



## strategy description

Volatility is the standard deviation (a concept first introduced by Sir Francis Galton) of returns and is the traditional measure of financial risk. The best known volatility index is VIX, which measures the expected volatility of S&P500 returns. The large negative correlation (another concept invented by Galton) between VIX (tradable by the VXX ETN) and the returns themselves (tradable by the SPY ETF) can be exploited to construct a neutral (zero beta), hedged portfolio with very low volatility itself. It turns out that, in particular market conditions this portfolio embodies sizeable arbitrage opportunities. The Galton strategy exploits these to provide consistent positive returns.

## statistics (2004–2017)

- Average net return** : 13.94% (S&P500: 8.02%)
- Average volatility** : 6.20% (S&P500: 16.19%)
- Average Sharpe Ratio** : 2.04 (S&P500: 0.85%)
- Maximum draw-down** : 6.36% (S&P500: 56.78%)
- Monthly upside capture** : 38.75%
- Monthly downside capture** : -35.52%
- Live trading** : since **Mai 2016**

### Remarks:

- a) the VXX ETN exists only since the beginning of 2009; to obtain the statistics the ETN was simulated from its definition before 2009, starting 2009 real data were used;
- b) the results do not include transaction costs which would reduce the yearly average return by approximately 0.01%.

## Key facts

- Currency** : USD
- Instruments** : SPY ETF (S&P 500) and VXX ETN (VIX)
- Liquidity** : daily
- Risk factors** : long positions, short positions, no derivatives
- Trading** : algorithmic, with human surveillance

## performance details

Year	Performance		Volatility		Max. draw-down	Sharpe ratio
	Strategy	S&P500	Strategy	S&P500		
2004*	19.72%	11.79%	4.59%	10.44%	2.19%	6.64
2005	23.90%	3.00%	5.84%	10.28%	3.28%	3.58
2006	9.81%	13.62%	4.15%	10.04%	2.42%	1.28
2007	0.32%	3.53%	3.89%	15.99%	5.75%	-0.95
2008	57.84%	-38.49%	12.30%	40.97%	4.59%	4.54
2009	10.89%	23.45%	5.99%	27.29%	4.15%	1.78
2010	19.18%	12.78%	6.18%	18.05%	5.47%	3.09
2011	12.66%	0.00%	6.17%	23.27%	4.48%	2.03
2012	6.99%	13.32%	8.66%	12.88%	6.36%	0.79
2013	9.11%	29.73%	6.67%	10.97%	5.31%	1.35
2014	2.94%	11.41%	6.01%	10.91%	5.01%	0.47
2015	12.88%	-0.76%	5.61%	17.05%	4.01%	2.28
2016	6.84%	9.53%	5.39%	11.85%	4.02%	1.33
2017	2.13%	19.41%	5.38%	6.68%	6.32%	0.41

\*starting 17.05.2004

