Time Spreads

Presented by

OIC  The Options Industry Council

1-888-OPTIONS
Time Spreads

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In order to simplify the computations, commissions, fees, margin interest and taxes have not been included in the examples used in these materials. These costs will impact the outcome of all stock and options transactions and must be considered prior to entering into any transactions. Investors should consult their tax advisor about any potential tax consequences.

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Presentation Outline

- Time spread basics
  - spread features
  - motivation for using
  - effect of time decay and volatility
  - risk vs. reward profile
  - debit spread

- Establishing a time spread
  - choice of strike and expiration

- Specific time spread example
  - position maintenance
  - time spread vs. short straddle
Time Spread Basics
Time Spread

What is a long time spread?
- sell 1 near-term option (short)
- buy 1 far-term option (long)
- same strike price
- all calls or all puts – 1:1 ratio
- selected strike price generally at-the-money
- debit spread
Time Spread

- **Expectation**
  - generally neutral on underlying stock price
  - can be used as bullish or bearish strategy

- **Also known as**
  - “calendar” spread
  - “horizontal” spread
Time Decay & Volatility

• Beyond underlying stock move, option investors must contend with
  - time decay (measured by theta)
  - changing implied volatility (measured by vega)

• Time decay
  - given – normally occurring phenomenon
  - theta = rate of time value decay per time unit (1 day)

• Implied volatility
  - change is unpredictable
  - vega = change in option price per 1% point change in volatility
Time Spread

• You have 2 expirations
  - near-term – short option expires
  - far-term – long option expires

• Motivation
  - take advantage of short-term time decay
  - expect long-term volatility to stay same or increase
    – i.e., implied volatility not underlying volatility
Time Spread at Near-Term Expiration

• Maximum profit scenario
  - underlying at strike price
  - short option at-the-money (or slightly out-of-the-money)
  - no assignment on short contract
  - long option has maximum value (volatility dependant)

• Maximum profit
  - value of long call less debit paid for spread

• Maximum profit calculation
  - long call value at near-term expiration can only be predicted via pricing model
Time Spread at Near-Term Expiration

- Maximum loss at near-term expiration
  - limited to debit paid for spread

- Maximum loss seen if
  - underlying away from strike price
  - both options out-of-the-money and worthless
  - both options deep in-the-money with no time value
  - spread between option values = 0
Time Decay Review

- Time decay is a given – will occur
  - rate of decay generally greatest last 30 days
  - at expiration option worth intrinsic value (if any)
Establishing Time Spread

• Calls generally used

• Strike price generally at-the-money
  - most time value

• Result = neutral spread
  - want underlying price to stabilize around at-the-money strike up to near-term expiration
Establishing Time Spread

• Generally 4 or 5 expirations available

• Short near-term option
  - consider around 30 to 60 days away
  - time decay begins to increase until expiration
  - balance time value sold against rate of decay desired

• Long far-term option
  - more time = more expensive = larger debit paid (at risk)
  - more time = more time value
  - balance these two for comfort level
Long Call Time Spread

Specific Example
Long Call Time Spread

- Late March – XYZ at $50 – calls at 30% volatility
  - XYZ Apr 50 call (26 days) = $1.70
  - XYZ May 50 call (54 days) = $2.50
  - XYZ Jul 50 call (117 days) = $3.75

- Balancing debit at risk with time value sold
  - sell 1 May 50 call at $2.50
  - buy 1 Jul 50 call at $3.75
  - net debit paid = $1.25

- XYX May/Jul 50 time spread purchased
  - $1.25 debit, or $125 total
Long May/Jul 50 Time Spread
May Expiration

- **XYZ at $50**
- **May 50 call**
  - expires at-the-money
  - has no value – keep premium
- **July 50 call**
  - at-the-money – 2 months to live
  - theoretical value (30% volatility) = $2.70
- **Maximum profit**
  - $2.70 Jul 50 call value – $1.25 debit = $1.45 ($145)
Long May/Jul 50 Time Spread
May Expiration

XYZ at $50

Maximum Profit
$1.45

Maximum Loss
$1.25 debit paid

Upside – bullish bias
some time value remaining in long call

$46.75 BEP

$54.60 BEP
Long May/Jul 50 Time Spread
May Expiration

XYZ at $50

- volatility at 30%
- volatility less than 30%
• Investor choices with XYZ at $50 strike

• Neutral spread investor
  - initial intent was to sell spread at close on Friday for profit (of $1.45), but…
  - remaining neutral can sell Jun 50 call against long Jul 50 call (new time spread), or…
  - if now bullish hold long call
• Bullish time spread investor
  - XYZ initially expected to increase after May
  - May 50 call sold simply to reduce cost of Jul 50 call
  - long July call currently at $2.70 (theoretical value) now held for initial $1.25 debit paid for spread

• Difference between neutral spread investor and bullish spread buyer is matter of initial intentions
Long Call Time Spread

Managing the Position
In advance of expiration, if XYZ rises or drops significantly:
- spread between option values will shrink
- possibly sell spread to cut loss
- possibly roll to new strike – more money invested

Expiration near and calls in-the-money:
- assignment possible on short May 50 call
- to avoid assignment sell spread
• About “legging” out of spread (closing one side before other)
  - can be a risky venture – initial intent was to spread

• Closing one leg first, in general
  - market exposure on other leg

• Closing (selling) long leg first
  - naked short call
  - unlimited upside risk
  - possibly significant short call margin requirement
Neutral Time Spread
Bullish or Bearish?

• For “neutral” investor spread can be initially established with bullish or bearish bias
  - choose strike price accordingly

• Bullish
  - selected strike above current XYZ price
  - XYZ up before near-term expiration to close at strike

• Bearish
  - selected strike below current XYZ price
  - XYZ down before near-term expiration to close at strike
Time Spread vs. Short Straddle

Note the Differences
Another Way to Sell Time Value?

- You want to sell time value – take advantage of time decay?
  - there is always this strategy – vaguely similar graph

[Graph: Short Straddle]
Another Way to Sell Time Value?

- Late March – short XYZ May 50 straddle
  - May 50 call sold for $2.50
  - May 50 put sold for $2.15
  - net credit received = $4.65 ($465 total)

Maximum Profit:
- $4.65 credit received
  (XYZ at $50 at expiration)

Maximum Loss:
- unlimited

Short Straddle

$45.35 BEP

$54.65 BEP
Short Straddle vs. Time Spread

- Short straddle and time spread – similar risk vs. reward profiles?  
  - no way!

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<thead>
<tr>
<th>Risk</th>
<th>Short Straddle</th>
<th>Long Time Spread</th>
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<tbody>
<tr>
<td>Risk</td>
<td>unlimited</td>
<td>limited</td>
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<tr>
<td>Time Decay</td>
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<td>good</td>
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<tr>
<td>Volatility</td>
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<td>↑ good</td>
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<td></td>
<td>↓ good</td>
<td>↓ bad</td>
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at expiration
Call time spread
- sell near-term call and buy far-term call (same strike)
- neutral position until near-term expiration
- debit spread
- selling time value of near-term call vs. long-term call
- maximum loss = debit paid
- maximum profit = depends on long call value (or volatility) at near-term expiration