TRADING VERTICAL SPREADS

Today’s Topics

- Quick review of vertical spreads
- Entering spread orders
Presentation Outline

- Vertical Spread Basics
  - Bull & Bear Spreads Defined
  - Mechanics at Expiration
- Important Concepts of Option Prices
- Price Behavior of Vertical Spreads
- Entering Spread Orders
**Vertical Spreads**

**Buy one** option and **sell another** option

**Same** underlying

**Same** expiration dates

**Different** strike prices
Bull Call Spread

Buy a lower strike and sell a higher strike

Buy 1  100 Call  6.00
Sell 1  110 Call  2.50
Net Cost  (3.50)

Also known as a “Debit Call Spread”
Bull Call Spread – At Expiration

Buy 1 100 Call 6.00
Sell 1 110 Call 2.50
Net Cost (3.50)
Bull Call Spread – At Expiration

Maximum loss = net cost
(3.50 in this example)
Bull Call Spread – At Expiration

Maximum profit = Spread – Net Cost

(= 10.00 - 3.50 = 6.50 in this example)
Bull Call Spread – At Expiration

Stock price below lower strike at expiration:
Both calls expire; result = no position, max loss
Bull Call Spread – At Expiration

Stock price between strikes at expiration: Long call is exercised; short call expires; result = long stock (at strike + net cost)
Bull Call Spread – At Expiration

Stock price above higher strike at expiration: Long call exercised; short call assigned; result = buy stock, sell stock, no position
Bear Call Spread

Sell a lower strike and buy a higher strike

Sell 1 100 Call 6.00
Buy 1 110 Call 2.50
Net Credit 3.50
Bear Put Spread

Buy a higher strike and sell a lower strike

Buy 1 100 Put 5.00
Sell 1 90 Put 2.00
Net Cost (3.00)
**Bull Put Spread**

Sell a higher strike and buy a lower strike

- Sell 1 100 Put 5.00
- Buy 1 90 Put 2.00
- Net Credit 3.00
Option Prices - Important Concepts
Option Pricing Concepts

Quiz

Days to Expiration  44  →  28
XYZ Stock          99  →  102
XYZ 100 Call       1.50  →  ??

**Estimate the new price of the 100 Call**
### Option Pricing Concepts

#### Quiz

<table>
<thead>
<tr>
<th>Starting Assumptions</th>
<th></th>
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<tbody>
<tr>
<td>Days to Expiration</td>
<td>44 → 28</td>
</tr>
<tr>
<td>XYZ Stock</td>
<td>99 → 102</td>
</tr>
<tr>
<td>XYZ 100 Call</td>
<td>1.50 → ??</td>
</tr>
</tbody>
</table>

**Estimate the new price of the 100 Call**
Option Pricing Concepts

Quiz

Stock price rises 3

Days to Expiration 44 → 28

XYZ Stock 99 → 102

XYZ 100 Call 1.50 → ??

Estimate the new price of the 100 Call
Option Pricing Concepts

Quiz

16 days pass

Days to Expiration  44 → 28

XYZ Stock  99 → 102

XYZ 100 Call  1.50 → ??

Estimate the new price of the 100 Call
Option Pricing Concepts

Quiz

Days to Expiration  44  →  28

XYZ Stock  99  →  102

XYZ 100 Call  1.50  →  ??

Estimate the new price of the 100 Call
Option Pricing Concepts

Quiz - Answer

Days to Expiration 44 → 28
XYZ Stock 99 → 102
XYZ 100 Call 1.50 → 2.80
Option Pricing Concepts

Days to Expiration          44  →  28
XYZ Stock                   99  →  102
XYZ 100 Call               1.50  →  2.80

Concepts: Delta & Time Decay
Option Pricing Concepts

Days to Expiration  44  →  28
XYZ Stock  99  →  102
XYZ 100 Call  1.50  →  2.80

Delta: option prices change less than stock prices
# Option Pricing Concepts

<table>
<thead>
<tr>
<th>Days to Expiration</th>
<th>44 → 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>XYZ Stock</td>
<td>99 → 102</td>
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<td>XYZ 100 Call</td>
<td>1.50 → 2.80</td>
</tr>
</tbody>
</table>

**Time Decay:** option prices decrease as time passes.
Option Pricing Concepts

Conclusions:

Option traders must know the delta of their options and have a specific time forecast.
Price Behavior of Spreads
Price Behavior of Spreads

XYZ @ 88.90  28 Days to Expiration

Buy 1  28-day  90 Call  3.50
Sell 1  28-day  95 Call  1.80
Net Debit   (1.70)

What is the estimated profit in 21 days (7 days to expiration) with XYZ at 94?
## Price Behavior of Spreads

<table>
<thead>
<tr>
<th></th>
<th>Price</th>
<th>Delta</th>
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<tbody>
<tr>
<td>XYZ Stock</td>
<td>88.90</td>
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</tr>
<tr>
<td>28-day 90 Call</td>
<td>3.50</td>
<td>+0.48</td>
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<tr>
<td>28-day 95 Call</td>
<td>1.80</td>
<td>-0.30</td>
</tr>
<tr>
<td>Net</td>
<td>1.70</td>
<td>+0.18</td>
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</table>
# Price Behavior of Spreads

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<th>28 days</th>
<th>7 days</th>
<th></th>
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</thead>
<tbody>
<tr>
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<td>88.90</td>
<td>94.00</td>
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</tr>
<tr>
<td>90 Call</td>
<td>3.50</td>
<td>4.60</td>
<td>+30%</td>
</tr>
<tr>
<td>95 Call</td>
<td>1.80</td>
<td>1.60</td>
<td>-12%</td>
</tr>
<tr>
<td>Spread Value</td>
<td>1.70</td>
<td>3.00</td>
<td>+75%</td>
</tr>
</tbody>
</table>

**90 Call: Profit = $110 (30%)**
# Price Behavior of Spreads

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**95 Call:** Loss = $20 (-12%)
## Price Behavior of Spreads

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**90-95 Call Spread: Profit = $130 (+75%)**
Price Behavior of Spreads

Conclusions:

- Lower cost (risk) than A-T-M options
- Lower (limited) maximum profit
- Less sensitive to time erosion
- In some cases a higher % profit
Entering a Spread Order
## Entering a Spread Order

<table>
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<td>6.20</td>
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<td>2.70</td>
</tr>
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</table>

“Natural Bid”

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>100 Call@</td>
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<tr>
<td>110 Call@</td>
<td>2.70</td>
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<tr>
<td>Spread @</td>
<td>3.30</td>
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<td>2.70</td>
</tr>
</tbody>
</table>

“Natural Offer”

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Call</td>
<td>@ 6.20</td>
</tr>
<tr>
<td>110 Call</td>
<td>@ 2.50</td>
</tr>
<tr>
<td>Spread</td>
<td>@ 3.70</td>
</tr>
</tbody>
</table>
Entering a Spread Order

- First, determine the “natural” bid and offer.
- Second, decide if you can “do better” than the natural bid or offer.
- Third, enter a limit-price order for the spread.
## Entering a Spread Order

<table>
<thead>
<tr>
<th>Case</th>
<th>Bid</th>
<th>Ask</th>
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<tbody>
<tr>
<td>80 Call</td>
<td>3.10</td>
<td>3.30</td>
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<tr>
<td>85 Call</td>
<td>1.60</td>
<td>1.70</td>
</tr>
</tbody>
</table>

You want to buy the 80-85 Call Spread.

Can you pay lower than the natural?
## Entering a Spread Order

<table>
<thead>
<tr>
<th>Case 1</th>
<th>Bid</th>
<th>Ask</th>
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<tbody>
<tr>
<td>80 Call</td>
<td>3.10</td>
<td>3.30</td>
</tr>
<tr>
<td>85 Call</td>
<td>1.60</td>
<td>1.70</td>
</tr>
</tbody>
</table>

“Natural bid” 1.40 – “Natural ask” 1.70

Maybe you can pay 1.60.
Entering a Spread Order

Case 2

<table>
<thead>
<tr>
<th></th>
<th>Bid</th>
<th>Ask</th>
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<tbody>
<tr>
<td>40 Call</td>
<td>2.00</td>
<td>2.05</td>
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<tr>
<td>45 Call</td>
<td>0.85</td>
<td>0.90</td>
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</table>

You want to buy the 40-45 Call Spread.

Can you pay lower than the natural?
## Entering a Spread Order

<table>
<thead>
<tr>
<th>Case 2</th>
<th>Bid</th>
<th>Ask</th>
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<tbody>
<tr>
<td>40 Call</td>
<td>2.00 - 2.05</td>
<td>2.05</td>
</tr>
<tr>
<td>45 Call</td>
<td>0.85 - 0.90</td>
<td>0.85</td>
</tr>
</tbody>
</table>

“Natural bid” 1.10 – “Natural ask” 1.20

1.20 is likely the best price.
Entering a Spread Order

Conclusion:

Spread orders should be entered at a net price. Traders must consider the bid-ask spread of each option when calculating the net price of a spread.
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- Visit us: www.888options.com
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- The same workstation that keeps IB affiliate Timber Hill—the largest market maker of equity options worldwide—ahead of the curve through constant upgrades is offered to institutions, independent investment advisors, brokers, and active traders.
- IB’s smart-routing software performs extremely fast, reliable, direct access best execution trades worldwide—or choose the market center you want when trading US shares or options.
- 29 different order types—including stops, stop-limits, trailing stops and OCA.
- Program directly to industry-standard FIX or our proprietary application programming interface (API).
- A history of innovation, starting with creation of the first handheld computers used for trading in 1983.
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- IBG executes 11% of global volume of exchange traded equity derivatives.
- The Group provides continues, firm quotes for over 400,000 proprietary and customer trades a day.
- The 20th largest US brokerage and trading firm, according to Institutional Investor.

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- Corporate headquarters: Greenwich, Connecticut, USA.
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- Specialized account configurations are available for institutions, independent investment advisors, brokers, and active traders.
- Low commissions and finance rates.
- Customers in over 100 nations.
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Chain Stock Order

<table>
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<tr>
<th>Underlying</th>
<th>Description</th>
<th>Avg Cost</th>
<th>Time In Fe</th>
<th>Unrealized</th>
<th>Bid Size</th>
<th>Bid Price</th>
<th>Ask Price</th>
<th>Ask Size</th>
<th>Last Price</th>
<th>Change</th>
<th>High</th>
<th>Low</th>
<th>Volume</th>
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<tbody>
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<td>CBOE Index OEX</td>
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<td></td>
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Option Chains (OEX)

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<tr>
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<th>Expiry</th>
<th>ALL</th>
<th>Exchange</th>
<th>SMART</th>
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<th>Reset</th>
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<th>Clear All</th>
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<tr>
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<tr>
<td>Bid Size</td>
<td>Bid Price</td>
<td>Ask Price</td>
<td>Ask Size</td>
<td>Last Price</td>
<td>Change</td>
<td>Description</td>
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<td>Bid Price</td>
<td>Ask Price</td>
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<td>100</td>
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<tr>
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<td>100</td>
<td>CBOE 120</td>
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<td>0.00</td>
<td>0.00</td>
<td>100</td>
<td>0.00</td>
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</tbody>
</table>

| Put     |             |       |     |          |       |        |       |             |           |
| Bid Size | Bid Price | Ask Price | Ask Size | Last Price | Change | Description | Bid Size | Bid Price | Ask Price | Ask Size | Last Price | Change | High | Low | Volume |
| 100    | 30.60      | 30.60 | 100 | CBOE 60 | 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 25.70      | 25.70 | 100 | CBOE 70 | 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 20.80      | 20.80 | 100 | CBOE 80 | 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 16.90      | 17.00 | 100 | CBOE 90 | 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 13.00      | 13.00 | 100 | CBOE 100| 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 9.10       | 9.10  | 100 | CBOE 110| 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
| 100    | 5.20       | 5.20  | 100 | CBOE 120| 100   | 0.00   | 0.00    | 100       | 0.00       | 1.11 |      |     |        |
### Interactive Brokers Analytics

The Professional’s Gateway to the World’s Markets

![Interactive Brokers Analytics](image)

### Order Management

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Exch</th>
<th>Description</th>
<th>Bid Size</th>
<th>Bid Price</th>
<th>Ask Price</th>
<th>Ask Size</th>
<th>Bid Qty</th>
<th>Ask Qty</th>
<th>Last Price</th>
<th>Change</th>
<th>High</th>
<th>Low</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
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<td>SMART</td>
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<td>756</td>
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**Interactive Analytic**: Option Analytics

### Interactive Analytic

- Interactive Analytic [Link]
- Option Analytics [Link]

**Last Update**: Dec 25, 09:10
For additional information about Interactive Brokers

http://www.interactivebrokers.com/

cshaw@interactivebrokers.com
INDEX OPTIONS
Introduction to “Trading the Market”

Presented by: The CBOE’s Options Institute
Options_Institute@cboe.com
www.cboe.com
Disclosures

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.

Regarding taxes, you should consult a professional tax advisor for the latest IRS regulations and how they apply to your individual situation. Comments in this presentation about taxes are taken from “Taxes and Investing,” published by The Options Industry Council and may not reflect the latest regulations.
Presentation Outline

- Motivation for Trading Index Options
- Unique Features of Index Options
- A Trading Exercise
Why Trade Index Options?

Individual stocks have:
- Company Risk
- Sector Risk
- Market Risk

Index options enable you to trade “the market.”
Many major market averages have options

- S&P 500® Stock Index
- Dow Jones® Industrial Average
- NASDAQ 100® Stock Index
Which Indexes Have Options?

- Many major market averages have options
  - S&P 500 Stock Index
  - Dow Jones Industrial Average
  - NASDAQ 100 Stock Index
- Sector Indexes also have options
  - GSTI™ Internet Index
  - Dow Jones® Equity REIT Index
  - CBOE Oil Index® Options
What is an Index Option?

- Stock options give the buyer the right to buy or sell the underlying stock (100 shares)
What is an Index Option?

- **Stock options** give the buyer the right to buy or sell the underlying stock (100 shares)
- **Index options** give the buyer the right to receive a **cash payment** equal to the in-the-money amount.
What is an Index Option?

- Stock options give the buyer the right to buy or sell the underlying stock (100 shares).

- **Index options** give the buyer the right to receive a cash payment equal to the in-the-money amount. THIS IS KNOWN AS “CASH SETTLEMENT”
Basic Strategy – Buy Call
Basic Strategy – Buy Put
Features of Index Options

1. $100 Multiplier
2. Cash Settlement
3. Exercise Style
4. Settlement Method
5. Broad-Based vs. Narrow-Based
$100 Multiplier

The actual dollar cost of an index option is $100 times the stated option price.

“OEX 600 Call @ 8.00”

Price of Option = 8 x $100 = $800
The Cash Settlement Process
The Cash Settlement Process

Example: The OEX Index is 613.53 at exp. What is the value of a 600 Call?
The Cash Settlement Process

Example: The OEX Index is 613.53 at exp.

What is the value of a 600 Call?

<table>
<thead>
<tr>
<th>Index Value</th>
<th>613.53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Strike Price</td>
<td>600.00</td>
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<td>Difference</td>
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The Cash Settlement Process

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What is the value of a 600 Call?

Index Value 613.53
Less Strike Price 600.00
Difference 13.53
x Multiplier x $100
The Cash Settlement Process

**Example:** The OEX Index is 613.53 at exp.

What is the value of a 600 Call?

- **Index Value:** 613.53
- **Less Strike Price:** 600.00
- **Difference:** 13.53
- **x Multiplier:** $100
- **Cash from Seller to Buyer:** $1,353.00
Alternatives to Exit Positions
Alternatives to Exit Positions

- Index Option Buyers
  - Sell the option to close the position
  - Hold to expiration
Alternatives to Exit Positions

- **Index Option Buyers**
  - Sell the option to close the position
  - Hold to expiration
    - Receive the cash settlement value
    - Let the option expire worthless (maximum loss)
Alternatives to Exit Positions

- Index Option Sellers
  - Buy the option to close the position
  - Hold to expiration
Alternatives to Exit Positions

- **Index Option Sellers**
  - Buy the option to close the position
  - Hold to expiration
    - Pay the cash settlement value
    - Let the option expire worthless (maximum profit)
Exercise Style – Two Types

American-Style Exercise

European-Style Exercise
American-style Exercise

An option subject to American-Style Exercise can be exercised on any business day before the option’s expiration date.

Exercise must also occur before your brokerage firm’s daily exercise deadline.

Remember, options can be sold on any business day.
European-style Exercise

An option subject to European-style Exercise can only be exercised at a specific time, which is generally the last day prior to the option’s expiration date.

Remember, options can be sold on any business day.
Price Behavior Prior to Expiration

- Today is September 15. The OEX Index is 500.
- The December OEX 500 Call is currently 20.
- Your forecast:
  The OEX Index will rise 10 index points in 1 week.
- Question:
  If your forecast is correct and you buy 1 OEX 500 Call, how much will you make?
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Price Behavior Prior to Expiration

- OEX on 9/15: 500 → 510 (in one week, on 9/22)
- OEX 500 Call: 20 → ??

What is your forecast for the price of the OEX December 500 Call?
Price Behavior Prior to Expiration

- OEX on 9/15 500 → 510 (in one week, on 9/22)
- OEX 500 Call 20 → ??

What is your forecast for the price of the OEX December 500 Call?

There are two important concepts you must know.
Concept #1  - Delta

Most options do not change in price as much as the underlying changes in price.

Delta is an estimate of the rate of change in an option’s price for a one unit change in the price of the underlying assuming all other factors are unchanged.
Option prices generally do not decrease at the same rate that time passes to expiration.
Price Behavior Prior to Expiration

- OEX on 9/15: 500 ➔ 510 (in one week, on 9/22)
- OEX 500 Call: 20 ➔ 24.80
Summary - Trade the Market

Avoid the risks of trading individual stocks.
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Broad-Based Index Options:

Trade the “Whole Market”
Summary - Trade the Market

Avoid the risks of trading individual stocks.

Broad-Based Index Options:
  Trade the “Whole Market”

Narrow-Based Index Options:
  Trade the “Sectors You Know”
Thank You for Attending

- Contact us at:  www.cboe.com
- The Options Institute
  - 1-877-THE-CBOE then press 4,3
- Questions:  options_institute@cboe.com
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