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**CBOE**<sup>®</sup>  
CHICAGO BOARD OPTIONS EXCHANGE

**VIX Index and VIX Option Trading**  
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The VIX<sup>®</sup> –

CBOE Volatility Index<sup>®</sup>.

Measures S&P 500<sup>®</sup> 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 – VIX exchange traded products (VXX)

2011 – GVZ Trading

2012 – VXEEM, VXEWZ, OVX, VXN Trading

## Original VIX –

- Based on S&P 100 Index Options (OEX)
- Used 8 option contracts
- Data going back to 1986
- Continues to be calculated
- Maintained and still quoted as VXO

## Current VIX –

- Introduced in 2003
- Changed to S&P 500 Index Options
- Expanded the number of contracts
- Opened path for derivative trading

VXO – VIX Correlation = 87.93%

- Statistically – about 75% of days the VIX and S&P 500 move in opposite directions
- This inverse relationship is rooted in behavioral finance
- The short term demand for options increases more in times of uncertainty



# VIX – S&P 500 Relationship

Daily Change Jan 1, 1990 – Jul 31, 2012

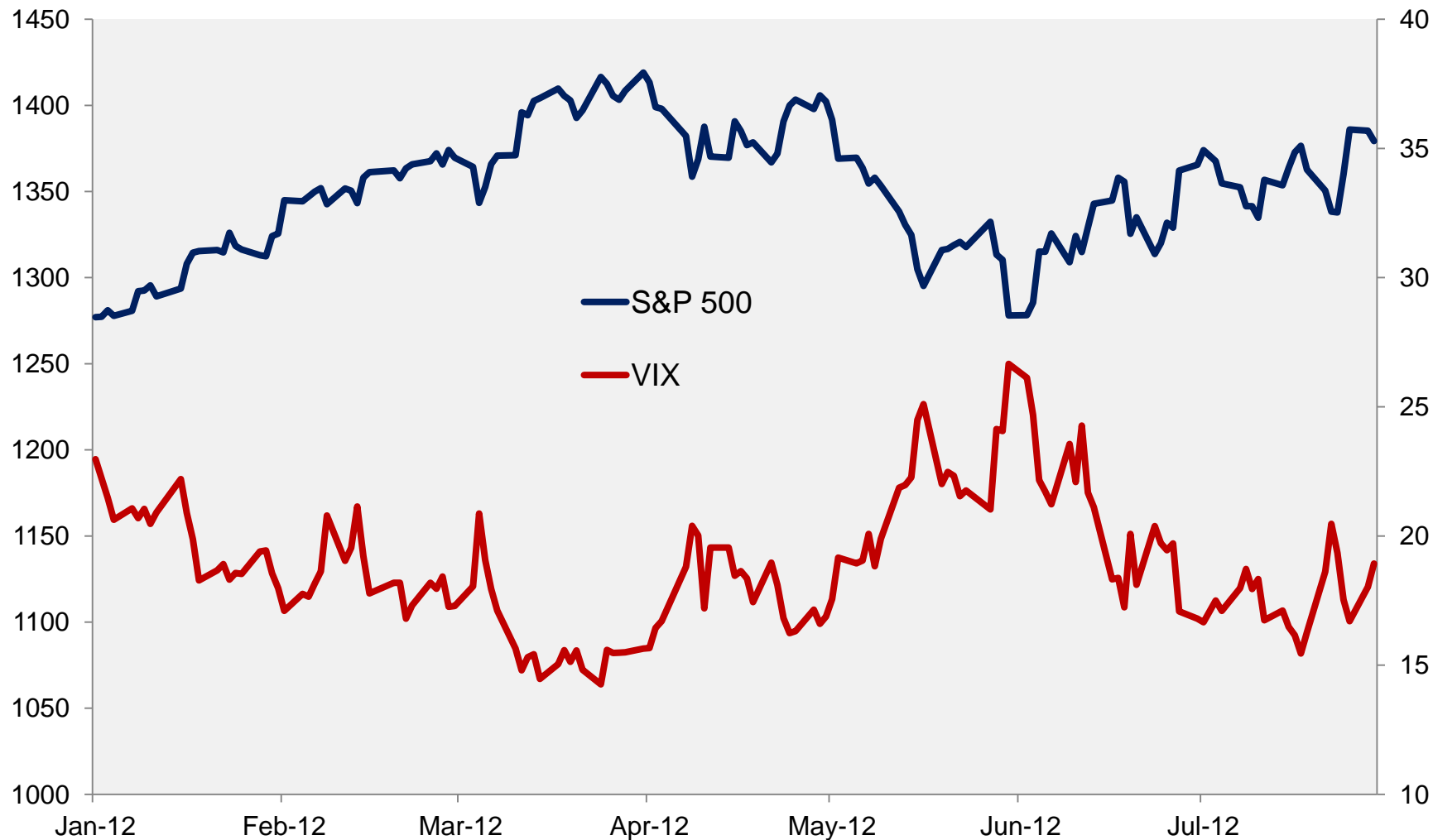
	1 Day	VIX Opposite	% Inverse
S&P 500 Higher	3024	2360	78.04%
S&P 500 Lower	2664	2042	76.65%
Total	5688	4402	77.39%

# VIX – S&P 500 Relationship

## 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%
8/8/2011	-6.66%	25.39%
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%

# VIX – S&P 500 Relationship



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 – S&P 500 Relationship



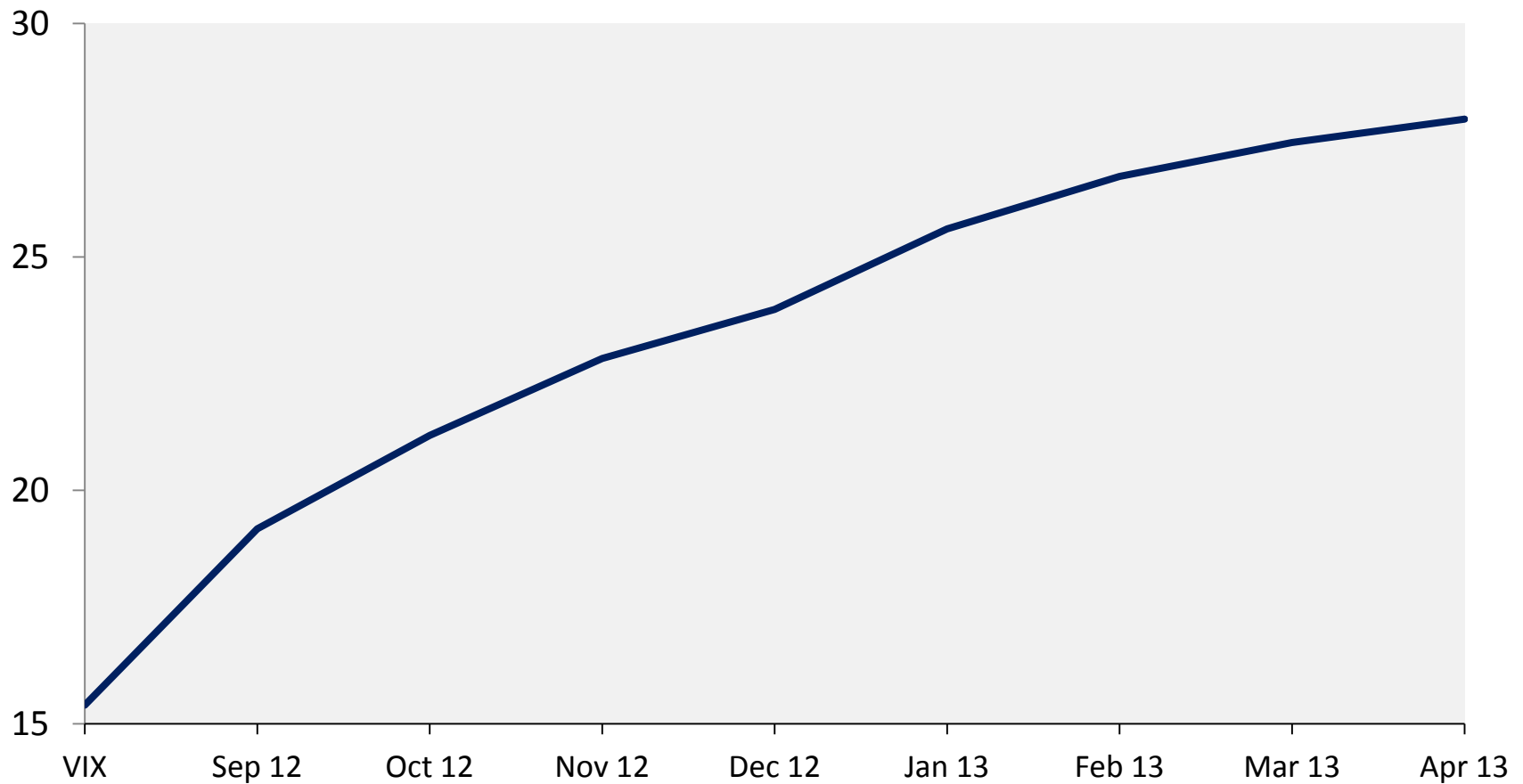
## VIX Futures –

- Introduced in 2004
- 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.

## VIX Futures (8/22/2012 – Mid-Day) –

VIX	15.40
Sep 12	19.15
Oct 12	21.15
Nov 12	22.87
Dec 12	23.85
Jan 13	25.55
Feb 13	26.70
Mar 13	27.40
Apr 13	27.90

## VIX Futures (8/22/2012 – Mid-Day) –





## VIX Options –

- Introduced in 2006
- Have gained wide acceptance among individual and institutional traders
- Becoming favored hedging vehicle for some institutions
- Index options, but closely related to VIX Futures

## Contracts –

- \$100 Multiplier
- European Style
- Unusual Pricing
- Wednesday Settlement
- Opening Price Quotation

10 Index Options = 1 Futures Contract

## European Style –

European options are only allowed to be exercised on expiration.

VIX options are cash settled at expiration.

## Unusual Pricing –

It is not uncommon for VIX options to appear to be cheap or expensive when using the VIX Index as the underlying.

The best underlying instrument should be the corresponding VIX future price.

## Unusual Pricing –

VIX Index @ 22.00

VIX February 20.00 Call @ 1.25

$$22.00 - 20.00 = 2.00$$

VIX February Future @ 20.50

## Unusual Pricing –

VIX Index @ 22.50

VIX March 25.00 Put @ 1.50

$$25.00 - 22.50 = 2.50$$

VIX March Future @ 24.00

8/22/2012 – Mid-Day –

- VIX @ 15.40 / Nov VIX @ 22.80
- Believe market will remain calm into end of year
- Result would be unchanged or lower VIX
- Take a look at Nov VIX Puts

# VIX Option Trade

VIX @ 15.40 / Nov VIX @ 22.80 –

Strike	Bid	Ask
16	0.40	0.50
17	0.70	0.80
18	1.05	1.15
19	1.50	1.55
20	1.95	2.05
21	2.50	2.60
22	3.10	3.20
23	3.70	3.90
24	4.40	4.50
25	5.10	5.20



# VIX Option Trade

VIX @ 15.40 / Nov VIX @ 22.80 –

Strike	Bid	Ask	P/L @ 15.40	% Return
16	0.40	0.50	0.10	20%
17	0.70	0.80	0.80	100%
18	1.05	1.15	1.45	126%
19	1.50	1.55	2.05	132%
20	1.95	2.05	2.55	124%
21	2.50	2.60	3.00	115%
22	3.10	3.20	3.40	106%
23	3.70	3.90	3.70	95%
24	4.40	4.50	4.10	91%
25	5.10	5.20	4.40	85%

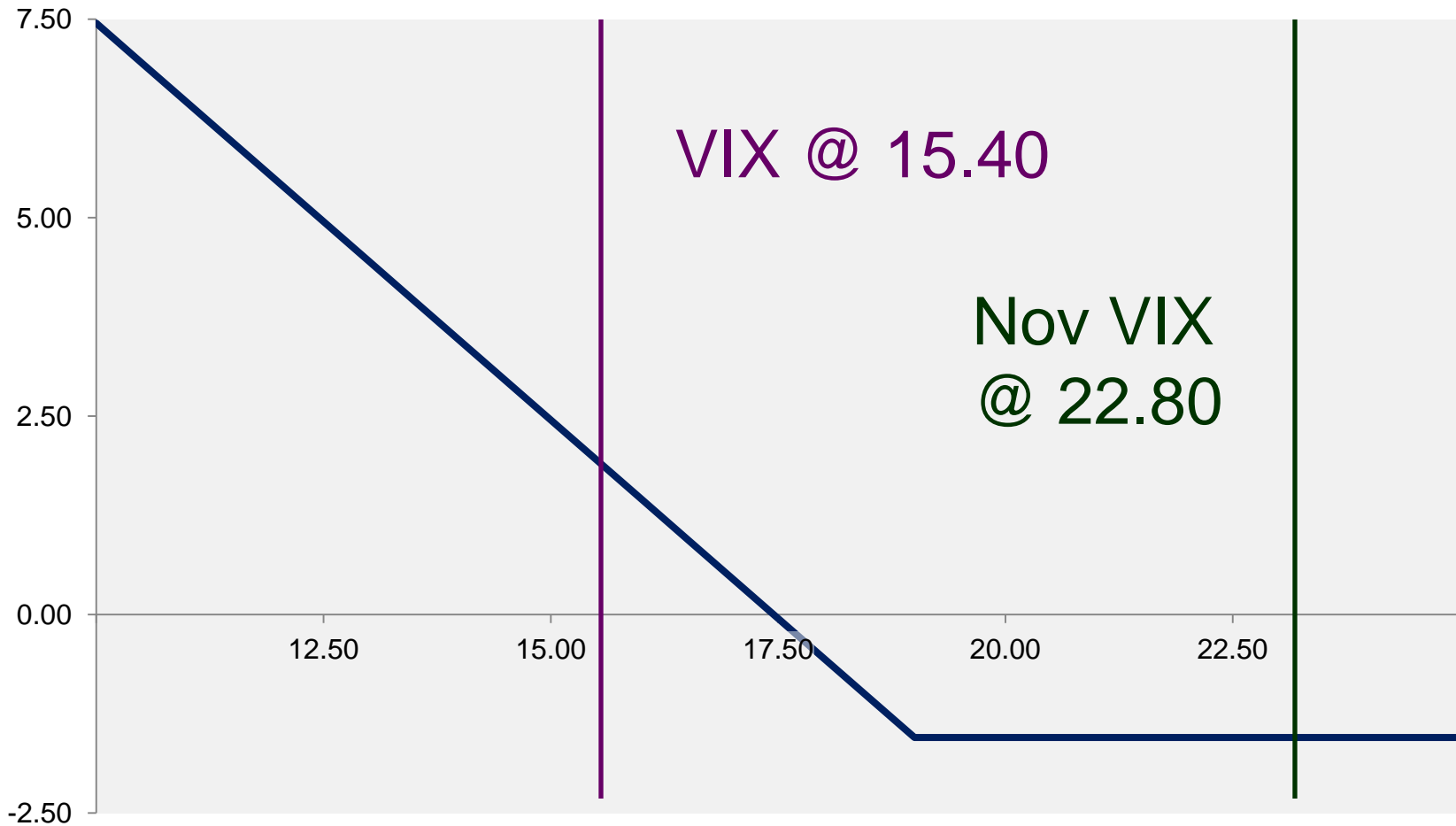
# VIX Option Trade

Long 1 VIX Nov 19 Put –

VIX Settlement	VIX Nov 19 Put	Premium	P/L
15.00	4.00	(1.55)	2.45
17.00	2.00	(1.55)	0.45
19.00	0.00	(1.55)	(1.55)
21.00	0.00	(1.55)	(1.55)
23.00	0.00	(1.55)	(1.55)

# VIX Option Trade

## Long 1 VIX Nov 19 Put –



Fiscal Cliff Trade #1 – It gets resolved

Seller of 35,000 VIX Jan 20 Calls @ 2.55

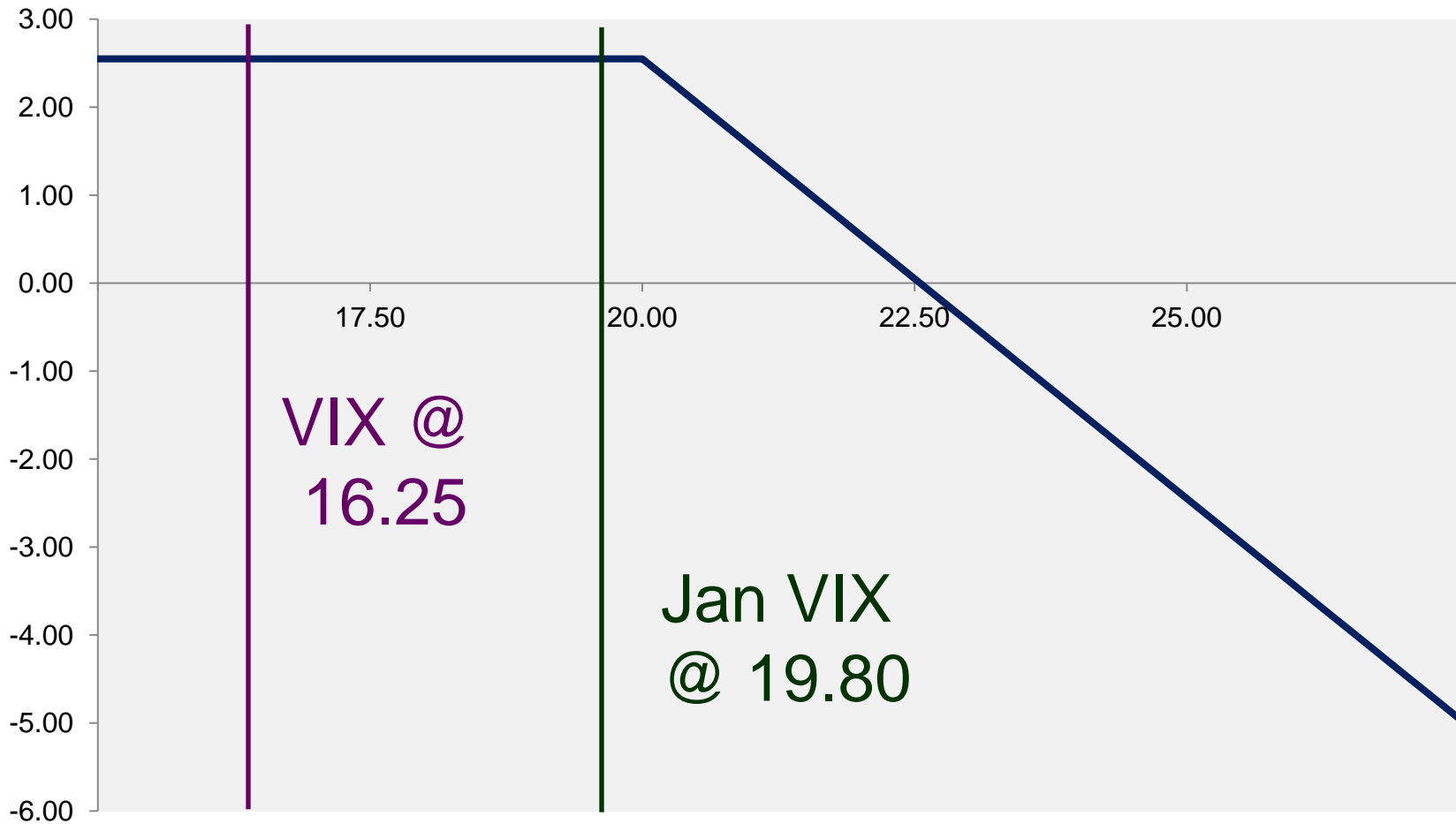
# Current VIX Trades

## Fiscal Cliff #1 – Short VIX Jan 20 Call @ 2.55

VIX Settlement	VIX Jan 20 Call	Income	P/L
16.00	0.00	2.55	2.55
18.00	0.00	2.55	2.55
20.00	0.00	2.55	2.55
22.00	(2.00)	2.55	0.55
24.00	(4.00)	2.55	(1.45)

# Current VIX Trades

## Fiscal Cliff #1 – Short VIX Jan 20 Call @ 2.55



Fiscal Cliff Trade #2 – We fall off –

Buy 50,000 VIX Jan 25 Calls @ 1.50

Sell 50,000 VIX Jan 35 Calls @ 0.50

Net Cost = 1.00

# Current VIX Trades

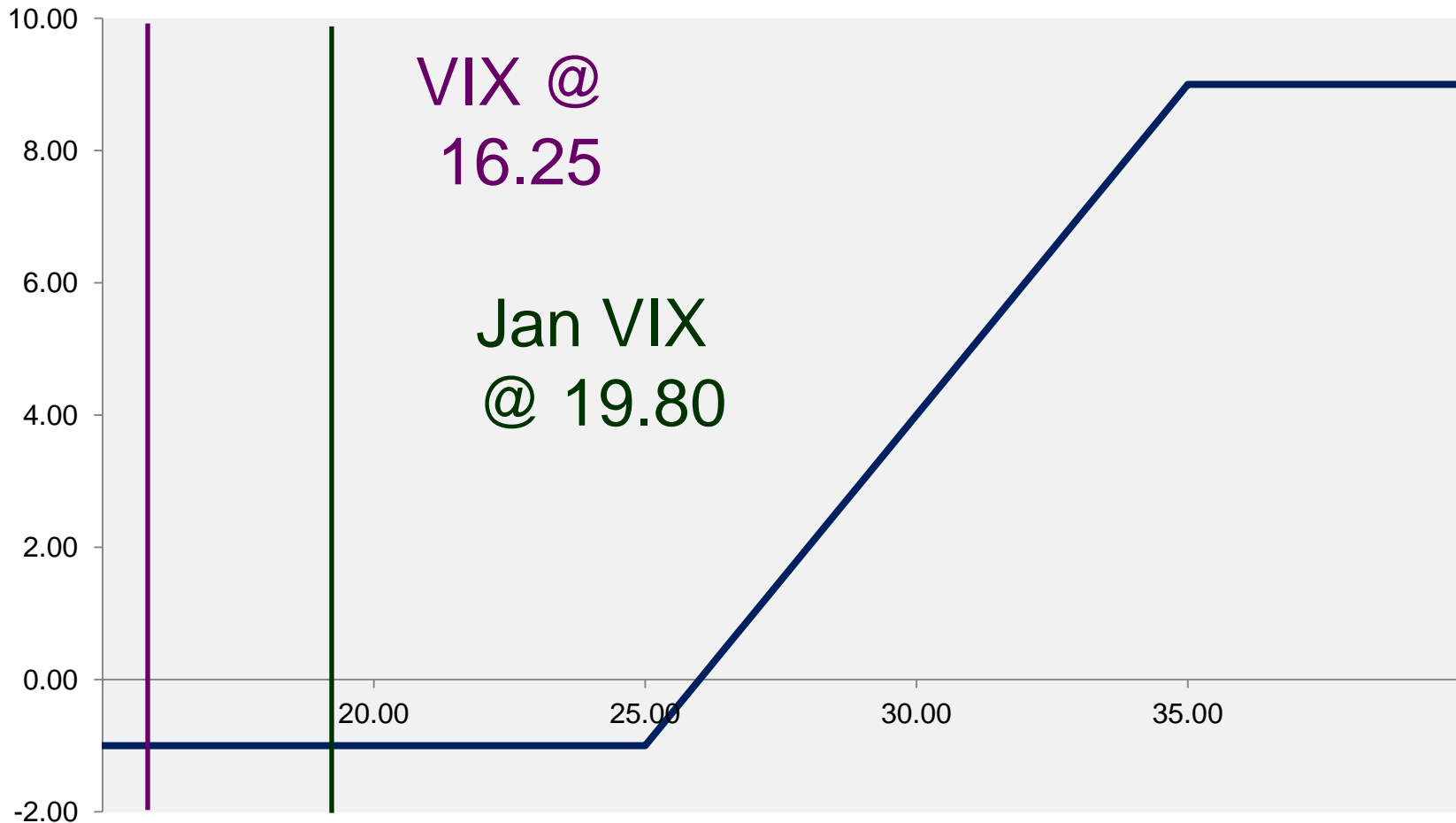


## Fiscal Cliff #2 – VIX Jan 25/35 Call Spread

VIX Settlement	VIX Jan 25 Call	VIX Jan 35 Call	Cost	P/L
15.00	0.00	0.00	(1.00)	(1.00)
20.00	0.00	0.00	(1.00)	(1.00)
25.00	0.00	0.00	(1.00)	(1.00)
30.00	5.00	0.00	(1.00)	4.00
35.00	10.00	0.00	(1.00)	9.00
40.00	15.00	(5.00)	(1.00)	14.00



## Fiscal Cliff #2 – VIX Jan 25/35 Call Spread



- VIX is an very unique trading vehicle relative to any other market
- It is possible to use the VIX and VIX futures as an indicator or market sentiment
- Also, due to the nature of VIX option pricing, it is possible to have a long option position that benefits from the passage of time

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