Welcome to

Trading VIX® Futures

January 23, 2007

- This Presentation will begin at 3:30 Central Time.
- The speaker today is Dan Passarelli, Instructor at The Options Institute of Chicago Board Options Exchange (CBOE).
Disclosures & Disclaimers

For the sake of simplicity, the examples that follow do not take into consideration commissions and other transaction fees, tax considerations, or margin requirements, which are factors that may significantly affect the economic consequences of a given strategy. An investor should review transaction costs, margin requirements and tax considerations with a broker and tax advisor before entering into any strategy.

Futures trading involves substantial risk and is not suitable for everyone.

Any strategies discussed, including those examples using actual securities and price data, are strictly for illustrative and educational purposes and are not to be construed as an endorsement, recommendation or solicitation to buy or sell futures contracts. Supporting documentation will be supplied upon written request. Past performance is not indicative of future results.

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Presentation Outline

- What Is VIX?
- Why Futures on VIX?
- Contract Specifications
- The Futures-Cash Relationship
- Unique Pricing Concepts
- Two Trading Case Studies
The VIX

- VIX - the CBOE’s Volatility Index
- Created in 1993 by Professor Robert Whaley of Duke University
- Goal: to measure the level of 30-day implied volatility
- Originally based on OEX options
- 2003 – Formula changed and underlying options changed to SPX
What Is VIX?

- CBOE’s Volatility Index is a proprietary measure of the implied volatility of options on the S&P 500 Stock Index.
VIX and the S&P 500

- Also known as the “Fear Index,” VIX gives an indication of how anxious options buyers are.
- A “low” VIX indicates complacency.
- A “high” VIX indicates anxiety.
- VIX tends to rise as the SPX falls.
VIX Futures – What Strategy?

Historical observation:

Market down → VIX up (& vice versa)

Implication:

Bullish on the market, sell VIX futures

Bearish on the market, buy VIX futures
VIX Contract Specs

- Ticker symbol
- Contract value and Tick Size
- Contract months available
- Trading Hours / Trades Online
- Expiration Procedures
- Marked-to-Market
- Margin Requirements
<table>
<thead>
<tr>
<th>Month</th>
<th>Ticker Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 07</td>
<td>VXG7</td>
</tr>
<tr>
<td>March 07</td>
<td>VXH7</td>
</tr>
<tr>
<td>April 07</td>
<td>VXJ7</td>
</tr>
<tr>
<td>May 07</td>
<td>VXX7</td>
</tr>
<tr>
<td>June 07</td>
<td>VXM7</td>
</tr>
<tr>
<td>August 07</td>
<td>VXQ7</td>
</tr>
<tr>
<td>November 07</td>
<td>VXX7</td>
</tr>
<tr>
<td>May 08</td>
<td>VXX8</td>
</tr>
</tbody>
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Futures Contract Value

VIX Index
VBI Index = 10 x VIX Index
Futures Contract Value = $100 x VBI
VIX = 15
VBI = 150
VX Futures: Price = 150

Value = $15,000 (150 * $100)
Tick Size

1 tick = \(0.10 \times (150.0 - 150.1)\)
= $10

1 point = 10 ticks \((150.0 - 151.0)\)
= $100
Available Contracts

Up to six near-term serial months and five months on the February quarterly cycle.

If today is January 23, 2007:

Trading Hours

- Trading Hours: 8:30 am – 3:15 pm CST
- Trades Online
Expiration Procedures

- **Last Trading Day:** Tuesday (30 days before SPX options expire)
- **Final Settlement:** Wednesday open
- **Special Opening Quotation of VIX (SOQ)**
  - VIX Cash Index based on mid-point of SPX Index Options bids and asks
  - ***VIX SOQ based on 1st traded prices at open of SPX Index options***
## Margin Requirements

<table>
<thead>
<tr>
<th></th>
<th>Long or Short</th>
<th>Spread</th>
<th>per contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Margin</td>
<td>$2,250</td>
<td>Initial Margin</td>
<td>$50</td>
</tr>
<tr>
<td>Minimum Margin</td>
<td>$1,800</td>
<td>Minimum Margin</td>
<td>$40</td>
</tr>
</tbody>
</table>
Margin & Leverage

Initial Margin = $2,250
Minimum Margin = $1,800

Buy 1 contract = $2,250 initial
= $1,800 maintenance

If your account falls below $1,800, you must immediately close your position or deposit more money.
VIX compared to Aug VIX Futures

Aug 06 VIX Futures/10

VIX Index
## VIX compared to VIX Futures

<table>
<thead>
<tr>
<th>Date</th>
<th>VIX Index</th>
<th>VIX Futures/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/12</td>
<td>11.3</td>
<td>15.6</td>
</tr>
<tr>
<td>4/14</td>
<td>14.5</td>
<td>16.3</td>
</tr>
<tr>
<td>4/15</td>
<td>17.7</td>
<td>17.0</td>
</tr>
<tr>
<td>4/21</td>
<td>14.4</td>
<td>16.0</td>
</tr>
</tbody>
</table>
VIX Futures – VIX Index

- What is the relationship?
VIX Futures – VIX Index

- VIX futures prices are based purely on expectations.
- The current futures price is the market’s estimate of what the VIX Index will be at settlement.
- There is no cost-of-carry relationship.
<table>
<thead>
<tr>
<th>Date</th>
<th>5/10/05 (98 days to Aug expiration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIX Index</td>
<td>12.8</td>
</tr>
<tr>
<td>VIX AUG Futures/10</td>
<td>15.6</td>
</tr>
</tbody>
</table>
#1 – Your Forecast - 1

- Date: 5/10 → 5/24
- VIX Index: 12.8 → 20.0
- AUG Futures/10: 15.6 → ???
#1 – Your Forecast - 1

- Date: 5/10 → 5/24
- VIX Index: 12.8 → 20.0
- AUG Futures/10: 15.6 → 19.0
Case Study #1 - Conclusions

- VIX Index: 12.8 → 20.0
- Futures/10: 15.6 → 19.0
  premium → discount
Case Study #2

Date  7/4/05 (43 days to Aug expiration)

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</tr>
</thead>
<tbody>
<tr>
<td>VIX Index</td>
<td>11.6</td>
</tr>
<tr>
<td>VIX AUG Futures/10</td>
<td>14.1</td>
</tr>
</tbody>
</table>
#2 – Your Forecast

- Date: 7/4 (43) → 8/4 (12)
- VIX Index: 11.6 → 12.2
- AUG Futures/10: 14.1 → ???
#2 – Your Forecast

- **Date**: 7/4 (43) → 8/4 (12)
- **VIX Index**: 11.6 → 12.2
- **AUG Futures/10**: 14.1 → 13.6
Case Study #2 - Conclusions

- Date: 7/4 (43) → 8/4 (12)
- VIX Index: 11.6 → 12.2
- Futures/10: 14.1 → 13.6
- Futures & Index converge at expiration
VIX Futures (ticker VX) is based on the popular CBOE Volatility Index

- Tick size = $10 (150.0 – 150.1)
- Contract value with VIX at 15 = $15,000
- Margin for 1 contract = $2,250
Summary - 2

- VIX Futures prices are based on expectations, not cost of carry.
- VIX Futures prices can swing from a premium to a discount relative to VIX index.
High Volatility of Volatility

Avg. 30-Day Historic Volatilities in 2005

- VIX: 83.3%
- VIX Futures*: 45.8%
- S&P 500: 10.3%
- IBM: 17.9%
- Google: 32.1%

* Based on the near-term VIX futures prices
Thank You For Attending

- Questions
- Thank you for attending

For more information, please contact:
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