

# CBOE

CHICAGO BOARD OPTIONS EXCHANGE

## Getting the Volatility Edge with XSP Options

presented by: The Options Institute at CBOE

# Disclaimer

In order to simplify the computations, commissions have not been included in the examples used in these materials. Commission costs will impact the outcome of all stock and options transactions and must be considered prior to entering into any transactions.

Any strategies discussed, including examples using actual securities and price data, are strictly for illustrative and educational purposes only and are not to be construed as an endorsement, recommendation, or solicitation to buy or sell securities.

Options involve risks and are not suitable for everyone. Prior to buying or selling an option, an investor must receive a copy of Characteristics and Risks of Standardized Options. Copies may be obtained from your broker or from The Chicago Board Options Exchange, 400 S. LaSalle, Chicago, IL 60605. Investors considering options should consult their tax advisor as to how taxes may affect the outcome of contemplated options transactions.

# Session Outline

- What are XSP options?
- Why bother?
- Volatility defined
- The meaning of “X% volatility”
- Finding the volatility edge

# What are XSP Options?

- Mini-SPX options
- Options on the S&P 500 Stock Index
- 1/10<sup>th</sup> the size of SPX options
- Trade like SPY options
  - Dollar strikes
  - Penny prices

# Why XSP Options?

- Cash settled
- European-style exercise
- 60-40 tax treatment

# Cash Settlement

- In-the-money options settled in cash
  - Option owners (long) receive cash
  - Option writers (short) pay cash
- No risk of portfolio disruption
- The last trading day is Thursday
  - Final settlement calculated Friday a.m.

# European-Style Exercise

- Cannot be exercised prior to expiration
  - (can be traded, but not exercised)
- No risk of the short option in a spread being assigned early

# “60-40” Tax Treatment

- Section 1256 Contracts: regardless of holding period, profits and losses are treated as 60% long-term and 40% short-term.
- Reported on Form 6781 and Schedule D
- Positions are “marked to market” at year end and taxed as if closed. Year-end prices become basis for next year.

\* According to [Taxes and Investing](#), published by The Options Industry Council, available from <http://www.cboe.com/LearnCenter/RCGeneral.asp>  
Note: IRS regulations may change. Seek professional tax advice.

# What is Volatility?

- A measure of “movement”
- Options are like insurance policies
- Volatility in options corresponds to risk in insurance
- A “bad” driver pays more for insurance.
- Options on a volatile index cost more.

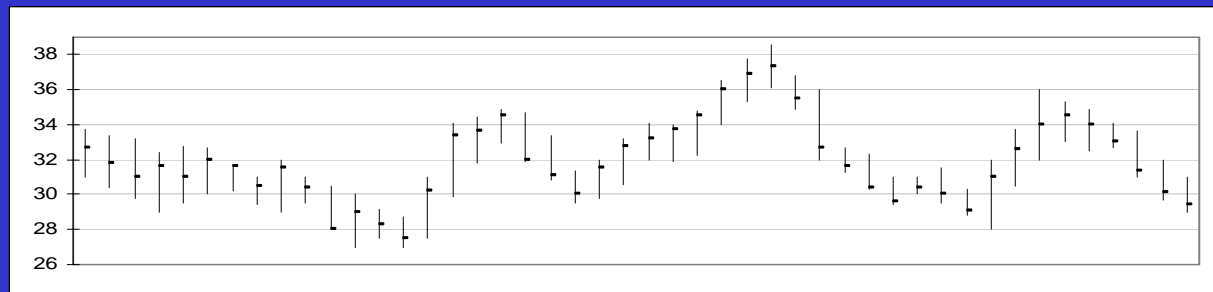
# Three Types of Volatility

- Historic
- Realized
- Implied

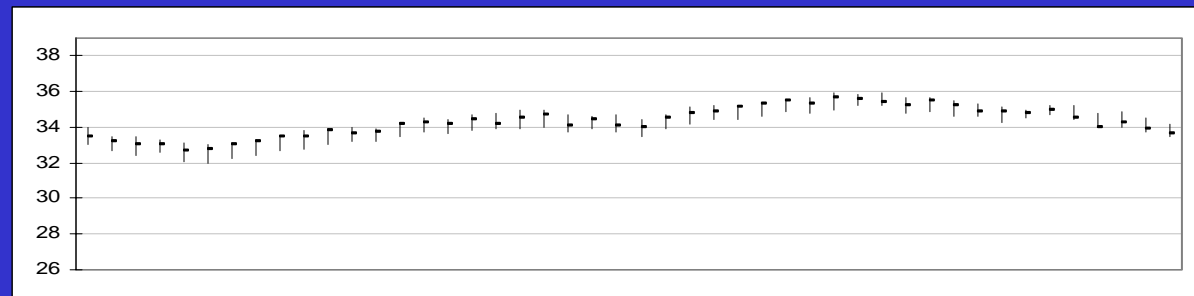
# Historic Volatility

- Stock price action in the past

High  
Volatility



Low  
Volatility



# Volatility and Index Options

- Assume each of the 500 stocks in the XSP trades at 35% volatility.
- What is the volatility of the XSP index?
- Higher than 35%? Lower than 35%?
- Why?

# Volatility and Index Options

- 3/26 XSP -1.19
  - 187 stocks up
  - 280 stocks down
  - 33 unchanged
- XSP Volatility 26% (lower than stocks)  
(Assumption: each stock in XSP trades at 35%)

# Realized Volatility

- Stock price action in the future
- Observe stock prices from today until some day in the future and use those prices to calculate historic volatility.
- Also called *future volatility*
- Realized volatility is unknown today.

# Implied Volatility

- The volatility percentage that justifies the market price of an option
- The volatility “in an option’s price”

# Calculating an Option's Value

XSP Index 132.20

Strike Price 134.00

Days to Exp 37

Interest Rates 4%

Dividends -0-

Volatility 22%

Theoretical Value  
of 134 Call

**3.10**

**OUTPUT**

**INPUTS**

# Calculating the Implied Volatility

Stock Price	132.20	}	}	<b>Market Price</b>			
Strike Price	134.00				<b>of 134 Call</b>		
Days to Exp	37					<b>3.80</b>	
Interest Rates	4%						<b>INPUTS</b>
Dividends	-0-						
Volatility	<b>26%</b>						

# Volatilities Change

XSP



H.V.  
&  
I.V.



Source: I-Volatility.com

# How Traders Use Volatility

- The volatility in an option's market price (implied volatility) can be used to estimate the market's expectation for the range of the underlying price between now and expiration.

# 30% Volatility – Its Meaning?

- 30% is the 1-year standard deviation
- In one year, an index at 100 today will be:
  - between 70 and 130 68% of the time
  - between 40 and 160 95% of the time
  - between 10 and 190 99% of the time

**An index level of \$250 in one year is not impossible – just unlikely.**

## Volatility - Underlying Price Range Expectations

<b>Implied Volatility</b>	<b>Days 30</b>	<b>Days 60</b>	<b>Days 90</b>
<b>15%</b>	<b>4.35%</b>	<b>6.13%</b>	<b>7.50%</b>
<b>20%</b>	<b>5.75%</b>	<b>8.17%</b>	<b>10.00%</b>
<b>25%</b>	<b>7.25%</b>	<b>10.21%</b>	<b>12.50%</b>
<b>30%</b>	<b>8.65%</b>	<b>12.26%</b>	<b>15.00%</b>
<b>35%</b>	<b>10.15%</b>	<b>14.30%</b>	<b>17.50%</b>
<b>40%</b>	<b>11.55%</b>	<b>16.34%</b>	<b>20.00%</b>
<b>45%</b>	<b>13.00%</b>	<b>18.38%</b>	<b>22.50%</b>
<b>50%</b>	<b>14.45%</b>	<b>20.43%</b>	<b>25.00%</b>
<b>55%</b>	<b>15.90%</b>	<b>22.47%</b>	<b>27.50%</b>

# Converting the 1-Year Std. Dev.

Formula:

Stock Price  $\times$  I.V.  $\times$  sqr root of time in yrs

$$\frac{\text{Stock Price} \times \text{I.V.} \times \sqrt{\text{Days to Exp}}}{\sqrt{\text{Days per year}}}$$

## Converting the 1-Year Std. Dev.

Stock Price                    134.00

Days to Exp                    28

Implied Volatility            26%

$$\frac{\text{Stock Price} \times \text{I.V.} \times \sqrt{\text{Days to Exp}}}{\sqrt{\text{Days per year}}}$$

$$\frac{134.00 \times .26 \times \sqrt{28}}{\sqrt{365}} = 9.67$$

## I.V. – What the Market Thinks

- XSP at 134 with I.V. at 26%
- The market thinks there is a 68% chance that XSP will be between 124.33 and 143.67 ( $\pm 1$  Std Dev) in 28 days .
- and a 95% chance XSP will be between 114.66 and 153.34 ( $\pm 2$  Std Dev).

# Calendar Days or Trading Days?

- The difference is minimal.
- Calendar days are easier to get.
- For less than 7 days, use trading days.
- The standard deviation calculation is only a guide. The market forecast is most important.

## I.V. – One More Statistic

- There is a 50% chance the underlying will touch 1 std dev (up or down) between now and expiration.
- XSP at 134 – I.V. at 26% – 28 days
- There is a 50% chance that XSP will touch 124.33 or 143.67 within 28 days

## Using I.V.

- Sell options that are 1 Std Dev O-O-M?
- Buy options and have a 1 Std Dev price target for the underlying?
- Choose strategies by combining technical and fundamental analysis with price ranges implied by option imp. vol.

# Selling Options “All the Time”

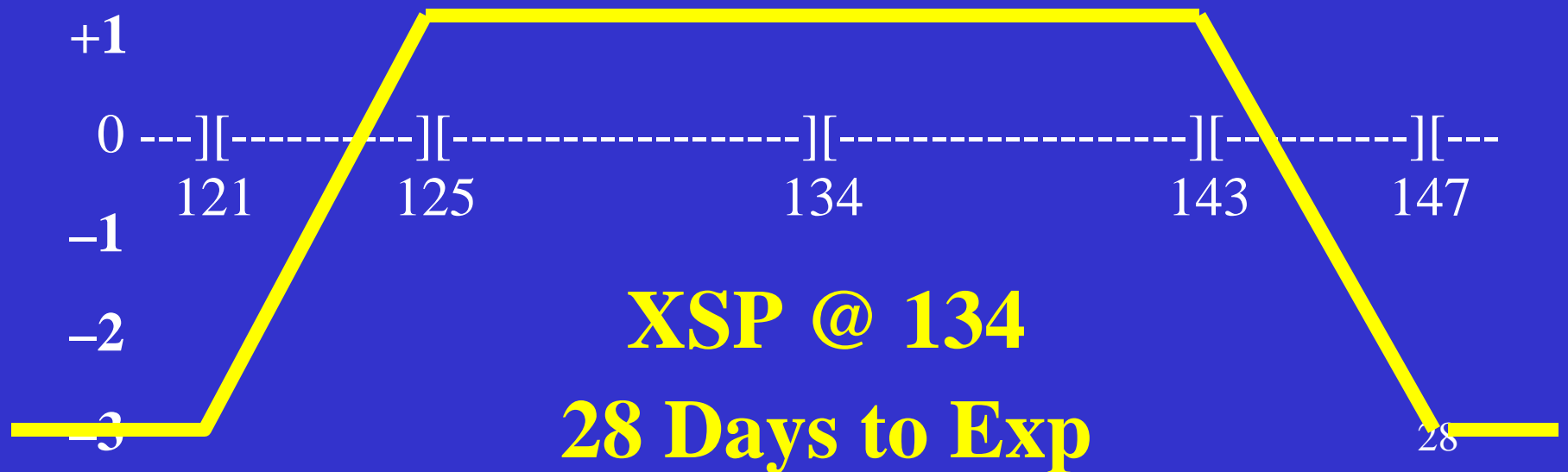
- Iron Condor:

Credit Call Spread + Credit Put Spread

Short 125 Put    0.85      Short 143 Call    1.15

Long 121 Put    0.35      Long 147 Call    0.60

Credit Spread    0.50      Credit Spread    0.55



# Selling Options “All the Time”

- Strategy:
  - Sell iron condors every month
  - Short strike is 1 Std Dev O-O-M
- What will happen over time?

# Selling Options “All the Time”

- Approximately 50% of the time.....
- The index will touch one short strike.
- You will be scared!
- Approximately 30% of the time.....
- The index will move 2 Std. Dev.

**To cover, or not to cover –  
that is the question!**

# What About Buying Options?

- Need a directional forecast
- Time decay is now your enemy
- 2 approaches:

Buy calls (or puts)

Buy vertical spreads

## Case Study 1 – Constant I.V.

- XSP at 132.20      21 days to expiration
- You predict at 4-point rise this week.
- The 134 Call is: 3.00 bid – 3.10 ask  
I.V. 29% – 30%
- Estimated profit if the forecast is right?

# Case Study 1 – Constant I.V.

XSP	132.20		136.20
Days to Exp	21		14
134 Call bid	3.00	29%	4.40 29%
ask	3.10	30%	4.50 30%

Estimated profit: **+1.30**

## Case Study 1 – Changing I.V.

- XSP at 132.20      21 days to expiration
- You predict at 4-point rise this week.
- The 134 Call is: 3.00 bid – 3.10 ask

I.V. 29% – 30%

- Profit if volatility drops to 25%?

# Case Study 1 – Changing I.V.

XSP	132.20		136.20
Days to Exp	21		14
134 Call bid	3.00	29%	<b>4.00</b> 25%
ask	<b>3.10</b>	30%	<b>4.10</b> 26%

Estimated profit: **+0.90 vs. +1.30**

## Case 1 – Changing I.V. & More Time

- XSP at 132.20      21 days to expiration
- You predict at 4-point rise in 2 weeks.
- The 134 Call is: 3.00 bid – 3.10 ask

I.V. 29% – 30%

- Profit if more time & volatility drops?

# Case 1 – Changing I.V. & More Time

XSP	132.20		136.20
Days to Exp	21		7
134 Call bid	3.00	29%	3.20 25%
ask	3.10	30%	3.30 26%

Estimated profit: **+0.10 vs. +1.30**

# Case 1 - Observations

Option traders need a 3-part forecast.

Price of the underlying

Time period

Level of implied volatility

## Case Study 2 – Debit Call Spread

- XSP at 132.20      21 days to exp
- 130 Call      5.00 – 5.10      29% – 30%
- 136 Call      2.20 – 2.30      29% – 30%

What is your bid for the 130-136 spread?

**The “natural offer” is 2.90**

**Bid 2.85**

**The “natural bid” is 2.70**

## Case Study 2 – Debit Call Spread

XSP	132.20	136.20
Days to Exp	21	14
130-136 Spread	2.85	<b>+3.85</b>
Estimated profit:	<b>+1.00</b>	

## Case Study 2 – Debit Call Spread

XSP	132.20	136.20
Days to Exp	21	14
130-136 Spread	2.85	<b>4.05</b>

Estimated profit: **+1.20** vs. **1.00**

**Implied Volatility drops to 25%**

## Case Study 2 – Debit Call Spread

XSP	132.20	136.20
Days to Exp	21	7
130-136 Spread	2.85	<b>4.40</b>

Estimated profit: **+1.55** vs. **1.00**

**I.V. drops to 25% & More Time**

## Case 2 - Observations

- Debit spreads have lower deltas.
- Debit call spreads are less sensitive to changes in implied volatility than outright long or short options (lower vega).
- More time helps debit call spreads.

# Summary – 1

- XSP Options: Cash settled, European style exercise, 60-40 tax treatment
- 3 Types of Volatility

Historical – Realized – Implied

## Summary – 2

- Implied volatility is an indication of what the market expects the underlying price range to be.
- Annual std dev can be converted

$$\frac{\text{Stock Price} \times \text{I.V.} \times \sqrt{\text{Days to Exp}}}{\sqrt{\text{Days per year}}}$$

## Summary – 3

- Option traders need a 3-part forecast  
Underlying Price – Time – Imp. Vol.
- Spreads are...
  - less sensitive to price (low delta)
  - less sensitive to changing I.V.

# Thank You for Attending

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