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Introduction to VIX Futures

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- VIX Futures Basics
- The VIX Futures Pricing Curve
- VIX Futures as a SPX Signal
- VIX / SPX Relationship
- Summary / Q&A

The VIX[®] –

CBOE Volatility Index[®].

Measures S&P 500[®] implied volatility.

Based on S&P 500 Option bid/ask quotes.

Uses the nearby options with at least 8 days until expiration.

Has been promoted as a ‘fear index’ by the business media.

A Brief History of the VIX –

1993 – VIX introduced in a paper.

2003 – VIX calculation changed.

2004 – futures contracts introduced.

2006 – options on VIX begin trading.

2008 – binary options on the VIX.

2009 – mini-VIX futures introduced.

2010 – Weekly Options on VIX Futures.

VIX Futures

- Value is \$1000 x the level of the VIX Index.
- Trade the next 8 months of expiration.
- Expire on Wednesday 30 days before corresponding S&P 500 option expiration.
- Have very unique characteristics relative to other financial futures.

Pricing –

VIX Future

Feb 2011 VIX – VXG1 @ 21.65 = \$21,650

Minimum price move = .05 or \$50.

+/- 1.00 price change = +/- \$1000.

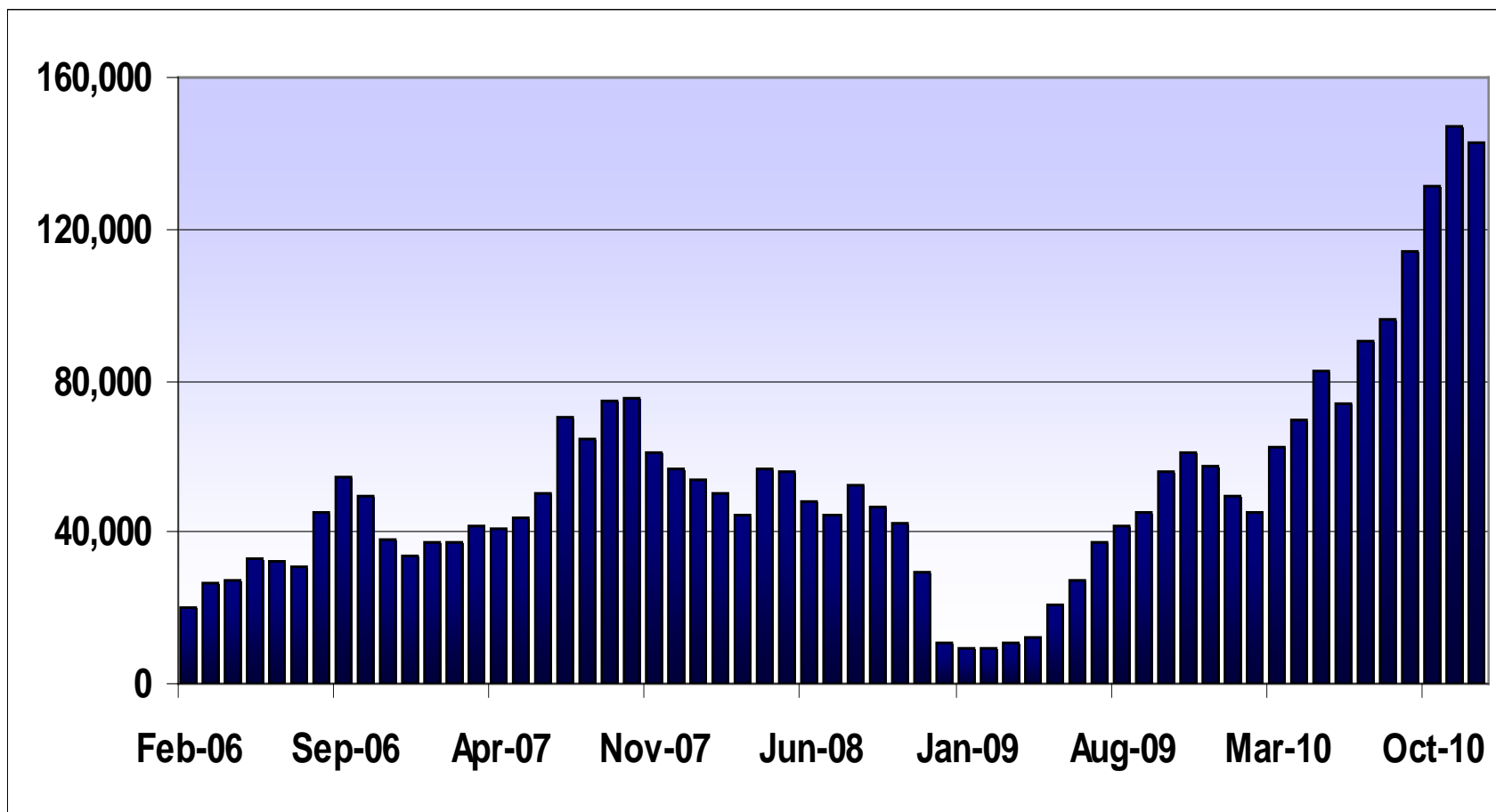
Expiration Months –

VIX Futures

Next 8 Months

Currently – Jan, Feb, Mar, Apr,
May, Jun, Jul, Aug

Open Interest Growth -



Wednesday Settlement 30 Days Before the Next Option Settlement Date

	VIX Option Expiration	Next Standard Option Expiration
January 2011	Jan 19	Feb 18
February 2011	Feb 16	Mar 18
March 2011	Mar 16	Apr 15
April 2011	Apr 20	May 20
May 2011	May 18	Jun 17
June 2011	Jun 15	Jul 15
July 2011	Jul 20	Aug 19
August 2011	Aug 17	Sep 16

Settlement Pricing –

VIX futures are AM settled contracts.

AM settlement involves a special calculation of the VIX Index taking place the morning after the end of trading for a futures contract.

This is known as the Special Opening Quotation.

Special Opening Quotation (SOQ) –

This is a unique VIX index quote that involves only actual S&P 500 option trades.

The regular VIX Index calculation uses the mid-point between bids and offers.

The symbol for the SOQ is VRO.

AM Settlement – Recent Results

Settlement Date	VIX Index Tuesday Close	VIX Future Tuesday Close	VIX AM Settlement
Dec 2010	16.49	16.75	16.01
Nov 2010	22.58	22.25	22.21
Oct 2010	20.63	20.95	21.41
Sep 2010	21.56	21.70	22.97
Aug 2010	24.33	24.35	24.82
July 2010	23.93	24.40	23.79
June 2010	25.87	25.85	26.11
May 2010	33.55	32.70	34.53
April 2010	15.73	16.00	15.80
March 2010	17.69	17.45	16.68
February 2010	22.25	22.60	22.50
January 2010	17.58	17.85	18.87

AM Settlement –

Settlement Date	Index Value	Future Value	Settlement Value
Dec 2010	\$16,490	\$16,750	\$16,010
Sep 2010	\$21,560	\$21,700	\$22,970
May 2010	\$33,550	\$32,700	\$34,530
March 2010	\$17,690	\$17,450	\$16,680

AM Settlement May Result in a ‘Surprise’

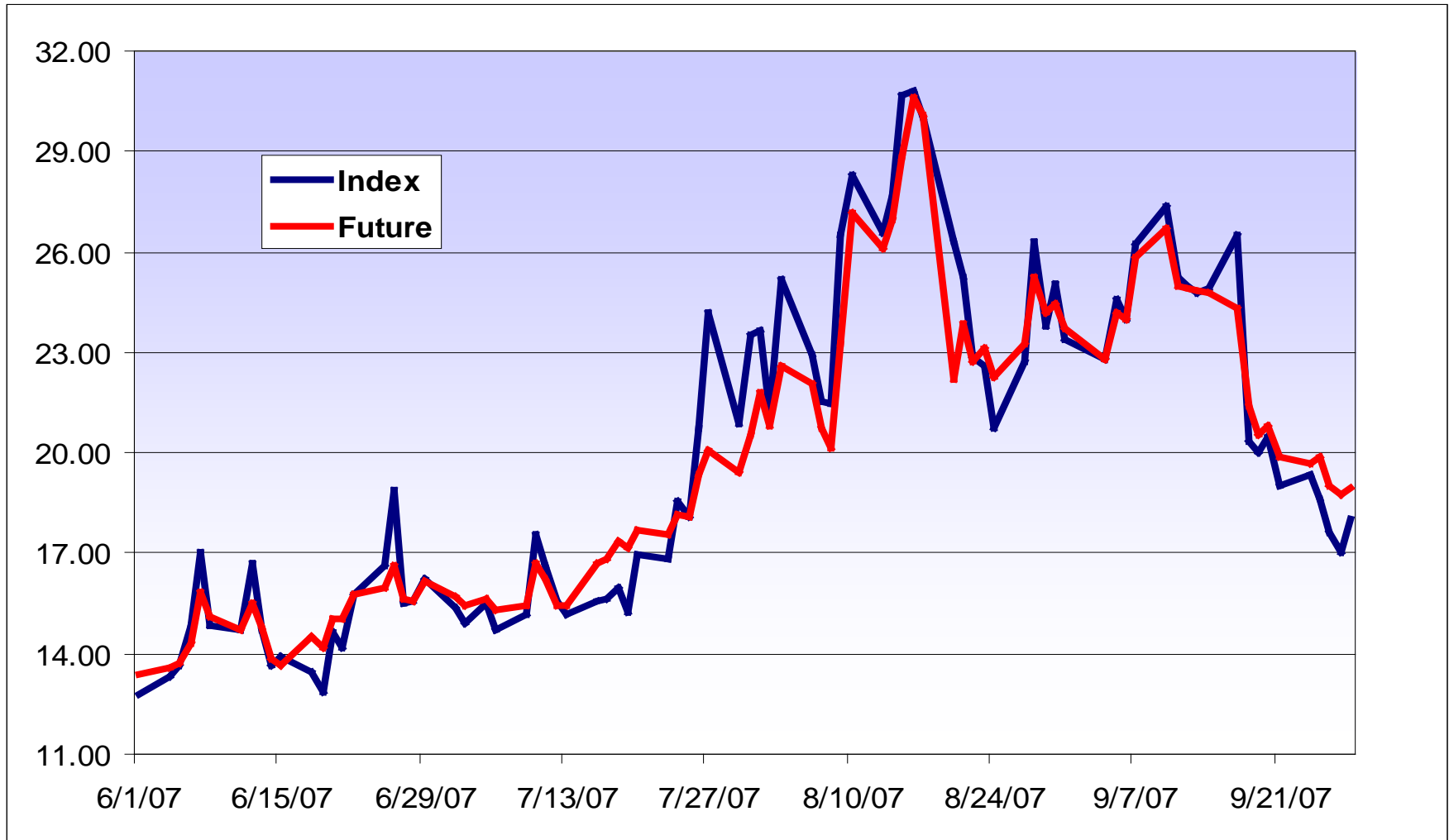
Unique Features –

Pricing is anticipatory, no ‘cost of carry’.

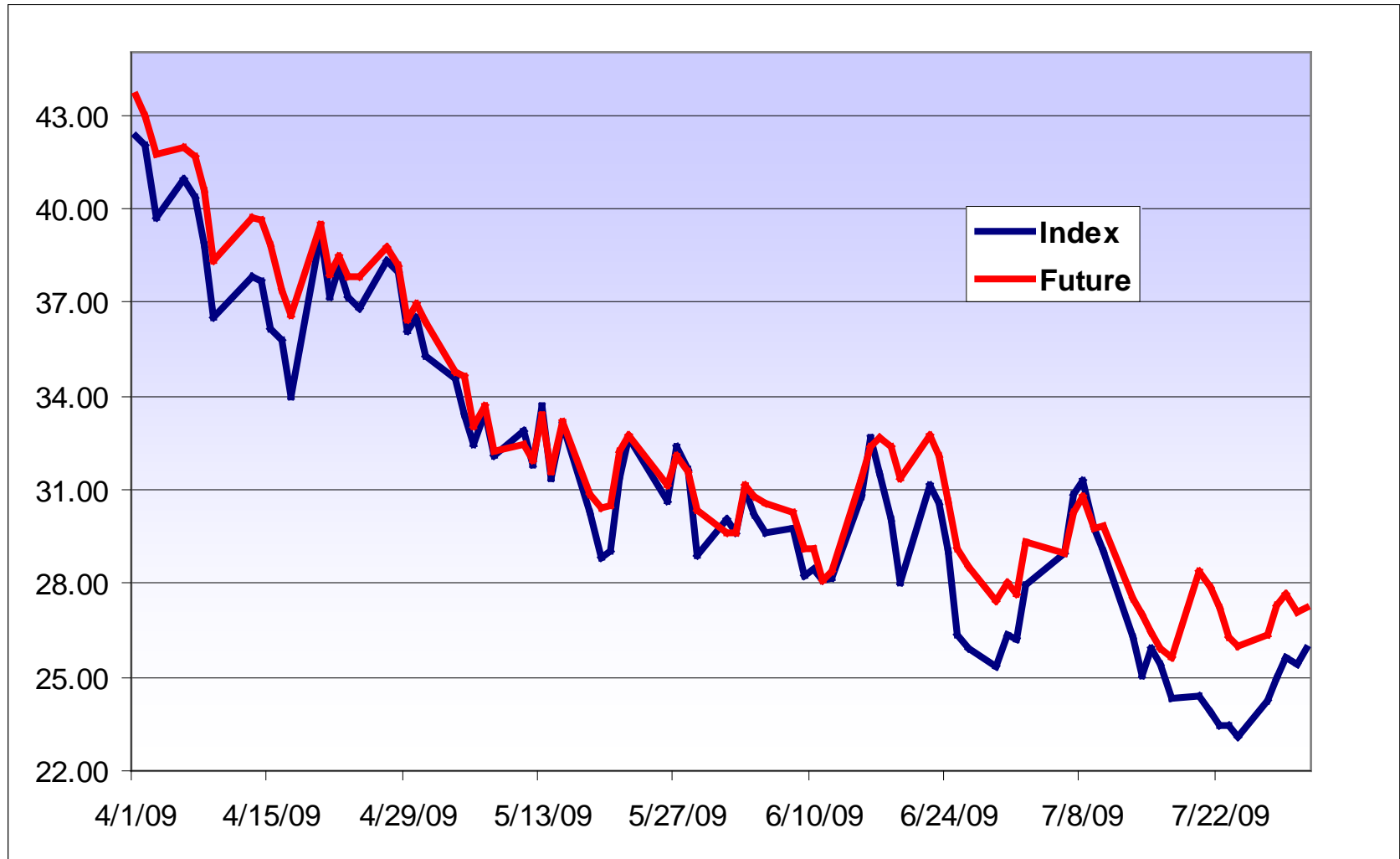
Future price reflects market opinion of the future direction of the spot VIX Index.

At times the VIX future price is higher than the index and at times it is lower.

VIX Futures



VIX Futures



10 Worst S&P 500 Days Since 2007

Date	SPX Change	VIX Front Month Future Change
10/15/2008	-9.03%	18.61%
12/1/2008	-8.93%	13.61%
9/29/2008	-8.81%	14.14%
10/9/2008	-7.62%	14.79%
11/20/2008	-6.71%	5.29%
11/19/2008	-6.12%	9.79%
10/22/2008	-6.10%	10.34%
10/7/2008	-5.74%	11.93%
1/20/2009	-5.28%	10.09%
11/5/2008	-5.27%	8.12%
11/12/2008	-5.19%	9.13%

VIX Futures Curve



- Taking VIX Index and VIX Futures prices a 'curve' of the pricing may be developed
- There is a typical shape to the curve with contracts that have more time to expiration having higher pricing
- This shape does not always hold up, but is prevalent in a 'normal' market environment

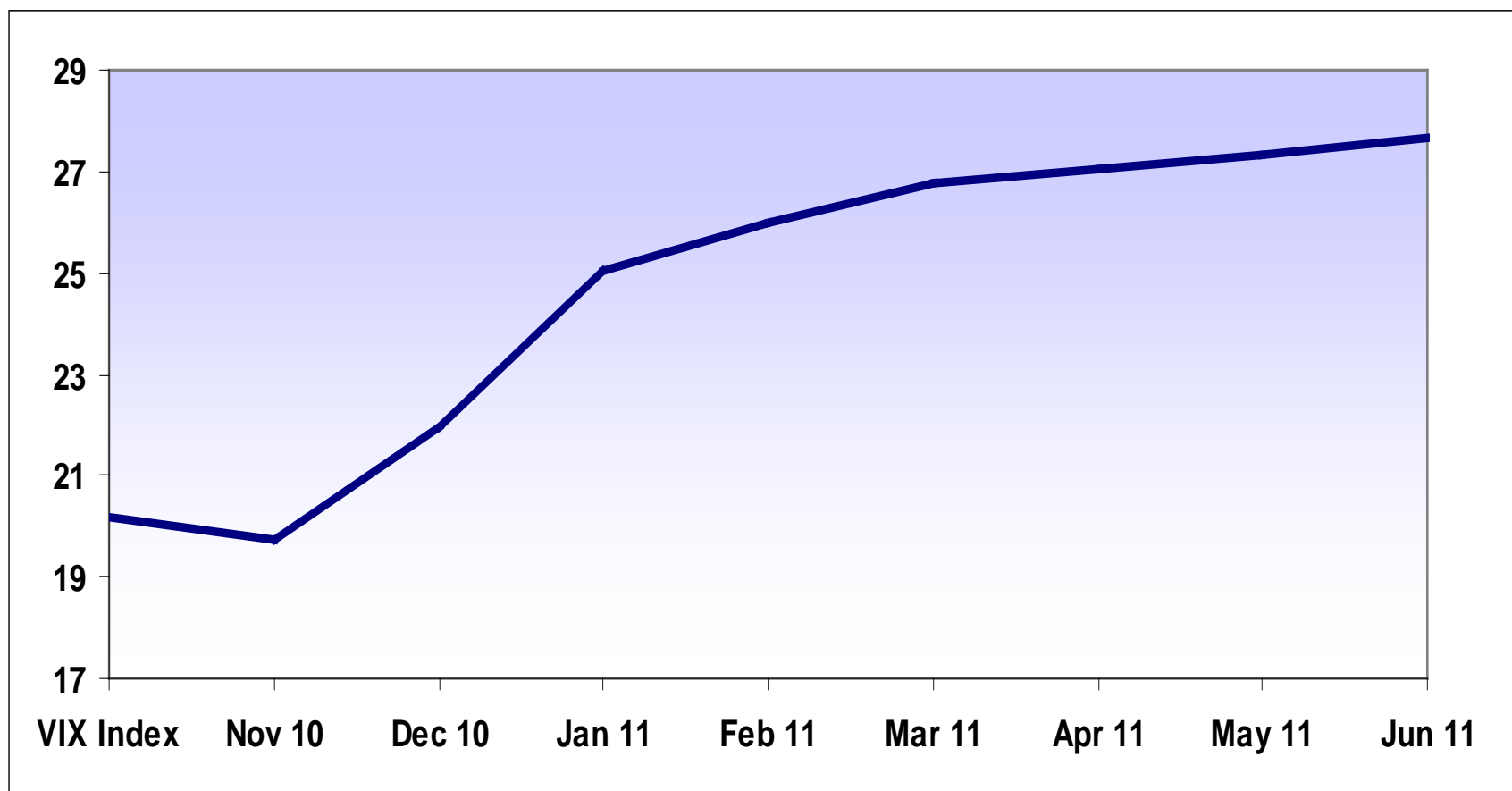
VIX Index and Futures Prices 11/15/10 -

	Close
VIX Index	20.20
Nov 10	19.75
Dec 10	21.95
Jan 11	25.05
Feb 11	26.00
Mar 11	26.75
Apr 11	27.05
May 11	27.35
Jun 11	27.65

VIX Futures Curve



VIX Index and Futures Prices 11/15/10 -



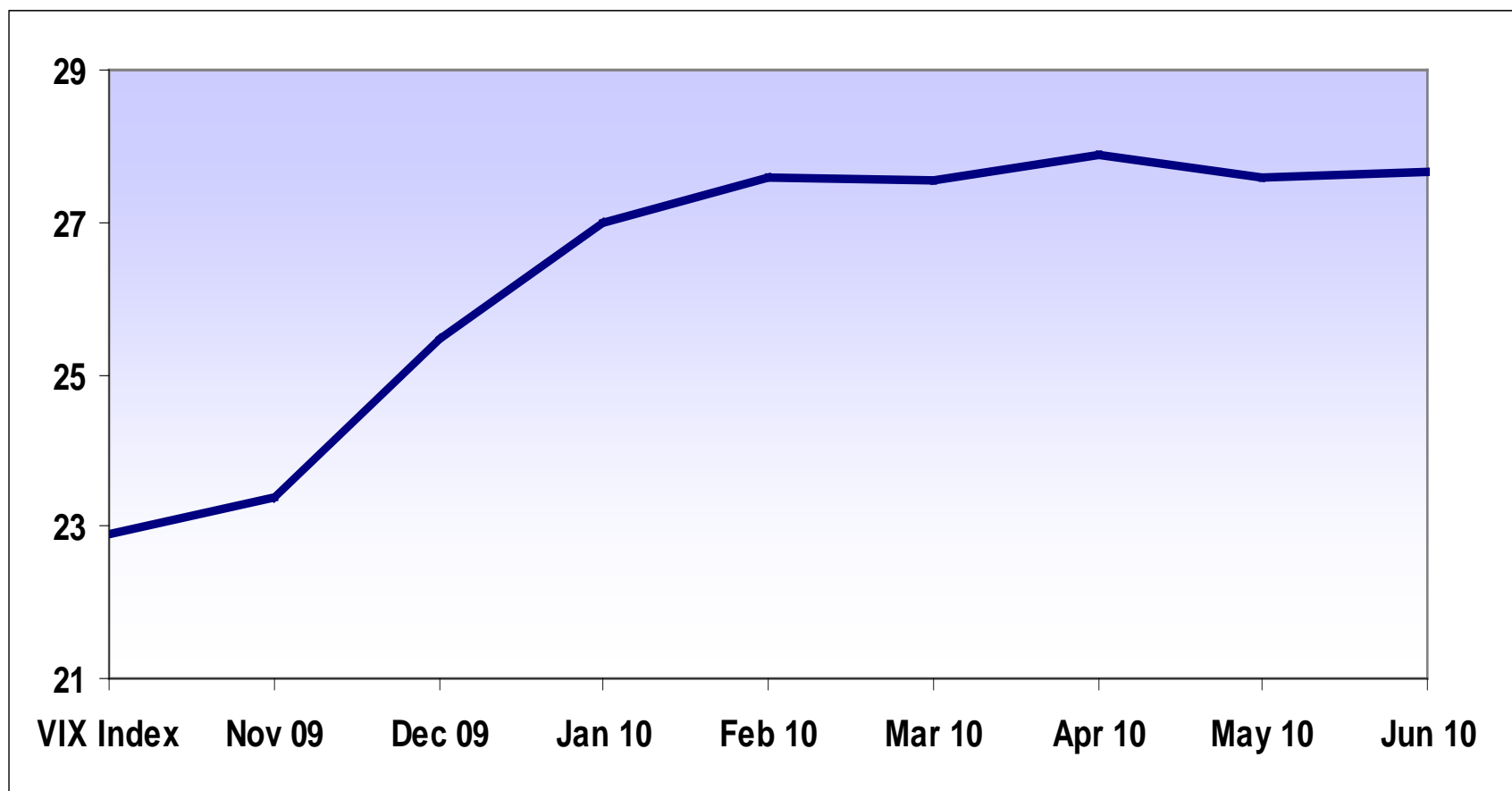
VIX Index and Futures Prices 11/16/09 -

	Close
VIX Index	22.89
Nov 09	23.40
Dec 09	25.45
Jan 10	27.00
Feb 10	27.60
Mar 10	27.55
Apr 10	27.90
May 10	27.60
Jun 10	27.65

VIX Futures Curve



VIX Index and Futures Prices 11/16/09 -



VIX Futures Curve



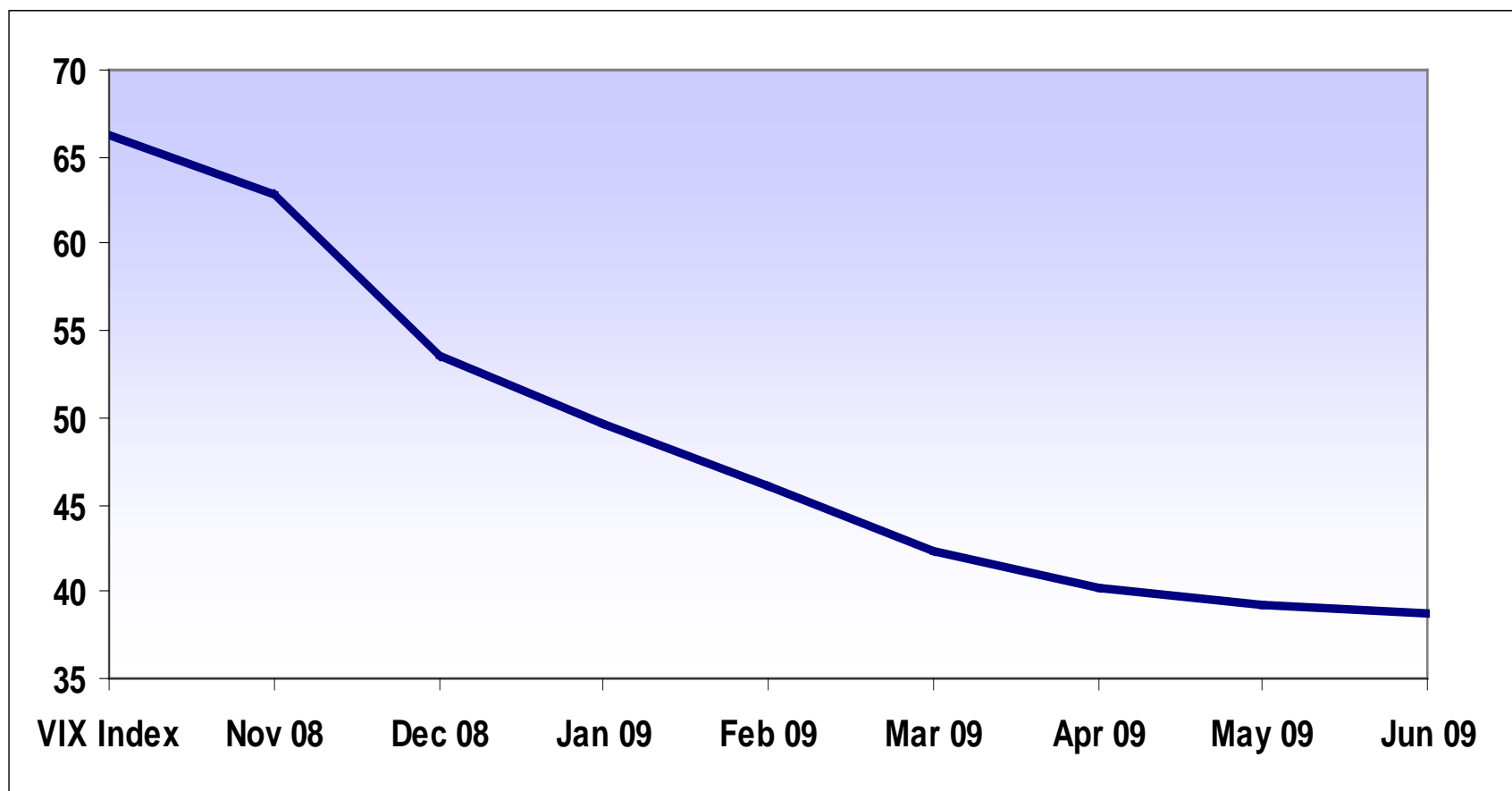
VIX Index and Futures Prices 11/14/08 -

	Close
VIX Index	66.31
Nov 08	62.90
Dec 08	53.51
Jan 09	49.66
Feb 09	46.09
Mar 09	42.35
Apr 09	40.13
May 09	39.28
Jun 09	38.82

VIX Calendar Spread

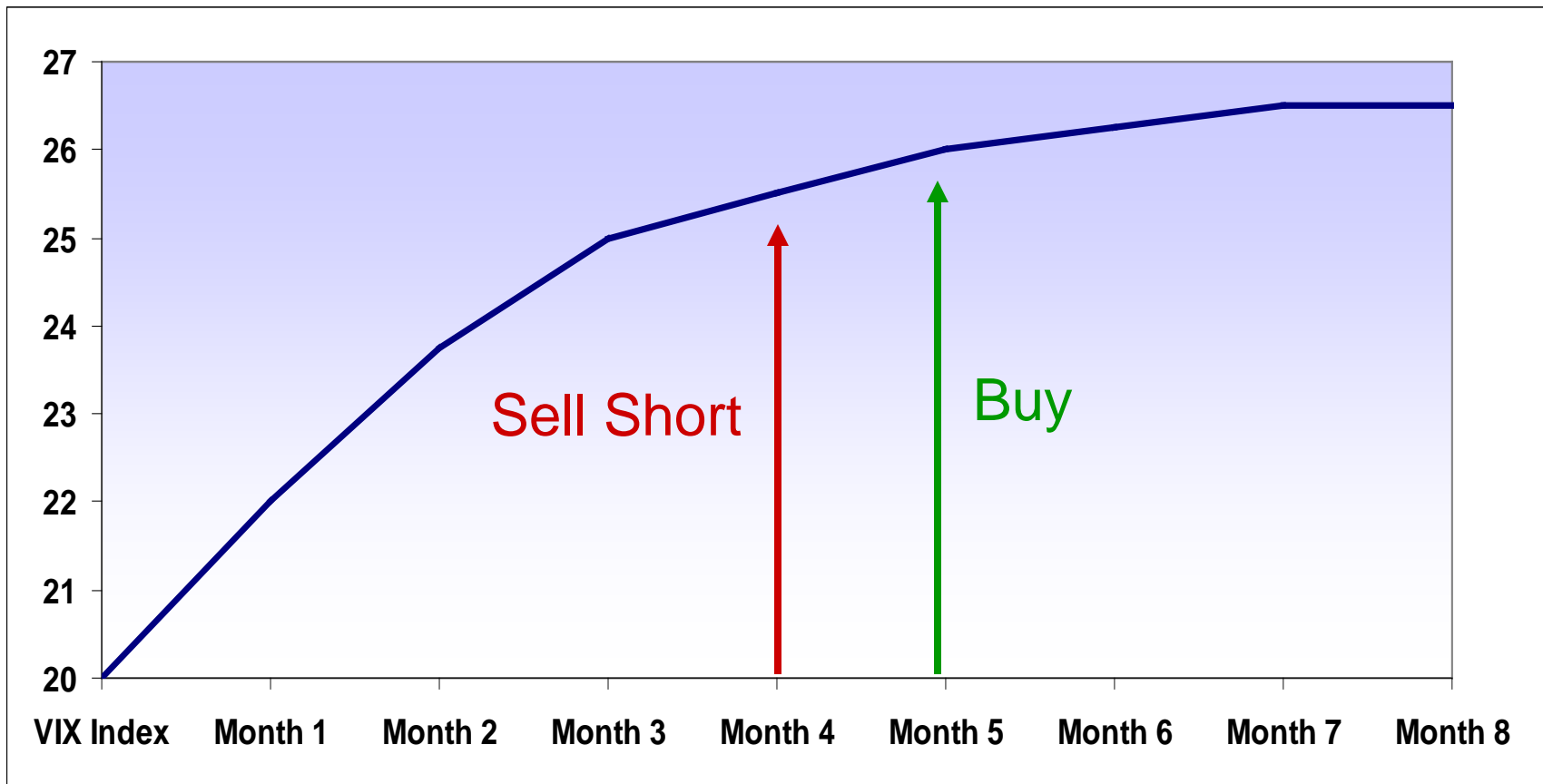


VIX Index and Futures Prices 11/14/08 -



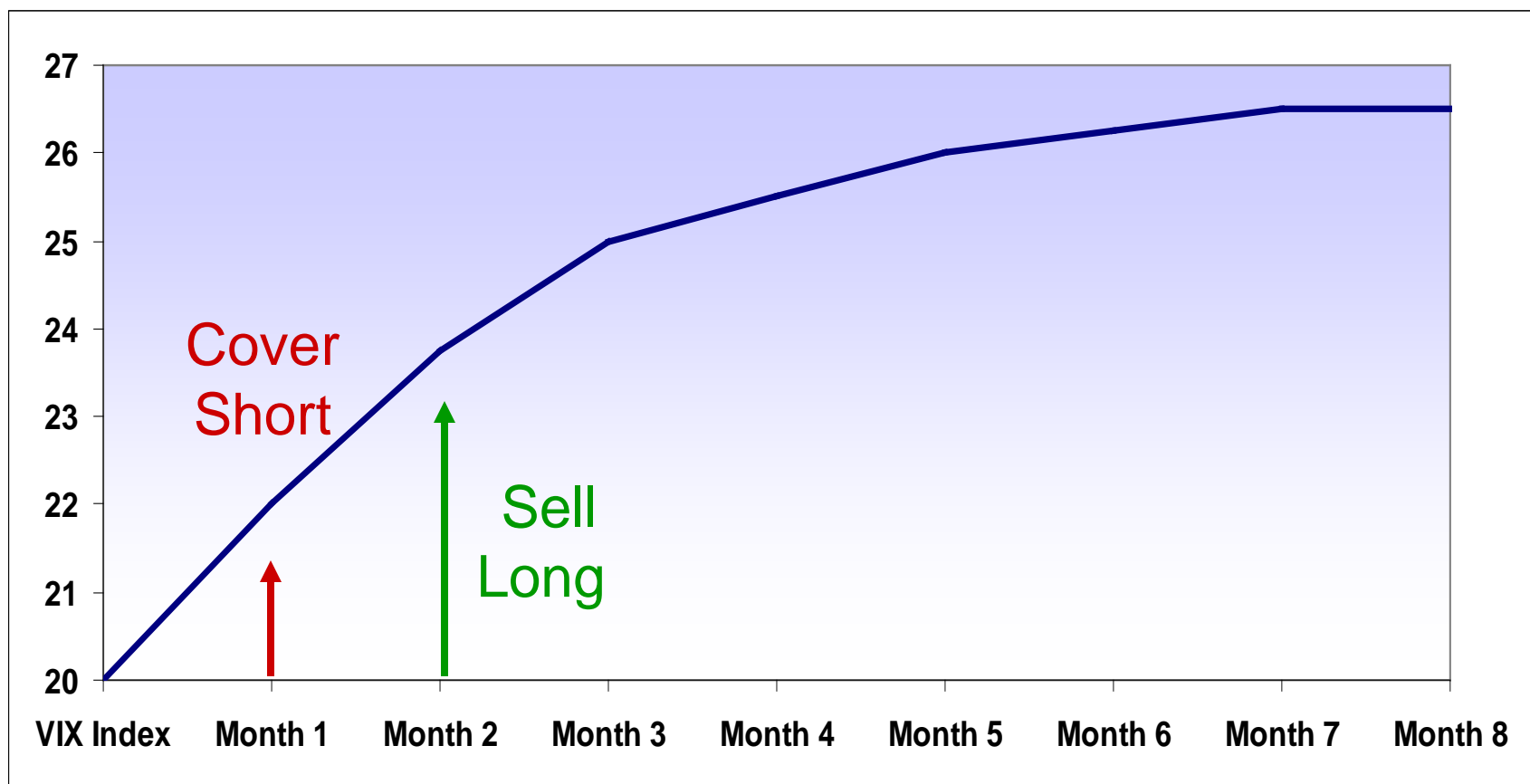
VIX Futures Curve

Typical Curve –



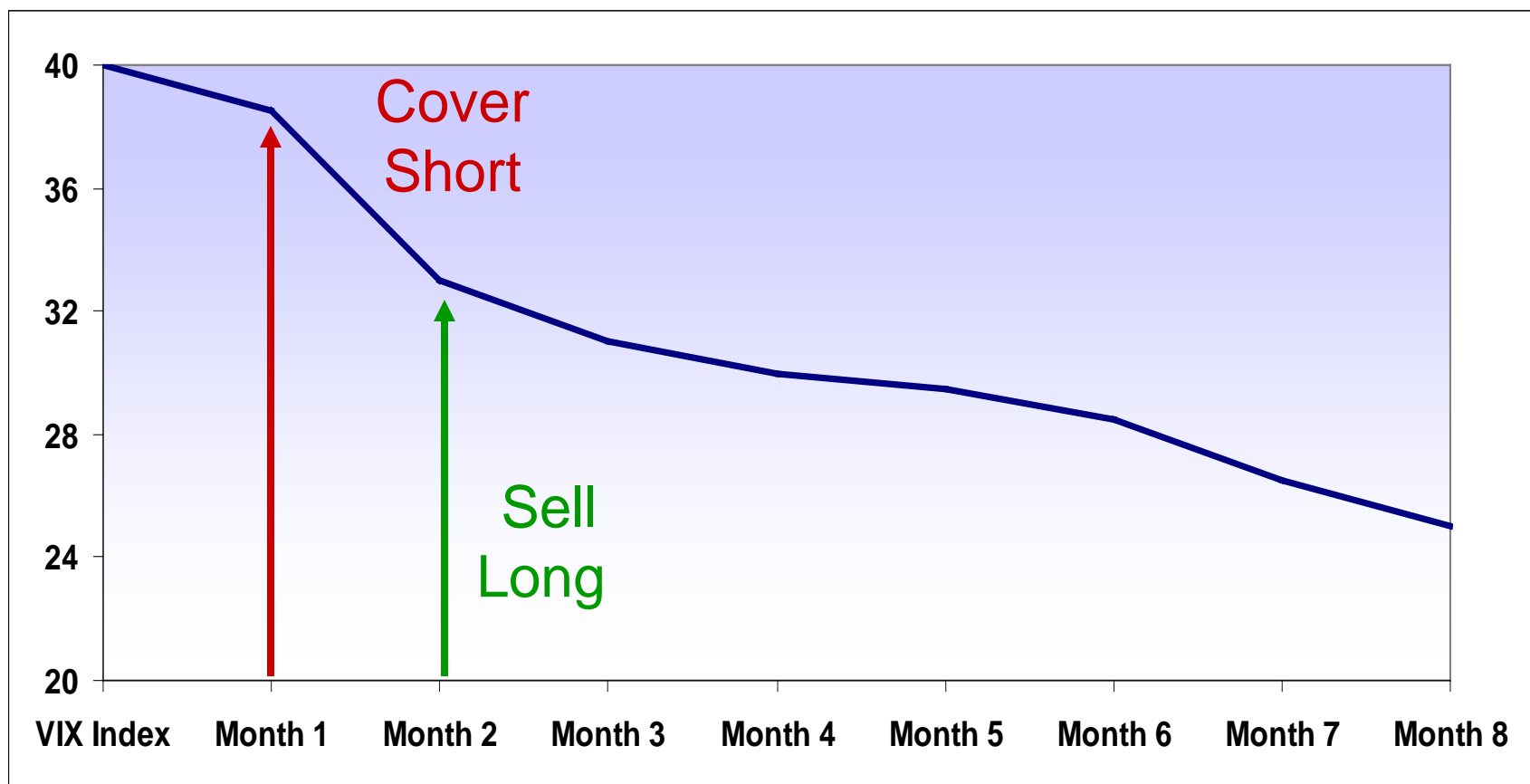
VIX Futures Curve

Four Months Later – Normal Curve



VIX Futures Curve

Four Months Later – Volatility Spike



- There is an inverse relationship between the VIX and the S&P 500
- Generally when the S&P 500 is under pressure the VIX moves higher
- This inverse relationship creates a wide variety of trading opportunities

University of Massachusetts Paper –

- Studied the 2008 market and the diversification benefits of VIX futures or options.
- Compared a variety of portfolios and combined exposure to the VIX.
- Results showed return and diversification benefits of including the VIX in a portfolio.

University of Massachusetts Paper –

Full study available on the CBOE website.

www.cboe.com/Institutional/reports.aspx

VIX Futures as a SPX Signal



From the 10 Worst Days -

Date	SPX Change	VIX Front Month Future Change
11/20/2008	-6.71%	5.29%

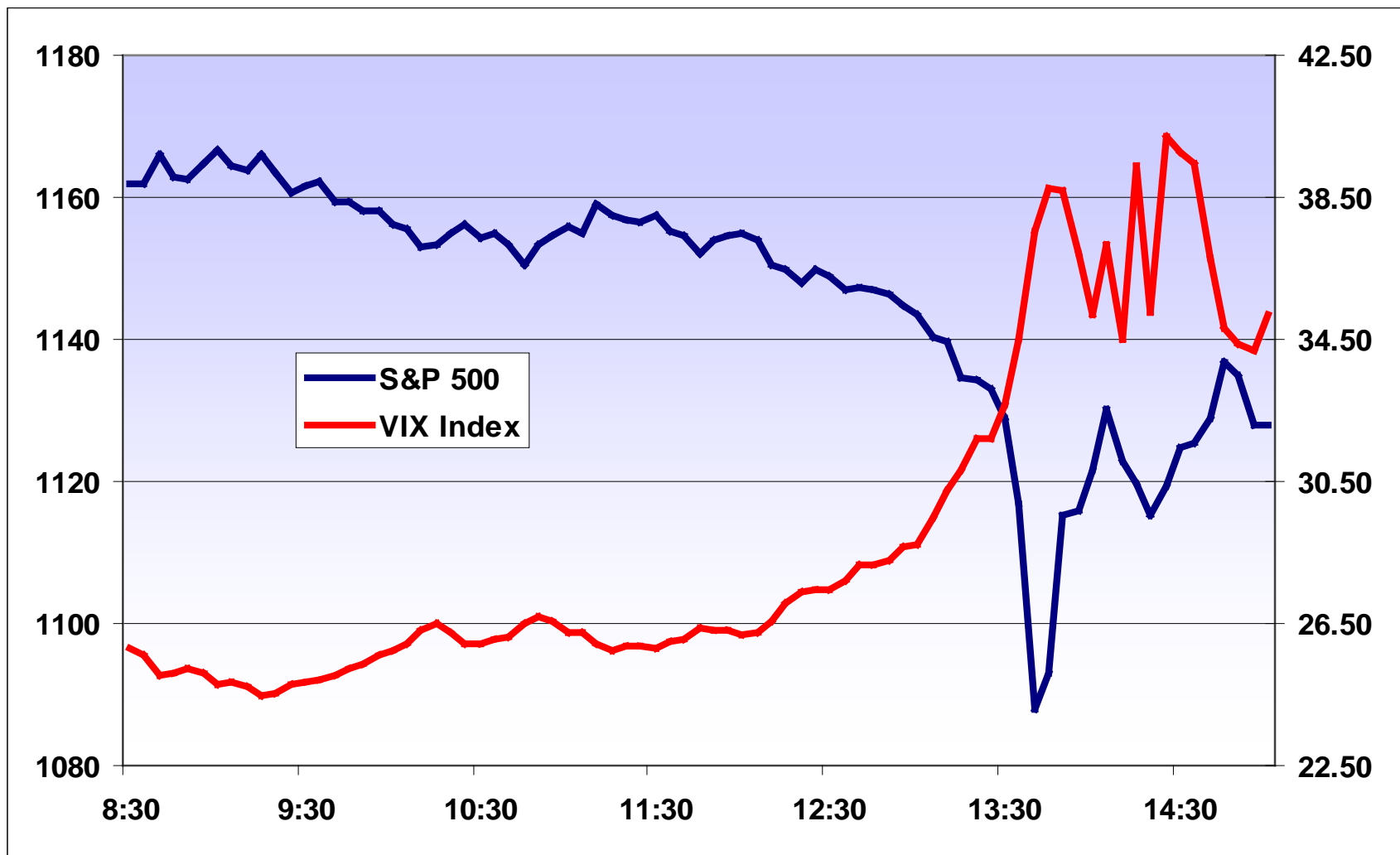
Guess What Happened the Next Few Days

Date	SPX Change
11/21/2008	+6.32%
11/24/2008	+6.47%
11/25/2008	+0.66%
11/26/2008	+3.53%

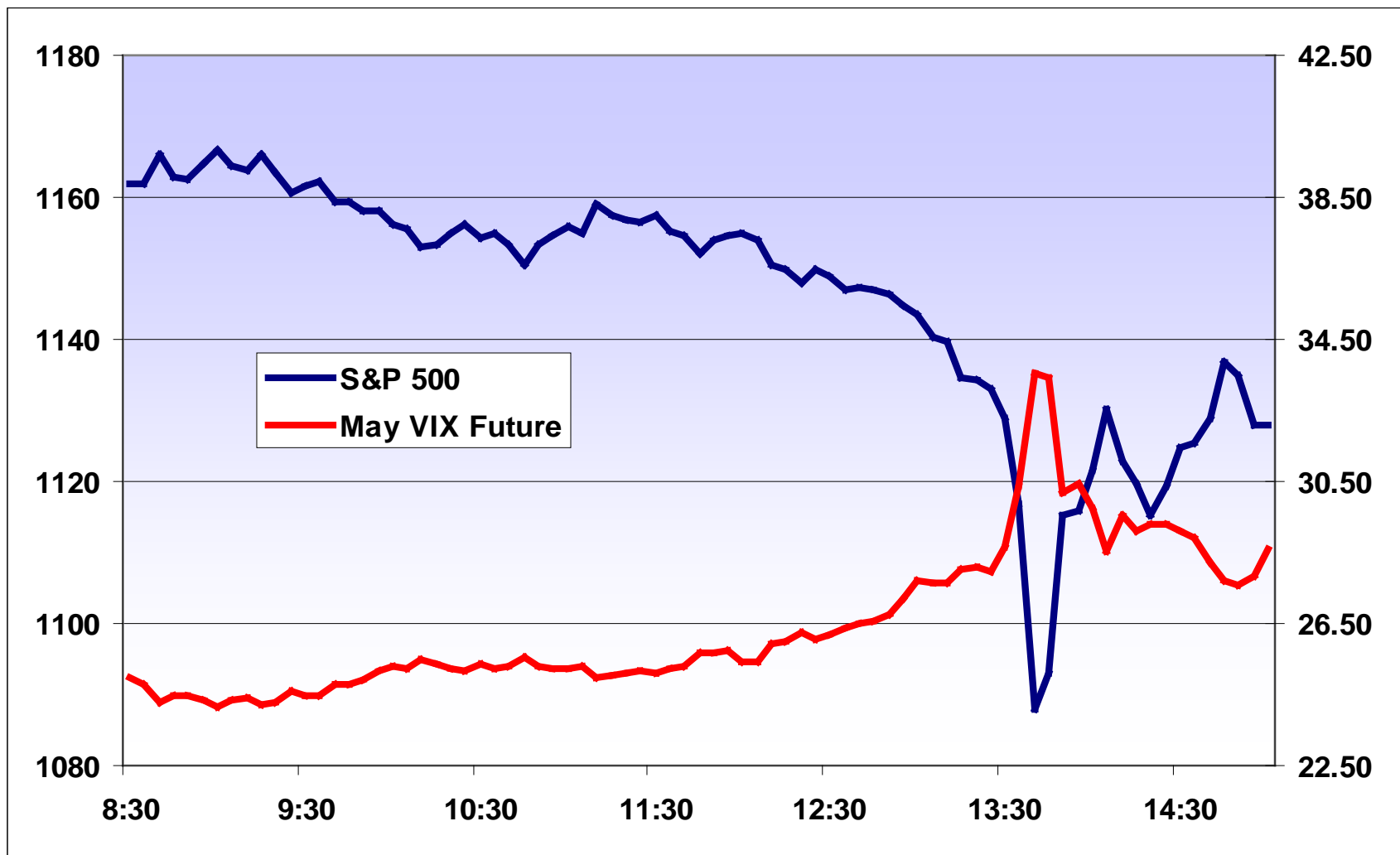
VIX vs. SPX



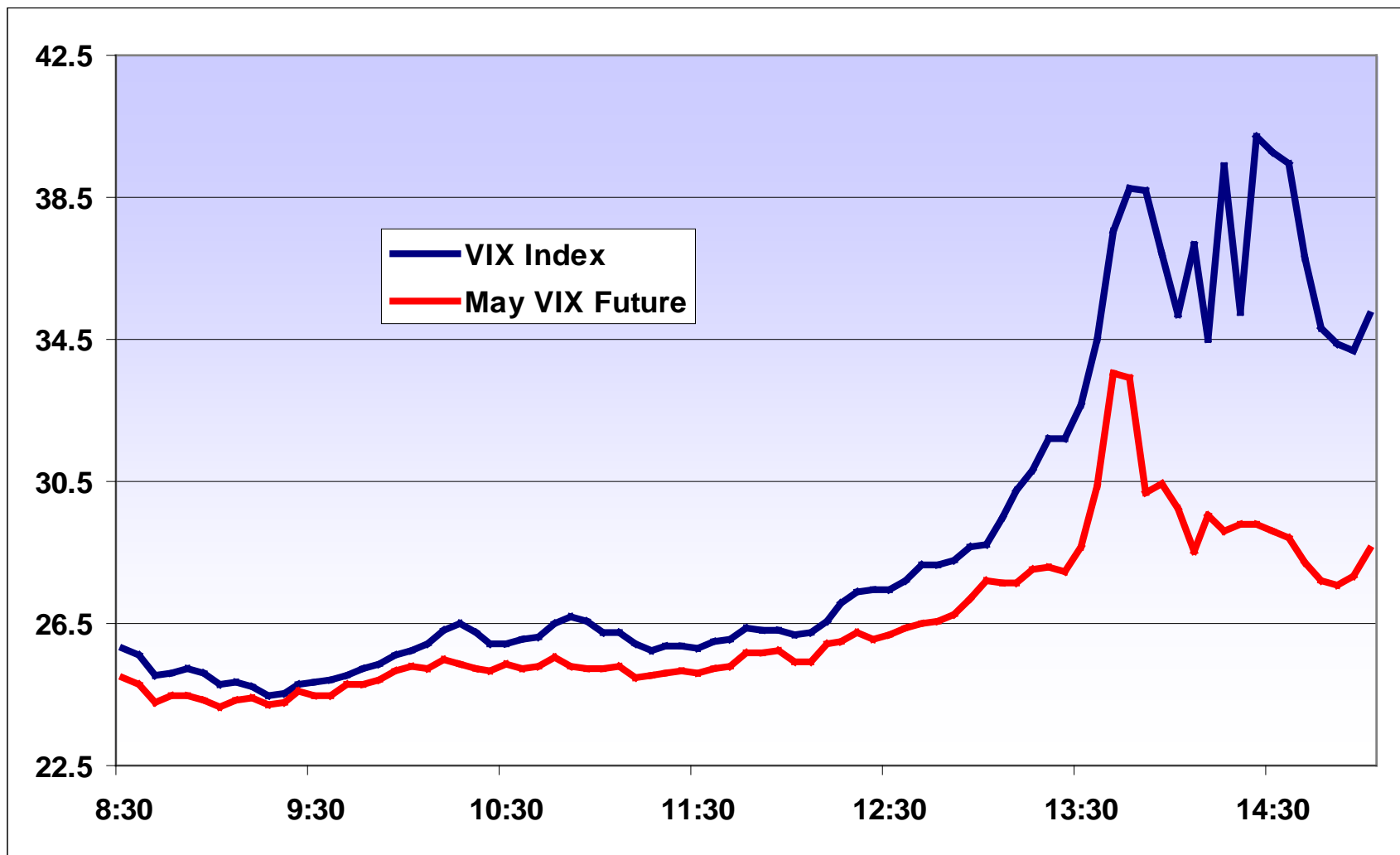
VIX vs. SPX – 5/6/2010 – 5 Min



VIX vs. SPX – 5/6/2010 – 5 Min



VIX vs. SPX – 5/6/2010 – 5 Min



- VIX Futures are 100% anticipatory
- There is an inverse relationship between the S&P 500 Index and the VIX
- Futures prices are based on the direction the market expects the VIX Index to settle at expiration
- Since futures anticipate the VIX they also indicate the market's expectation regarding the S&P 500

- The VIX often has a relationship (inverse) to the price changes in the S&P 500
- At times when you have an opinion regarding the S&P 500, using VIX futures may be a good alternative

- VIX Futures may be traded against each other to take advantage of the effect of time on each contract
- Some market observers use the VIX and VIX futures as a signal for the overall market
- The VIX and related futures may also be directionally traded based on an outlook for the overall stock market

Next Month

We will cover these three points in depth!

CBOE Volatility Index

www.cboe.com/vix

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