



# Time and Diagonal Spreads

All you wanted to know, but were afraid to ask



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Time Spread Defined

Three Ways to Trade Time Spreads:

Non-Directional, Directional, High Volatility

Theory vs. Reality

Diagonal Spreads

The simultaneous purchase of one option and sale of another option.

The options:

- are the same type (calls or puts)

- have the same strike price

- have the same underlying

- have **different expiration dates.**

Long Time Spread:

Sell Oct 90 Calls, Buy Nov 90 Calls

Short Time Spread:

Buy Oct 90 Calls, Sell Nov 90 Calls

XSP @ 89.00. You expect the index to be unchanged at 89.00 at October expiration.

28 days to October expiration

56 days to November expiration

Buy an at-the-money time spread (90 Strike).

Concept: the one-month option will decline more rapidly than the two-month option.

Buy the Nov-Oct 90 Time Spread

Buy 1 Nov 90 XSP Call @ (4.20)

Sell 1 Oct 90 XSP Call @ 2.85

Net Cost of Spread: (1.35)

XSP @ 89.00

28 days to Oct exp; 56 days to Nov.

# Low Volatility – P/(L) Est.

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 89.00       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (2.85)      |
| (S) Oct 90 Call | <u>2.85</u> | → | <u>0.00</u> |
| Time Spread     | (1.35)      | → | (2.85)      |

XSP @ 89.00    You expect the index  
to rise to 95 at October exp.

28 days to October expiration

56 days to November expiration

Buy an out-of-the-money time spread (95 Strike).

Concept: the one-month option will decline and  
the two-month option will rise.

## Buy the Nov-Oct 95 Time Spread

Buy 1 Nov 95 XSP Call @ (2.40)

Sell 1 Oct 95 XSP Call @ 1.20

Net Cost of Spread: (1.20)

XSP @ 89.00

28 days to Oct exp; 56 days to Nov.

# Directional View – P/(L) Est.

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | ➔ | 95.00       |
| Days to Oct Exp | 28          | ➔ | 0           |
| (L) Nov 95 Call | (2.40)      | ➔ | (3.50)      |
| (S) Oct 95 Call | <u>1.20</u> | ➔ | <u>0.00</u> |
| Time Spread     | (1.20)      | ➔ | (3.50)      |

XSP @ 89.00. You expect the index to be to  
rise or fall 10% at October expiration.

28 days to October expiration

56 days to November expiration

Sell an at-the-money time spread (89 Strike).

Concept: Both options will go to parity, and  
the profit will equal the credit received.

Sell the Nov-Oct 89 Time Spread

Sell 1 Nov 89 XSP Call @ 4.65

Buy 1 Oct 89 XSP Call @ (3.30)

Net Credit for Spread: 1.35

XSP @ 89.00

28 days to Oct exp; 56 days to Nov.

# High Volatility – Market Up

|                 |               |   |               |
|-----------------|---------------|---|---------------|
| XSP Index       | 89.00         | → | 98.00         |
| Days to Oct Exp | 28            | → | 0             |
| (S) Nov 89 Call | 4.65          | → | 9.65          |
| (L) Oct 89 Call | <u>(3.30)</u> | → | <u>(9.00)</u> |
| Time Spread     | 1.35          | → | 0.65          |

# High Volatility – Market Down

|                 |               |   |               |
|-----------------|---------------|---|---------------|
| XSP Index       | 89.00         | → | 80.00         |
| Days to Oct Exp | 28            | → | 0             |
| (S) Nov 89 Call | 4.65          | → | 0.50          |
| (L) Oct 89 Call | <u>(3.30)</u> | → | <u>(0.00)</u> |
| Time Spread     | 1.35          | → | 0.50          |

Neutral market view (low volatility)

- Buy an at-the-money time spread

Directional market view

- Buy an out-of-the-money time spread

Volatile market view (high volatility)

- Sell an at-the-money time spread

Time decay is less than might be expected

There are two bid-ask spreads

The market is very efficient

## 90 Time Spread

| <b>Index</b> | <b>56/28</b> | <b>42/14</b> | <b>35/7</b> | <b>28/Exp</b> |
|--------------|--------------|--------------|-------------|---------------|
| <b>98</b>    | <b>1.09</b>  | <b>1.13</b>  | <b>1.08</b> | <b>0.87</b>   |
| <b>94</b>    | <b>1.40</b>  | <b>1.56</b>  | <b>1.74</b> | <b>1.78</b>   |
| <b>90</b>    | <b>1.40</b>  | <b>1.73</b>  | <b>2.06</b> | <b>3.32</b>   |
| <b>86</b>    | <b>1.24</b>  | <b>1.47</b>  | <b>1.63</b> | <b>1.63</b>   |
| <b>82</b>    | <b>0.92</b>  | <b>0.93</b>  | <b>0.86</b> | <b>0.65</b>   |

# Time Spreads – The Real World

XSP Index @ 89.00

|             | <u>T.V.</u> | <u>Bid</u> |   | <u>Ask</u> |
|-------------|-------------|------------|---|------------|
| Nov 90 Call | (4.20)      | 4.15       | – | 4.25       |
| Oct 90 Call | 2.85        | 2.80       | – | 2.90       |
| Time Spread | (1.35)      |            |   |            |

Do not automatically enter a spread order at the mid point of the bid ask spread.

Market makers do not trade a “price spread.”

They want an “implied volatility spread.”

XSP Index @ 89.00

|              | <u>T.V.</u> | <u>Bid</u> |   | <u>Ask</u> |
|--------------|-------------|------------|---|------------|
| Nov 90 Call  | (4.20)      | 4.15       | – | 4.25       |
| Implied Vol. | 28%         | 14.70%     |   | 15.9%      |
| Oct 90 Call  | (2.85)      | 2.80       | – | 2.90       |
| Implied Vol. | 28%         | 13.4%      |   | 15.3%      |

# Giving Up a 1% Implied Volatility

|              | <u>Bid</u> | – | <u>Ask</u> |
|--------------|------------|---|------------|
| Nov 90 Call  | 4.15       | – | 4.25       |
| Implied Vol. | 14.70%     |   | 15.9%      |
| Oct 90 Call  | 2.80       | – | 2.90       |
| Implied Vol. | 14.4%      |   | 16.3%      |

Implied Volatility can vary by month.

- I.V. in front month higher than back month.
- I.V. in front month higher before earnings.
- Front-month / back-month relationship can change after an earnings announcement.

The market is efficient.

- Bid-ask spreads are a big advantage for the pros.
- Finding “good” time spreads requires work.

The simultaneous purchase of one option and sale of another option.

The options:

- are the same type (calls or puts)

- have the same underlying

- have **different strike prices**

- have **different expiration dates**

Commissions not included

Long Diagonal Spread:

Sell Oct 95 Calls, Buy Nov 90 Calls

Short Diagonal Spread:

Buy Oct 95 Calls, Sell Nov 90 Calls

## Buy the Nov-Oct 90-95 Diagonal Spread

Buy 1 Nov 90 XSP Call @ (4.20)

Sell 1 Oct 95 XSP Call @ 1.20

Net Cost of Spread: (3.00)

XSP @ 89.00

28 days to Oct exp; 56 days to Nov.

# Diagonal Spread – Market Unchanged

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 89.00       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (2.85)      |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>0.00</u> |
| Time Spread     | (3.00)      | → | (2.85)      |

**Max risk = 3.00**

# Diagonal Spread – Market Up 5%

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 93.50       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (5.45)      |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>0.00</u> |
| Time Spread     | (3.00)      | → | (6.75)      |

**Max risk = 3.00**

# Diagonal Spread – Market Up “Big” **CBOE**<sup>®</sup>

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 100.00      |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (10.60)     |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>5.00</u> |
| Time Spread     | (3.00)      | → | (5.60)      |

**Max risk = 3.00**

# The Greeks of a Diagonal Spread

|            |             | $\Delta$    | $\theta$    | $\nu$       | $\tau^*$     |
|------------|-------------|-------------|-------------|-------------|--------------|
| +1 90 Call | 4.20        | +.49        | +.03        | +.14        | -0.30        |
| -1 95 Call | <u>1.20</u> | <u>-.26</u> | <u>-.04</u> | <u>-.08</u> | <u>+0.34</u> |
| Net Debit  | 3.00        | +.23        | -.01        | +.06        | +0.04        |

XSP, 89.00; Volatility 30%

56 days to exp of 90 Call; 28 days to exp of 95 Call

\* 7-day theta

When the short-term expires, you can....

- sell another call (same or different strike)
- close the entire position
- keep the long call

As the market moves, you can (1) buy to close, (2) roll up, (3) roll out or (3) roll down the short call

Diagonal spreads with LEAPS<sup>®</sup> calls is similar in some ways to a buy write.

Directional strategy

Benefits from time decay if implied volatility is unchanged

Decrease in implied volatility has negative impact

Appropriate for a “gradual” directional move

Three ways to trade time spreads

Buy at-the-money for low volatility

Buy out-of-the-money for a directional view

Sell at-the-money for high volatility

Diagonal spreads are similar to vertical spreads – with more managing alternatives

THANK YOU FOR ATTENDING.

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# ANSWERS



## Time and Diagonal Spreads

# Low Volatility – P/(L) Est.

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 89.00       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (2.85)      |
| (S) Oct 90 Call | <u>2.85</u> | → | <u>0.00</u> |
| Time Spread     | (1.35)      | → | (2.85)      |

**Risk 1.35 (??) to make 1.50 (??)**

**Another risk: Decrease in implied volatility**

# Directional View – P/(L) Est.

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 95.00       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 95 Call | (2.40)      | → | (3.50)      |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>0.00</u> |
| Time Spread     | (1.20)      | → | (3.50)      |

**Risk 1.20 (??) to make 2.20 (??)**

# High Volatility – Market Up

|                 |               |   |               |
|-----------------|---------------|---|---------------|
| XSP Index       | 89.00         | → | 98.00         |
| Days to Oct Exp | 28            | → | 0             |
| (S) Nov 89 Call | 4.65          | → | 9.65          |
| (L) Oct 89 Call | <u>(3.30)</u> | → | <u>(9.00)</u> |
| Time Spread     | 1.35          | → | 0.65          |

**Risk 1.50 (??) to make 0.70 (??)**

# High Volatility – Market Down

|                 |               |   |               |
|-----------------|---------------|---|---------------|
| XSP Index       | 89.00         | → | 80.00         |
| Days to Oct Exp | 28            | → | 0             |
| (S) Nov 89 Call | 4.65          | → | 0.50          |
| (L) Oct 89 Call | <u>(3.30)</u> | → | <u>(0.00)</u> |
| Time Spread     | 1.35          | → | 0.50          |

**Risk 1.50 (??) to make 0.85 (??)**

# Time Spreads – The Real World

XSP Index @ 89.00

|             | <u>T.V.</u> | <u>Bid</u> |   | <u>Ask</u> |
|-------------|-------------|------------|---|------------|
| Nov 90 Call | (4.20)      | 4.15       | – | 4.25       |
| Oct 90 Call | 2.85        | 2.80       | – | 2.90       |
| Time Spread | (1.35)      |            |   |            |

**“Natural Bid” 1.25**

**“Natural Ask” 1.45**

# Giving Up a 1% Implied Volatility

|              | <u>Bid</u> | – | <u>Ask</u>   |             |
|--------------|------------|---|--------------|-------------|
| Nov 90 Call  | 4.15       | – | 4.25         | <b>4.23</b> |
| Implied Vol. | 14.70%     |   | <b>15.9%</b> | 15.8%       |

|              |              |   |       |             |
|--------------|--------------|---|-------|-------------|
| Oct 90 Call  | 2.80         | – | 2.90  | <b>2.83</b> |
| Implied Vol. | <b>14.4%</b> |   | 16.3% | 14.8%       |

$$4.23 - 2.83 = 1.40 \quad 0.05 > 1.35$$

The “natural” market: 1.25 – 1.45

A realistic market: 1.30 – 1.40

# Diagonal Spread – Market Unchanged

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 89.00       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (2.85)      |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>0.00</u> |
| Time Spread     | (3.00)      | → | (2.85)      |

**The market did not move; you lost 0.15!**

**Another risk: Decrease in implied volatility**

**Max risk = 3.00**

# Diagonal Spread – Market Up 5%

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 93.50       |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (5.45)      |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>0.00</u> |
| Time Spread     | (3.00)      | → | (6.75)      |

**If you are “right,”  
you make 80%! (approx.)**

**Max risk = 3.00**

# Diagonal Spread – Market Up “Big” **CBOE**<sup>®</sup>

|                 |             |   |             |
|-----------------|-------------|---|-------------|
| XSP Index       | 89.00       | → | 100.00      |
| Days to Oct Exp | 28          | → | 0           |
| (L) Nov 90 Call | (4.20)      | → | (10.60)     |
| (S) Oct 95 Call | <u>1.20</u> | → | <u>5.00</u> |
| Time Spread     | (3.00)      | → | (5.60)      |

**If the market moves more than you expect, you still have a nice profit!**

**Max risk = 3.00**

# The Greeks of a Diagonal Spread

|            |             | $\Delta$    | $\mathcal{G}$ | $\nu$       | $\tau^*$     |
|------------|-------------|-------------|---------------|-------------|--------------|
| +1 90 Call | 4.20        | +.49        | +.03          | +.14        | -0.30        |
| -1 95 Call | <u>1.20</u> | <u>-.26</u> | <u>-.04</u>   | <u>-.08</u> | <u>+0.34</u> |
| Net Debit  | 3.00        | +.23        | -.01          | +.06        | +0.04        |

**Positive: Near -0- exposure to volatility and time**

**Negative: low delta and near zero gamma**

XSP, 89.00; Volatility 30%

56 days to exp of 90 Call; 28 days to exp of 95 Call

\* 7-day theta