

# S&P 500 VIX Futures Index

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# S&P 500 VIX Futures Index Series

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- **Trading volatility**

- Spot VIX is difficult to replicate directly, and can be traded only in options and futures markets. S&P is launching an index series that will link to products that allow trading volatility in stock markets for the first time.

- **Not spot VIX, but similar properties**

- The S&P 500 VIX Short Term Futures Index has 87% correlation to VIX and an inverse relationship with the stock markets akin to spot VIX.

- **Tradable, long and short**

- The index can be replicated using VIX futures, but also through 30 day volatility swaps. A long position in the index is expected to decline over time due to term structure decay, while a short position in the index would have a long term positive return akin to returns of forward starting volatility arbitrage strategy.

# Construction

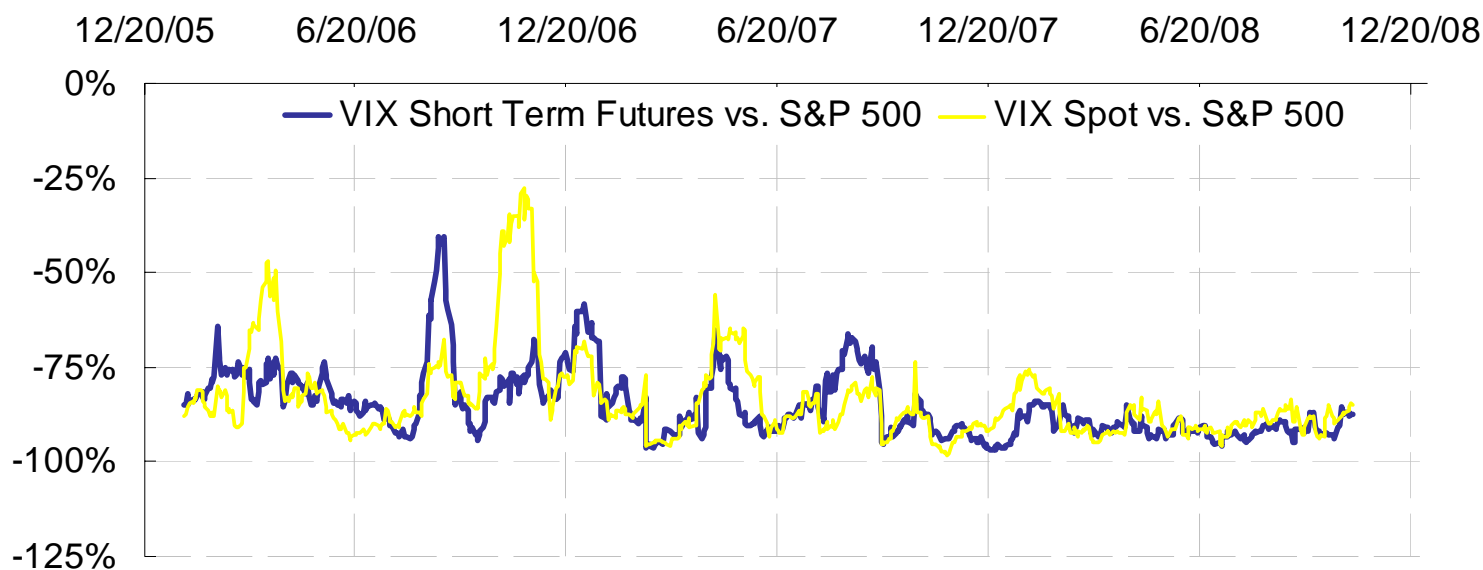
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- **The S&P 500 Short Term Future Index seeks to model the outcome of holding a long position in VIX futures contracts.**
  - The index is comprised of positions in first and second month (near and next term) futures contracts.
  - The index is rolled between the two contracts continuously throughout each monthly period between futures expiration dates.
  - Thus the index will be equivalent to a volatility swap with a constant maturity of 30 days.

# Diversification Properties

	S&P 500	VIX Index	VIX Short-Term Futures Index
S&P 500	100.0%	-75.6%	-76.3%
VIX Spot		100.0%	86.6%
VIX Short-Term Futures Index			100.0%

Correlation with S&P 500



Source: Standard & Poor's, CBOE, Bloomberg. S&P 500 refers to the price return series of S&P 500. VIX Short Term Futures refers to the excess return series of S&P 500 VIX Short Term Futures Index. From 12/20/2005 to 10/31/2008.

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# Portfolio Hedge Properties

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- Like spot VIX, the index rises when S&P 500 goes down

S&P 500 Daily Return	Probability Of Going Up	
	VIX Spot	VIX Short Term Futures Index
< 0	81.4%	71.0%
<-0.5%	94.9%	91.0%
< -1%	98.1%	96.2%
<-1.5%	100.0%	98.4%

Source: Standard & Poor's, CBOE, Bloomberg. S&P 500 refers to the price return series of S&P 500. VIX Short Term Futures refers to the excess return series of S&P 500 VIX Short Term Futures Index. From 12/20/2005 to 10/31/2008.

# Portfolio Insurance Properties

- Both VIX spot and the index go up when S&P 500 takes a dive

## Worst 20 Daily Drops of S&P 500

Date	S&P 500	VIX Spot	VIX Short Term Futures Index
10/15/2008	-9.03%	25.61%	14.03%
9/29/2008	-8.79%	34.48%	14.00%
10/9/2008	-7.62%	11.11%	9.97%
10/22/2008	-6.10%	31.14%	10.34%
10/7/2008	-5.74%	3.13%	9.60%
9/15/2008	-4.71%	23.54%	6.00%
9/17/2008	-4.71%	19.54%	5.72%
10/2/2008	-4.03%	13.69%	6.67%
10/6/2008	-3.85%	15.31%	3.60%
9/22/2008	-3.82%	5.55%	6.99%
2/27/2007	-3.47%	64.22%	24.53%
10/24/2008	-3.45%	16.71%	11.34%
9/9/2008	-3.41%	12.50%	7.00%
2/5/2008	-3.20%	8.66%	5.65%
10/27/2008	-3.18%	1.18%	5.83%
6/6/2008	-3.09%	26.46%	11.04%
10/21/2008	-3.08%	0.26%	-2.60%
9/4/2008	-2.99%	12.13%	7.37%
8/9/2007	-2.96%	23.45%	14.07%
11/7/2007	-2.94%	23.84%	10.97%

Source: Standard & Poor's, CBOE, Bloomberg. S&P 500 refers to the price return series of S&P 500. VIX Short Term Futures refers to the excess return series of S&P 500 VIX Short Term Futures Index. From 12/20/2005 to 10/31/2008.

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# Implementation

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## *Futures Based Implementation*

- Average trading volume: ~2432 contracts
- Average trading notional: ~\$84 mn
- Assumed ETF size: ~\$250 mn
- Trading per day:  $(1/20) \times 250 =$   
\$12.5 mn
- % of average trading demanded by  
ETF: ~15%

(Based on volumes from 8/1 to 10/31)

## *Swap Based Implementation*

- At end of every day, a long position in index represents a long 30-day volatility swap.
- Volatility swaps can be hedged using SPX options.
- SPX options are extremely liquid, trading more than half a million contracts a day.
- Swaps may also be hedged via VIX options, which trade more than 100K contracts a day.

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