Disclosures

✓ Options trading entails significant risk and is not appropriate for all investors. Certain complex options strategies carry additional risk. Before trading options, please read Characteristics and Risks of Standardized Options, and call 800-544-5115 to be approved for options trading. Supporting documentation for any claims, if applicable, will be furnished upon request.

✓ Examples in this presentation do not include transaction costs (commissions, margin interest, fees) or tax implications, but they should be considered prior to entering into any transactions.

✓ The information in this presentation, including examples using actual securities and price data, is strictly for illustrative and educational purposes only and is not to be construed as an endorsement, recommendation.
Goals of Today’s Webinar

In today’s webinar we will cover:
- Researching Earnings
- What Implied Volatility is and how it impacts your trade
- Options Strategies that can be used for earnings plays
- How to estimate expected moves for earnings announcements
Historical vs. Implied volatility

Historical volatility (HV)

- Uses *actual* pricing data over the specified period
- Measure of *realized* volatility
- Can be gauged by looking at a price chart
- Based on number of trading days – i.e. HV20 includes 20 trading days worth of data
Historical vs. Implied volatility

- Implied volatility (IV)
  - Derived from the option contract prices on the given security
  - Measure of *expected* movement
  - Based on calendar days for a theoretical option i.e. IV30 is for 30 calendar days.

- Volatility is both an *input* for, and an *output* from, option theoretical pricing models such as Black Sholes, Bi-Nomial, and others
  - HV is considered when pricing the initial IV in the contract
  - Estimate of IV can be derived by working backwards through the formula since the option’s price and all other components are known
Implied Volatility

- Measures what the market “expects” volatility of the security to be in the future, based on premiums for option contracts on that security
- Annualized percentage for future expected move
- Dynamic - will change with option prices based on supply and demand for contracts

<table>
<thead>
<tr>
<th>VOLATILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV30 62.35</td>
</tr>
<tr>
<td>HV10 28.05</td>
</tr>
</tbody>
</table>

62.35% annualized expected move based on hypothetical 30 day option contracts

Image shows volatility data from the option statistics tool in Active Trader Pro
Implied Volatility

IV is a product of supply and demand for option contracts, and therefore has an affect on option prices. It can be a measure of relative expensiveness.

Higher expected move in the security

Higher demand for option contracts

Higher implied volatility (IV)

More expensive premiums

How can you determine whether a specific stock’s IV is relatively expensive (or inexpensive?)

IV percentile shows where a specific stock’s IV is compared to where its been within the last 52 weeks.

IV percentile can be found in the option statistics feature on ATP.
Implied Volatility

How can you determine whether a specific stock’s IV is relatively expensive (or inexpensive)?

IV index chart compares historical volatility (HV) with implied volatility (IV) over the last year.

- Helps to compare current volatility data with historical data to identify potentially high or low levels.
- Allows traders to identify divergence and convergence between HV and IV.
- Quick way to find when volatility measures could be at extremes and may revert to their mean values.

IV Index chart can be found in the option research section on Fidelity.com.
**Implied Volatility**

*Trader's point of view:* It’s important to remember each option contract has its own IV. Traders will often look at the IV’s of different expiration dates to see the impact of an event like earnings. The earnings date on this example is 2/25/16.

<table>
<thead>
<tr>
<th>Strike</th>
<th>Last</th>
<th>Chg</th>
<th>Bid</th>
<th>Ask</th>
<th>Volume</th>
<th>Open Int</th>
<th>Theta</th>
<th>IV Mid</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feb 26 CALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>11.84</td>
<td>3.54</td>
<td>11.55</td>
<td>11.95</td>
<td>42</td>
<td>869</td>
<td>-0.5852</td>
<td>92.68%</td>
<td>0.6357</td>
</tr>
<tr>
<td>162.5</td>
<td>10.15</td>
<td>3.24</td>
<td>10.10</td>
<td>10.45</td>
<td>40</td>
<td>365</td>
<td>-0.6019</td>
<td>91.93%</td>
<td>0.5906</td>
</tr>
<tr>
<td><strong>165</strong></td>
<td><strong>8.90</strong></td>
<td><strong>3.00</strong></td>
<td><strong>8.90</strong></td>
<td><strong>9.10</strong></td>
<td><strong>538</strong></td>
<td><strong>1,171</strong></td>
<td><strong>-0.6159</strong></td>
<td><strong>92.09%</strong></td>
<td><strong>0.5443</strong></td>
</tr>
<tr>
<td>167.5</td>
<td>7.70</td>
<td>3.19</td>
<td>7.60</td>
<td>7.70</td>
<td>160</td>
<td>371</td>
<td>-0.6067</td>
<td>90.19%</td>
<td>0.497</td>
</tr>
<tr>
<td>170</td>
<td>6.55</td>
<td>3.19</td>
<td>6.50</td>
<td>6.60</td>
<td>3,327</td>
<td>2,140</td>
<td>-0.5981</td>
<td>89.73%</td>
<td>0.4501</td>
</tr>
<tr>
<td><strong>Mar 04 CALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>10.70</td>
<td>1.50</td>
<td>12.35</td>
<td>13.00</td>
<td>14</td>
<td>88</td>
<td>-0.3258</td>
<td>73.82%</td>
<td>0.627</td>
</tr>
<tr>
<td>162.5</td>
<td>10.64</td>
<td>2.04</td>
<td>11.00</td>
<td>11.40</td>
<td>23</td>
<td>61</td>
<td>-0.3334</td>
<td>73.01%</td>
<td>0.5853</td>
</tr>
<tr>
<td><strong>165</strong></td>
<td><strong>9.95</strong></td>
<td><strong>2.55</strong></td>
<td><strong>9.70</strong></td>
<td><strong>10.00</strong></td>
<td><strong>25</strong></td>
<td><strong>320</strong></td>
<td><strong>-0.3352</strong></td>
<td><strong>72.13%</strong></td>
<td><strong>0.5447</strong></td>
</tr>
<tr>
<td>167.5</td>
<td>8.47</td>
<td>1.62</td>
<td>8.40</td>
<td>8.80</td>
<td>1</td>
<td>141</td>
<td>-0.3343</td>
<td>71.49%</td>
<td>0.5023</td>
</tr>
<tr>
<td>170</td>
<td>7.00</td>
<td>1.50</td>
<td>7.20</td>
<td>7.60</td>
<td>56</td>
<td>116</td>
<td>-0.3275</td>
<td>70.43%</td>
<td>0.4592</td>
</tr>
<tr>
<td><strong>Mar 18 CALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>16.55</td>
<td>3.15</td>
<td>16.70</td>
<td>17.25</td>
<td>85</td>
<td>1,657</td>
<td>-0.1726</td>
<td>59.55%</td>
<td>0.6904</td>
</tr>
<tr>
<td>160</td>
<td>13.85</td>
<td>2.82</td>
<td>13.75</td>
<td>14.00</td>
<td>148</td>
<td>1,789</td>
<td>-0.1842</td>
<td>58.99%</td>
<td>0.6209</td>
</tr>
<tr>
<td><strong>165</strong></td>
<td><strong>11.15</strong></td>
<td><strong>2.80</strong></td>
<td><strong>10.95</strong></td>
<td><strong>11.20</strong></td>
<td><strong>263</strong></td>
<td><strong>1,476</strong></td>
<td><strong>-0.1883</strong></td>
<td><strong>57.67%</strong></td>
<td><strong>0.5477</strong></td>
</tr>
<tr>
<td>170</td>
<td>8.10</td>
<td>2.10</td>
<td>8.50</td>
<td>8.70</td>
<td>306</td>
<td>1,637</td>
<td>-0.1857</td>
<td>56.61%</td>
<td>0.4722</td>
</tr>
<tr>
<td>175</td>
<td>6.50</td>
<td>2.05</td>
<td>6.40</td>
<td>6.65</td>
<td>602</td>
<td>1,592</td>
<td>-0.175</td>
<td>55.18%</td>
<td>0.396</td>
</tr>
</tbody>
</table>
Impact on Option Prices

**Q: Which option Greek measures the impact of implied volatility (IV) changes on an option contract’s value?**

**A: Vega** estimates the amount an option contract will change due to a 1% move in IV

*Let’s look at an example...*

**Vega = .0535**

Theoretically, the option will make $5 per contract with each 1% move up in IV, and lose $5 per contract with each 1% move down in IV.

**Example:**

You are predicting a 8% drop in IV after an earnings announcement.

\[-8 \times .0535 \times 100 = -\$42.80 / \text{contract}\]

You are expecting the contract price to go from 2.83 to 2.40 (2.83 - .428) resulting in a loss of $42.80 from the 8% IV drop, if everything else remained constant.
Long ATM Call

Long Call:

Cost: $1.81 * 100 shares = $181

Maximum Gain = Unlimited

Maximum Loss = $181
Long ATM Put

Long Put:

Cost: 1.88 * 100 shares = $188

Maximum Gain = $65.00 - $1.88 = $63.12 * 100 shares = $6,312

Maximum Loss = $188
# Long Straddle

Cost: $1.81 + $1.88 = $3.69 * 100 shares = $369

Maximum Gain = Unlimited

Maximum Loss = $369
Short Straddle

Credit: $1.69 + $1.85 = $3.54 * 100 shares = $354

Maximum Gain = $354

Maximum Loss = Unlimited
What Happened? Long Call

Long Call:
Cost: $1.81 * 100 shares = $181
Maximum Gain = Unlimited
Maximum Loss = $181

Results:
Value: $0.04 * 100 shares = $4
Gain/Loss = $0.04 - $1.81 = - 1.77 * 100 = $177
What Happened? Long Put

### Long Put:
- Cost: $1.88 * 100 shares = $188
- Maximum Gain = $6,312
- Maximum Loss = $188

### Results:
- Value: $2.77 * 100 shares = $277
- Gain/Loss = $2.77 - $1.88 = $0.89 * 100 = $89

<table>
<thead>
<tr>
<th>Strike</th>
<th>Last</th>
<th>Chg</th>
<th>Bid</th>
<th>Ask</th>
<th>Volume</th>
<th>Open Int</th>
<th>Vega</th>
<th>IV Mid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 24 PUTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>1.44</td>
<td>-0.15</td>
<td>1.29</td>
<td>1.40</td>
<td>3,548</td>
<td>471</td>
<td>0.0186</td>
<td>92.25 %</td>
</tr>
<tr>
<td>64.5</td>
<td>1.59</td>
<td>-0.22</td>
<td>1.48</td>
<td>1.68</td>
<td>968</td>
<td>647</td>
<td>0.0191</td>
<td>92.67 %</td>
</tr>
<tr>
<td><strong>65</strong></td>
<td><strong>1.88</strong></td>
<td><strong>-0.18</strong></td>
<td><strong>1.85</strong></td>
<td><strong>1.88</strong></td>
<td><strong>842</strong></td>
<td><strong>311</strong></td>
<td>0.0193</td>
<td><strong>94.38 %</strong></td>
</tr>
<tr>
<td>65.5</td>
<td>2.05</td>
<td>-0.25</td>
<td>1.97</td>
<td>2.22</td>
<td>122</td>
<td>112</td>
<td>0.0192</td>
<td>92.21 %</td>
</tr>
<tr>
<td>66</td>
<td>2.38</td>
<td>-0.24</td>
<td>2.19</td>
<td>2.48</td>
<td>135</td>
<td>63</td>
<td>0.0188</td>
<td>89.35 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strike</th>
<th>Last</th>
<th>Chg</th>
<th>Bid</th>
<th>Ask</th>
<th>Volume</th>
<th>Open Int</th>
<th>Vega</th>
<th>IV Mid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 24 PUTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>1.98</td>
<td>0.54</td>
<td>1.85</td>
<td>2.02</td>
<td>2,569</td>
<td>3,606</td>
<td>0.0041</td>
<td>32.27 %</td>
</tr>
<tr>
<td>64.5</td>
<td>2.40</td>
<td>0.81</td>
<td>2.10</td>
<td>2.50</td>
<td>69</td>
<td>721</td>
<td>0.0063</td>
<td>41.39 %</td>
</tr>
<tr>
<td><strong>65</strong></td>
<td><strong>2.67</strong></td>
<td><strong>0.79</strong></td>
<td><strong>2.77</strong></td>
<td><strong>2.99</strong></td>
<td><strong>134</strong></td>
<td><strong>878</strong></td>
<td>0.0062</td>
<td><strong>33.23 %</strong></td>
</tr>
<tr>
<td>65.5</td>
<td>3.67</td>
<td>1.62</td>
<td>3.00</td>
<td>3.65</td>
<td>7</td>
<td>186</td>
<td>0.0077</td>
<td>58.22 %</td>
</tr>
<tr>
<td>66</td>
<td>3.90</td>
<td>1.52</td>
<td>3.55</td>
<td>4.00</td>
<td>7</td>
<td>159</td>
<td>0.0053</td>
<td>46.86 %</td>
</tr>
</tbody>
</table>
What Happened? Long Straddle

**Long Straddle:**
Cost: $369
Maximum Gain = Unlimited
Maximum Loss = $369

**Results:**
Value: $0.04 + $2.77 = $2.81 * 100 shares = $281
Gain/Loss = $2.81 - $3.69 = $0.88 * 100 = $(88)
What Happened? Short Straddle

Short Straddle:
Credit: $354
Maximum Gain = $354
Maximum Loss = Unlimited

Results:
Value: $0.05 + $2.99 = $3.04 * 100 shares = $304
Gain/Loss = $3.54 - $3.04 = $0.54 * 100 = $54
# Volatility Crush and Vega

## Volatility on the Calls:
- IV Mid was 92.88% with Vega at $0.0193
- IV Mid ended up at 49.69%
- Option Value Lost due to Volatility = 92.88\% - 49.69\% = 43.19\% * $0.0193 = about $0.83

## Volatility on the Puts:
- IV Mid was 94.38% with Vega at $0.0193
- IV Mid ended up at 33.23%
- Option Value Lost due to Volatility = 94.38\% - 33.23\% = 61.15\% * $0.0193 = about $1.18
## Buying an Iron Condor

<table>
<thead>
<tr>
<th>CALLS</th>
<th>PUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>Change</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>5.15</td>
<td>0.00</td>
</tr>
<tr>
<td>5.11</td>
<td>0.00</td>
</tr>
<tr>
<td>4.22</td>
<td>0.00</td>
</tr>
<tr>
<td>4.15</td>
<td>0.00</td>
</tr>
<tr>
<td>3.70</td>
<td>0.00</td>
</tr>
<tr>
<td>3.45</td>
<td>0.00</td>
</tr>
<tr>
<td>2.82</td>
<td>0.00</td>
</tr>
<tr>
<td>2.75</td>
<td>0.00</td>
</tr>
<tr>
<td>2.34</td>
<td>0.00</td>
</tr>
<tr>
<td>2.08</td>
<td>0.00</td>
</tr>
<tr>
<td>1.81</td>
<td>0.00</td>
</tr>
<tr>
<td>1.55</td>
<td>0.00</td>
</tr>
<tr>
<td>1.29</td>
<td>0.00</td>
</tr>
<tr>
<td>1.15</td>
<td>0.00</td>
</tr>
<tr>
<td>0.93</td>
<td>0.00</td>
</tr>
<tr>
<td>0.75</td>
<td>0.00</td>
</tr>
<tr>
<td>2.21</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Trade:
- Sell $62 Put for $0.62
- Buy $64 Put for $1.40
- Buy $66 Call for $1.38
- Sell $68 Call for $0.55

### Cost:
- Maximum Gain: $2.00 - $1.61 = $0.39
- Maximum Loss: $1.61
Selling an Iron Condor

Trade:
Buy $62 Put for $0.72
Sell $64 Put for $1.29
Sell $66 Call for $1.15
Buy $68 Call for 0.65

Credit:$1.07
Maximum Gain: $1.07
Maximum Loss: $2.00-$1.07=$0.93
What Happened? Long Iron Condors

<table>
<thead>
<tr>
<th>Strike</th>
<th>Action</th>
<th>Last</th>
<th>Change</th>
<th>Bid</th>
<th>Ask</th>
<th>Volume</th>
<th>Open Int</th>
<th>Imp Vol</th>
<th>Vega</th>
<th>Strike</th>
<th>Action</th>
<th>Last</th>
<th>Change</th>
<th>Bid</th>
<th>Ask</th>
<th>Volume</th>
<th>Open Int</th>
<th>Imp Vol</th>
<th>Vega</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td></td>
<td>-0.70</td>
<td>0.00</td>
<td>0.82</td>
<td>0.72</td>
<td>2.081</td>
<td>93.18%</td>
<td>0.0152</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td></td>
<td>-0.70</td>
<td>0.00</td>
<td>0.82</td>
<td>0.72</td>
<td>2.081</td>
<td>93.18%</td>
<td>0.0152</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Result:
Value: $0.83 * 100 shares = $83
Gain/Loss: $0.83 - $1.61 = $(78)

Cost: $1.61
Maximum Gain: $2.00 - $1.61 = $0.39
Maximum Loss: $1.61

Fidelity Investments
What Happened? Short Iron Condors

Cost: $1.07 (Credit Received)
Maximum Gain: $1.07
Maximum Loss: $0.93

Result:
Value: $0.99 * 100 shares = $99
Gain/Loss: $1.07 - $0.99 = $8
Expected move calculation
A lot of traders will convert the annualized expected move into daily expected move or expected move until expiration using the following formula:

\[
\text{One standard deviation move} = \frac{\text{Stock Price} \times \text{Implied Volatility} \times \sqrt{\text{Days to expiry}}}{\sqrt{\text{Trading Days in a year}}} 
\]

Let's take the previous example and convert it to daily expected move...

Stock price = $100
IV = 20%
Sq. root of trading days in a year = approx. 16

\[
\frac{100 \times 0.20 \times 1}{16} \text{ + or (-)} \approx 1.25
\]

Trader's View:
Something helpful to remember is 16% IV results in a 1% daily expected move
For example: Stock price = $100 IV = 16%
\[
\frac{100 \times 0.16 \times 1}{16} = +/(-)$1
\]
Key Takeaways

- Fidelity.com offers research to help develop an outlook on an earnings report.
- Know what you’re trading: Implied Volatility and the Volatility Crush can have significant impacts on your trades.
- No trade is perfect, every trade has a trade-off.
- Have a plan: Understanding the risks that you are willing to take and the impacts of various factors, can help you to plan your trade more effectively and manage your overall expectations.
This concludes today’s presentation.

Thank you for attending.

Please join the Trading Strategy Desk for our upcoming webinars:

- April 21st – Advanced time spread trading – Using volatility skew for edge
- April 26th – New approaches to stock research

To Register, please visit the Fidelity.com Learning Center
https://www.fidelity.com/learning-center

For additional support, please contact a Fidelity representative at (877) 907-4429.