days)
**iv60d	The 60 day interpolated implied volatility
**iv1yr	The one year interpolated implied volatility
**iv10dExErn	The implied 10 calendar day interpolated implied volatility with earnings effect out
**iv20dExErn	The implied 20 calendar day interpolated implied volatility with earnings effect out
**iv30dExErn	The implied 30 calendar day interpolated implied volatility with earnings effect out
**iv60dExErn	The implied 60 calendar day interpolated implied volatility with earnings effect out
**iv90dExErn	The implied 90 calendar day interpolated implied volatility with earnings effect out
**iv6mExErn	The implied 6 month interpolated implied volatility with earnings effect out
**iv1yrExErn	The implied one year interpolated implied volatility with earnings effect out
** New this release.	