

VOLATILITY INDEXES at CBOE

Premier Barometers of Investor Sentiment and Market Volatility

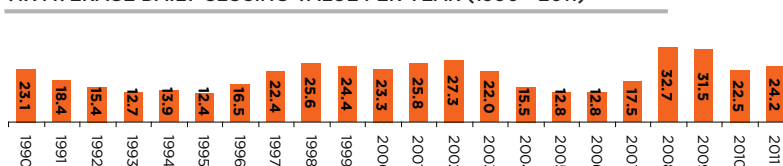
Options

Futures

The Chicago Board Options Exchange® (CBOE®) calculates and updates the values of more than a dozen volatility indexes designed to measure the 30-day implied volatility of different securities. These volatility indexes are key measures of market expectations of near-term volatility conveyed by listed option prices. Futures and options contracts now are available on some of these volatility indexes.

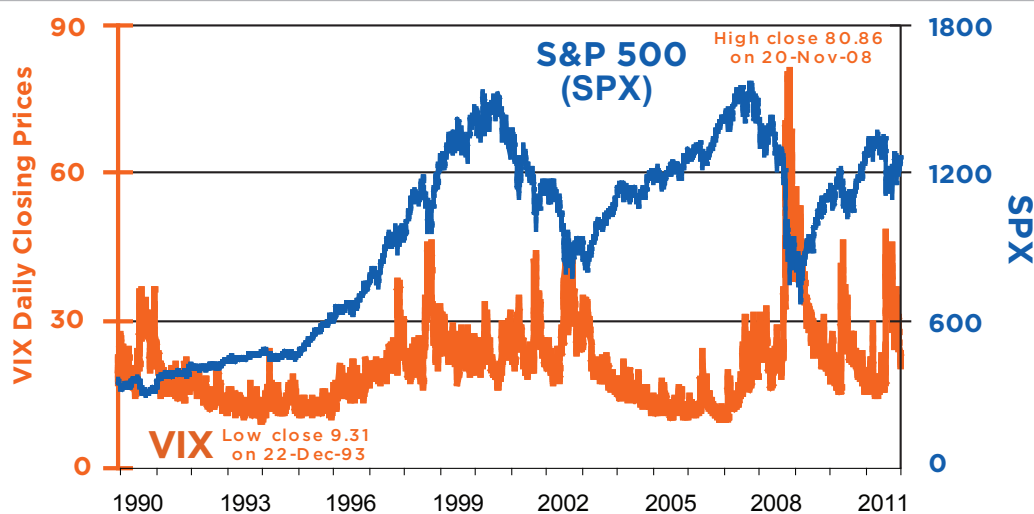
CBOE Volatility Index® (VIX®), based on S&P 500 Index Options, is considered by many to be the world's premier barometer of investor sentiment and market volatility. www.cboe.com/vix

VIX AVERAGE DAILY CLOSING VALUE PER YEAR (1990 - 2011)



Sources: CBOE and Bloomberg

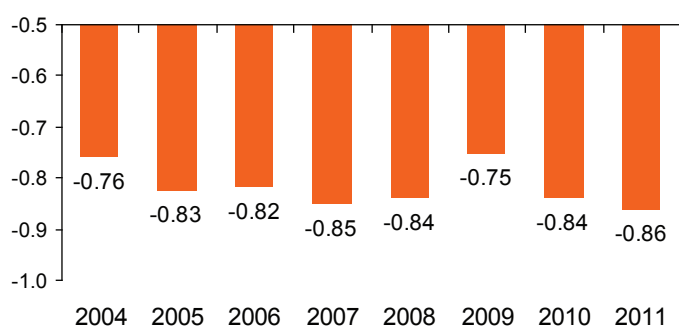
VIX AND S&P 500® INDEXES (1990 - 2011)



Sources: CBOE and Bloomberg

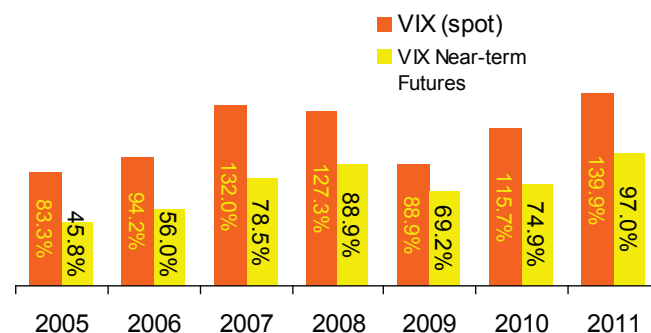
Many investors are intrigued by the VIX Index because it has a negative correlation of returns vs. many other stock indexes. The high volatility of VIX is attractive to many traders and investors.

NEGATIVE CORRELATIONS
for Daily Returns of VIX vs. S&P 500



Sources: CBOE and Bloomberg

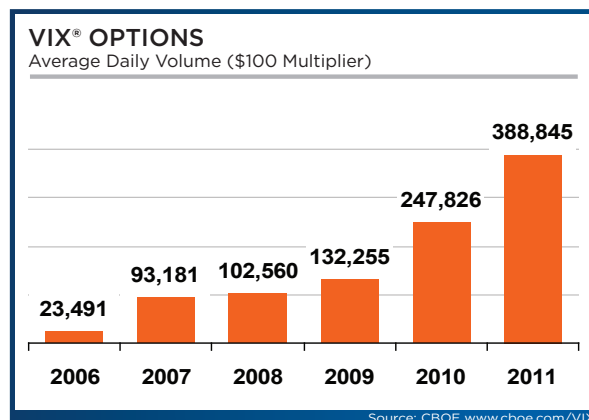
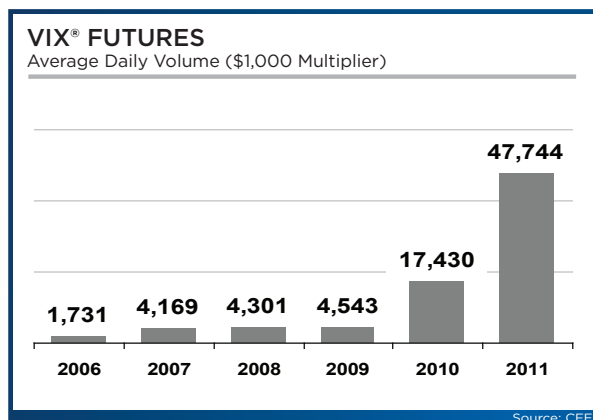
HIGH VOLATILITY OF VOLATILITY
Historic Volatility of Daily Returns



Source: CBOE

FUTURES AND OPTIONS ON THE VIX INDEX

In the years following the 1993 introduction of the VIX Index, many investors inquired about the investability of the VIX Index. VIX futures were launched in 2004 and VIX options began trading in 2006. Investors are cautioned that they should study the pricing of VIX futures and options before investing (please visit www.cboe.com/VIX and see the Pricing graphs at the bottom of this page).



KEY SPECIFICATIONS

	VIX FUTURES	VIX OPTIONS
Exchange	CFE	CBOE
Ticker	VX	VIX
Multiplier	\$1000 (and \$100 for Mini-VIX Futures)	\$100
Last Day of Trading	Generally on Tuesday, the day before expiration date.	
Expiration Date	Generally on Wednesday 30 days prior to the 3rd Friday of calendar month immediately following the expiring month.	
Avg. Daily Volume in 2011	47,744	388,845
Open Interest (December 2011)	125,881	3,100,814

SAMPLE VIX STRATEGIES

Investors who are - Bullish on VIX, and Bearish on stocks - might consider -*

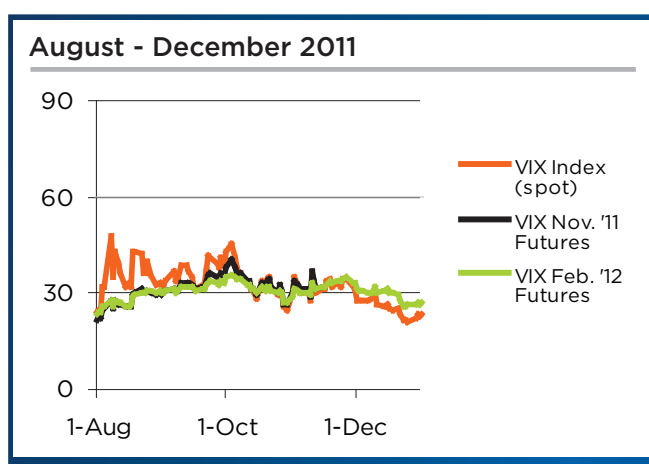
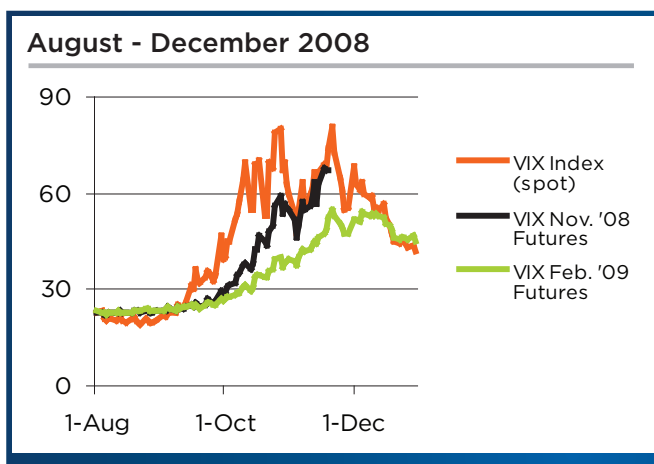
- Long VIX Call Options
- Long VIX Call Spreads
- Short VIX Put Credit Spreads
- Long VIX Futures

Investors who are - Bearish on VIX, and Bullish on stocks - might consider -*

- Long VIX Put Options
- Long VIX Put Spreads
- Short VIX Call Credit Spreads
- Short VIX Futures

** Caution - sometimes VIX and stock prices move in the same direction. Please visit www.cboe.com/VIX for more information about prices and strategies.*

PRICING FOR VIX SPOT AND SELECT VIX FUTURES - Daily Closing Values in Late 2008 and Late 2011



Valuations of VIX Futures and Options are based on expected values of VIX at expiration, rather than the current, or "spot" VIX value. This explains why VIX Futures and Options do not move in lock step with the spot VIX. Note that:

- On November 20, 2008 -- the VIX Index (spot) reached its highest daily close of 80.86, but the VIX Feb. 2009 futures were priced at 54.67 (reflecting investors' expectations of the value of VIX three months in the future).
- On August 8, 2011 -- the VIX Index (spot) rose 50%, the VIX Aug. 2011 futures rose 25%, and the VIX Nov. 2011 futures were up 10%.

PORTFOLIO MANAGEMENT WITH VIX FUTURES AND OPTIONS

In 2009 a paper entitled “VIX Futures and Options: A Case Study of Portfolio Diversification During the 2008 Financial Crisis” was published in The Journal of Alternative Investments and it found that “investable VIX products could have been used to provide some much needed diversification during the 2008 financial crisis.” The paper analyzed the impact of an addition of VIX futures and options to a portfolio. Here are two graphs from the paper --

Figure 2: Portfolio Performance with VIX Futures Mar. 2006 to Dec. 2008

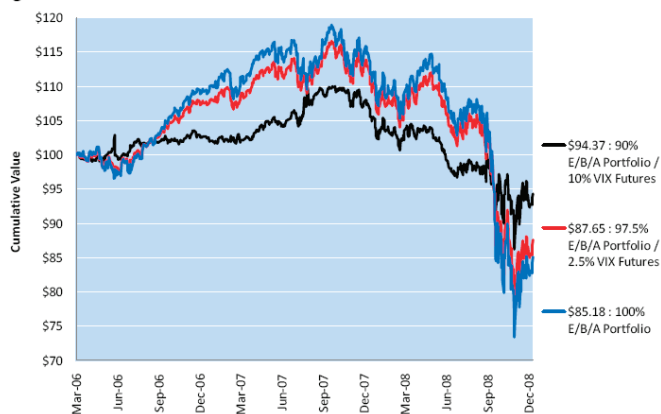


Figure 2: With a 10% allocation of VIX futures to the Equity/Bond/Alternative portfolio over the 34-month time period ending in December 2008 -

- The portfolio's annualized return was improved by 3.5 percentage points (increased from -5.6% to -2.1%), and
- The standard deviation was cut by one-third (drops from 17.9% to 11.3%).

Figure 6: Efficient Frontier with ATM VIX Calls Mar. 2006 to Dec. 2008

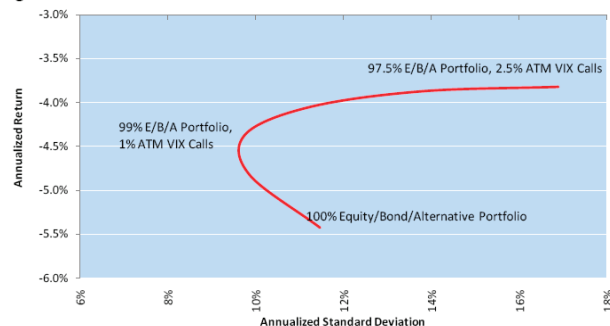


Figure 6: Efficient frontier shows that with a 1% allocation of ATM VIX calls to the Equity/Bond/Alternative portfolio over the 34-month time period ending in December 2008 -

- The portfolio's annualized monthly return was increased by 1.0 percentage points (from -5.4% to -4.4%), and
- The portfolio's standard deviation was reduced by one twelfth from 11.5% to 9.8%.

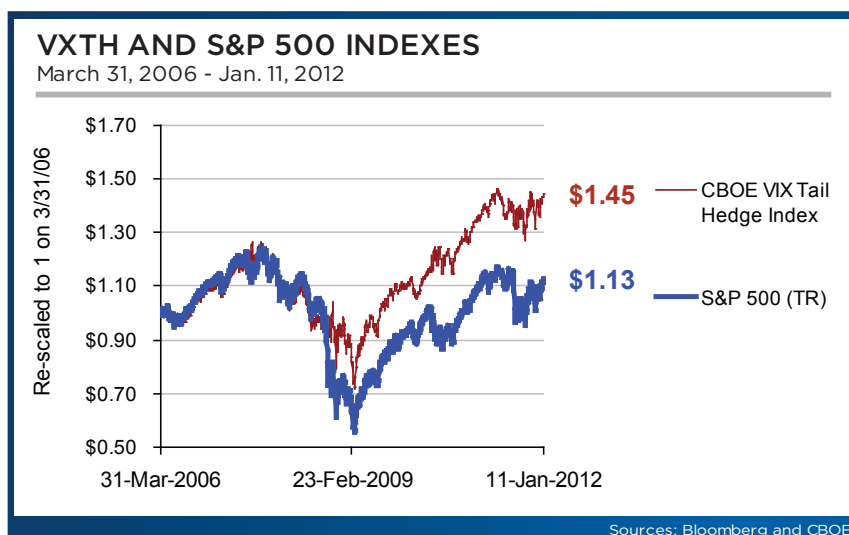
www.cboe.com/VIX

CBOE VIX TAIL HEDGE INDEX (VXTH)

The CBOE VIX Tail Hedge IndexSM (VXTHSM) tracks the performance of a hypothetical portfolio that -

- Buys and holds a portfolio of stocks designed to replicate the performance of the S&P 500[®] (total return) index (the total return index, with dividends reinvested), and
- Buys one-month 30-delta VIX call options. New VIX calls are purchased monthly, a procedure known as the “roll.” The weight of the VIX calls in the portfolio varies at each roll depending on the perceived likelihood that a “black swan” event could occur in the near future.

Here is a comparison of performance of the VXTH and S&P 500 indexes --



www.cboe.com/VXTH

VOLATILITY INDEXES® at CBOE

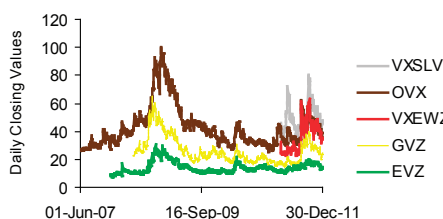
CBOE calculates 19 indexes that measure 30-day expected volatility --

19 INDEXES THAT MEASURE 30-DAY IMPLIED VOLATILITY

Index	Ticker	Webpage	2011 Year-end Value
<i>Indexes that reflect expected volatility for options on select stock indexes</i>			
CBOE Volatility Index	VIX	www.cboe.com/VIX	23.4
CBOE Russell 2000 Volatility Index	RVX	www.cboe.com/RVX	31.64
CBOE DJIA Volatility Index	VXD	www.cboe.com/VXD	21.42
CBOE Nasdaq Volatility Index	VXN	www.cboe.com/VXN	23.13
CBOE S&P 100 Volatility Index	VXO	www.cboe.com/VXO	22.98
<i>Indexes that reflect expected volatility for options on select ETFs</i>			
CBOE EuroCurrency Volatility Index	EVZ	www.cboe.com/EVZ	14.67
CBOE Gold Volatility Index	GVZ	www.cboe.com/GVZ	23.24
CBOE Crude Oil Volatility Index	OVX	www.cboe.com/OVX	38.74
CBOE Emerging Markets ETF Volatility Index	VXEEM	www.cboe.com/VXEEM	32.74
CBOE Brazil ETF Volatility Index	VXEWZ	www.cboe.com/VXEWZ	34.88
CBOE China ETF Volatility Index	VXFXI	www.cboe.com/VXFXI	33.23
CBOE Gold Miners ETF Volatility Index	VXGDX	www.cboe.com/VXGDX	38.02
CBOE Silver ETF Volatility Index	VXSLV	www.cboe.com/VXSLV	45.16
CBOE Energy Sector ETF Volatility Index	VXXLE	www.cboe.com/VXXLE	29.56
<i>Indexes that reflect expected volatility for options on select stocks</i>			
CBOE Equity VIX® on Apple	VXAPL	www.cboe.com/VXAPL	32.69
CBOE Equity VIX® on Amazon	VXAZN	www.cboe.com/VXAZN	45.12
CBOE Equity VIX® on Google	VXGOG	www.cboe.com/VXGOG	32.71
CBOE Equity VIX® on Goldman Sachs	VXGS	www.cboe.com/VXGS	44.13
CBOE Equity VIX® on IBM	VXIBM	www.cboe.com/VXIBM	25.33

VOLATILITY INDEXES

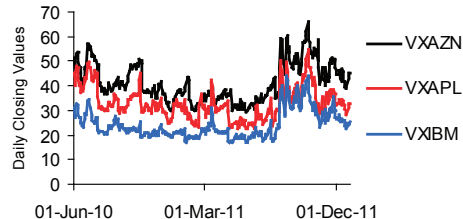
Expected Volatility of ETF Options



June 1, 2007 - Dec. 30, 2011

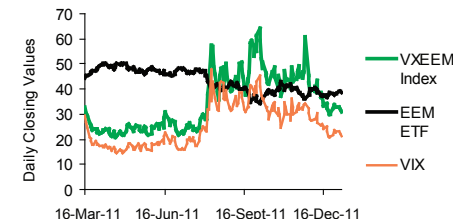
VOLATILITY INDEXES

Expected Volatility of Stock Options



June 1, 2010 - Dec. 30, 2011

VXEEM, VIX, and EEM ETF



Mar. 16, 2011 - Jan. 5, 2012

Correlations of Daily Returns (March 17, 2011 - Dec. 31, 2011)

	VIX Index	OVX Index	VXEEM Index	VXEWZ Index	SPX Index	USO ETF	EEM ETF	EWZ ETF
VIX Index	1.00							
OVX Index	0.71	1.00						
VXEEM Index	0.86	0.69	1.00					
VXEWZ Index	0.89	0.72	0.90	1.00				
SPX Index	-0.87	-0.66	-0.81	-0.84	1.00			
USO ETF	-0.60	-0.73	-0.61	-0.63	0.66	1.00		
EEM ETF	-0.80	-0.62	-0.81	-0.83	0.93	0.67	1.00	
EWZ ETF	-0.77	-0.64	-0.78	-0.85	0.87	0.67	0.94	1.00

Sources: Bloomberg and CBOE

www.cboe.com/Volatility

Options involve risk and are not suitable for all investors. Prior to buying or selling an option, a person must receive a copy of Characteristics and Risks of Standardized Options (the "ODD"). Copies of the ODD are available from your broker, by calling 1-888-OPTIONS, or from The Options Clearing Corporation, One North Wacker Drive, Suite 500, Chicago, Illinois 60606. Futures and options on CBOE's volatility indexes have several unique features that distinguish them from most equity and index options, and investors are strongly encouraged to closely read and understand the ODD and the VIX options FAQ at <http://www.cboe.com/micro/vix/vixoptionfaq.aspx> and other informational material before investing. Supporting documentation for claims, comparisons, statistics or other technical data is available by calling 1-888-OPTIONS, sending an e-mail to institutional@cboe.com, or by visiting www.cboe.com. The information in this document is provided solely for general education and information purposes. This document contains comparisons, assertions, and conclusions regarding the performance of indexes based on backtesting, i.e., calculations of how the indexes might have performed in the past if they had existed. Backtested performance information is purely hypothetical and is provided in this document solely for informational purposes. Backtested performance does not represent actual performance, and should not be interpreted as an indication of actual performance. Past performance does not guarantee future results. No statement within this document should be construed as a recommendation to buy or sell a security or a futures contract or to provide investment advice.

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