



strategy description

The Bernoulli strategy is a probability arbitrage strategy on the sign of returns of the SPY ETF (based on the S&P500 index). While it is well established that the absolute value of returns is not normally distributed, it is a widely held opinion that the signs of returns have the same probability distribution as fair coin tosses, a fact which is confirmed by a superficial analysis. We have, however identified subtle and systematic deviations from this behaviour. The strategy implements a complex algorithm to exploit these deviations for consistent profits with low volatility.

Key facts

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

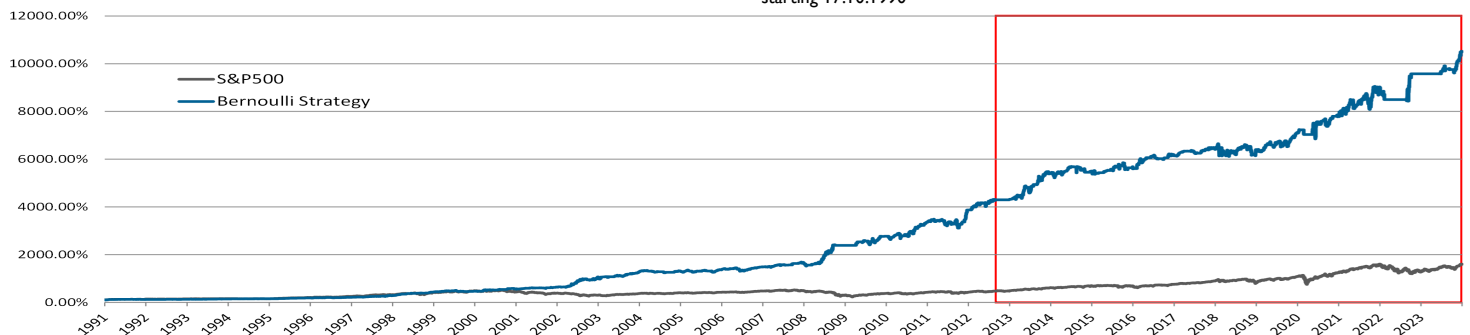
statistics (1990–2023)

- Average net return** : 15.46% (S&P500: 9.95%)
- Average volatility** : 10.54% (S&P500: 16.54%)
- Average Sharpe Ratio** : 1.10 (S&P500: 0.70)
- Maximum draw-down** : 10.77% (S&P500: 56.78%)
- Monthly upside capture** : 52.21%
- Monthly downside capture** : -9.83%
- Real trading** : since August 2012

performance details

Year	Performance		Volatility		Max. draw-down	Sharpe ratio
	Strategy	S&P500	Strategy	S&P500		
1990*	3.90%	10.53%	14.59%	15.21%	4.09%	-0.25
1991	19.38%	26.31%	11.29%	14.27%	5.81%	1.23
1992	4.83%	4.46%	8.03%	9.66%	8.74%	0.17
1993	7.40%	7.06%	7.69%	8.58%	4.24%	0.57
1994	8.37%	-1.54%	5.72%	9.82%	3.69%	0.68
1995	20.92%	34.11%	6.35%	7.80%	3.07%	2.43
1996	14.73%	20.26%	10.88%	11.76%	7.44%	0.89
1997	36.44%	31.01%	16.88%	18.15%	8.40%	1.86
1998	51.59%	26.67%	11.90%	20.25%	3.30%	3.91
1999	7.05%	19.53%	11.70%	18.04%	10.66%	0.22
2000	20.95%	-10.14%	14.36%	22.18%	9.46%	1.04
2001	14.89%	-13.04%	11.48%	21.51%	6.08%	0.95
2002	65.24%	-23.37%	24.21%	25.98%	7.07%	2.63
2003	20.41%	26.38%	14.50%	17.03%	8.69%	1.34
2004	2.29%	8.99%	7.25%	11.07%	7.39%	0.18
2005	3.65%	3.00%	8.57%	10.26%	7.38%	0.08
2006	8.80%	13.62%	9.40%	10.02%	9.90%	0.46
2007	11.63%	3.53%	7.55%	15.95%	3.33%	1.01
2008	44.12%	-38.49%	19.95%	40.89%	10.22%	2.11
2009	16.13%	23.45%	9.88%	27.23%	7.26%	1.59
2010	20.98%	12.78%	13.49%	18.02%	8.19%	1.53
2011	15.56%	0.00%	12.36%	23.22%	10.77%	1.24
2012	11.64%	13.32%	7.35%	12.86%	4.08%	1.56
2013	25.54%	29.73%	9.78%	10.94%	6.21%	2.60
2014	1.34%	11.41%	8.91%	11.17%	4.89%	0.14
2015	1.67%	-0.76%	8.84%	17.02%	5.87%	0.15
2016	9.84%	9.53%	5.56%	12.58%	4.40%	1.66
2017	4.34%	19.41%	3.18%	6.67%	2.17%	0.99
2018	-0.09%	-6.24%	12.30%	17.03%	8.12%	-0.20
2019	10.56%	28.88%	8.00%	12.53%	5.26%	1.06
2020	11.23%	16.26%	10.13%	34.36%	8.92%	1.07
2021	14.29%	26.89%	11.76%	13.07%	7.69%	1.21
2022	6.39%	-19.44%	10.04%	24.13%	6.90%	0.36
2023	9.59%	24.23%	4.52%	13.06%	3.03%	1.00

*starting 17.10.1990



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