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Northington Trading, LLC
Charlotte, NC
USA



METASWING SYSTEM PERFORMANCE

A statistical performance study of MetaSwing trading systems

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About Northington Trading

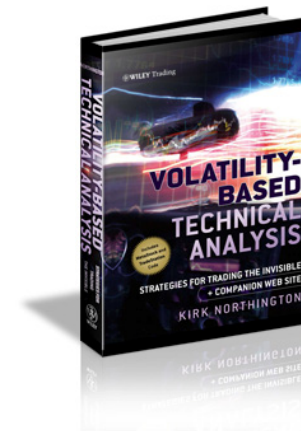
Northington Trading, LLC is an algorithmic trading system design and market research firm. Our expertise lies with trading tools and algorithms created within a Volatility-Based Technical Analysis framework. We make software for hedge funds, proprietary trading firms, and asset management firms. Our solutions achieve the advantages of profitability, probability, and risk management through the use of quantitative design and statistically valid research methodology. We strive to make tools and methods which are objective, quantitative and predictive that can be applied systematically or compliment a discretionary approach.

We are the creators of several **new concepts** in chart technical analysis. **Our products apply these concepts within charting platforms.**

In his book *Volatility-Based Technical Analysis: Strategies for Trading the Invisible* (John Wiley & Sons; Wiley Trading Series), Kirk Northington lays the groundwork for two new volatility-based charting concepts.

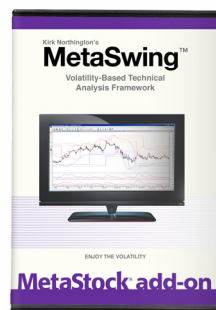
Volatility-Based Support and Resistance identifies high accuracy points of support and resistance which are remarkably simple to use.

Volatility Shift identifies a condition of hidden momentum which forecasts a higher trading range in the days to come.



Currently our software is available as MetaSwing, a subscription based Add-On to MetaStock and TradeStation.

Bloomberg



TradeStation®
Add-On 
Open Platform Developer

Back-Testing Methodology

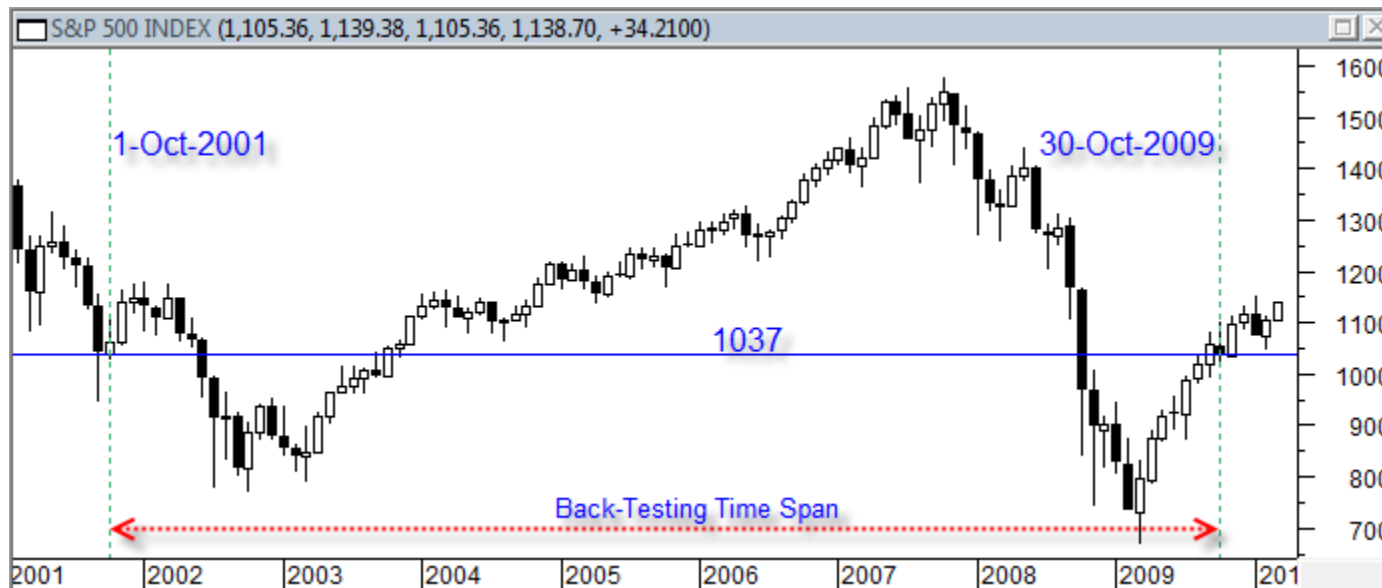
Test Population For back-testing each of the MetaSwing components the individual stocks of the S&P 500 Index are used. The specific makeup is that of the S&P 500 as defined on September 30, 2009.

Data Source All back-testing is performed using daily time series data from Thomson Reuters. The test signals are only those that occur between October 1, 2001 and October 30, 2009; approximately eight years.

Market Time Span The test data was chosen to be market neutral. There is only 2.3 points difference in the S&P 500 Index from the beginning of the test data time span to the end. This creates a more unbiased, de-trended market environment. Doing so creates test results attained throughout an equal effect of bull and bear markets.

Beginning Date: S&P 500 Index 10/1/2001 Close = 1038.55

Ending Date: S&P 500 Index 10/30/2009 Close = 1036.19



Back-Testing Methodology

Performance Test The testing process simulates a trade for each specific signal derived from the component being tested. It is not our recommendation to trade based on a particular component's signal. Simulating a trade is used as a way of testing the component. The signal generation is different for each component. The signal generation logic is given literally and visually with each set of performance data.

Survivorship Bias Filtering

This phase compensates for testing an Index of stock constituents that does not remain static. There are two means by which survivor bias enters the research universe:

Type 1 Bias: The bias of excluding companies from a research universe that met membership criteria historically but did not on the day the universe was defined. These are poor performers eliminated by delisting or acquisition, prior to current index inclusion.

Type 2 Bias: The bias of including companies in a research universe that did not meet membership criteria until recently. These are outperformers tested for time spans occurring prior to index qualification.

The purpose of ensuring that performance testing is free of survivorship bias, is to directly simulate the trading of index constituents just as one would have done so over time; just as the makeup of the index changed. This significantly improves the probability that future system performance will track historical system performance.

Monte Carlo Simulation In addition the three arithmetic mean performance metrics described above a Monte Carlo Simulation is also provided. The Monte Carlo Simulation uses a 10,000 iteration, random sampling with replacement. Bootstrapping results are given for ten successively, compounded trades, with an accompanying distribution histogram.

Broad Market Comparison For each instance of a test signal a concurrent trade using the S&P 500 Index is also measured. The performance of the index is then compared to the test statistic.

Back-Testing Methodology

Performance Metrics The component performance data is expressed in three different metrics expressed as an arithmetic mean:

Profit Potential: For a long trade this is the percentage gain/loss from the signal (trade entry point on day zero) to the High price of the trade exit day.

Loss Potential: For a long trade this is the percentage loss/gain from the signal (trade entry point on day zero) to the Low price of the trade exit day.

Net Profit: For a long trade this is the percentage gain/loss from the signal (trade entry point on day zero) to the Close price of the trade exit day.

Further Consideration The signal generation and trade simulation is mechanically generated by the criteria expressed for each component's test. As such there are many trades measured that would not normally be utilized due to obvious trader discretion. An example would be a long signal entry at a time when an underlying corporate news is very negative. Therefore the back-testing results herein should be **considered conservative, or even worst case**. On request, Northington Trading will furnish the raw data files used during for the testing process.

Best Practice Compliance Throughout the back-testing process every effort has been made to adhere to the best practices promoted by the Market Technician's Association. In general these practices are:

- Law of large numbers
- Distribution analysis
- Survivorship Bias Filtering
- De-trended market span
- Monte Carlo Simulation
- Algorithmically generated test results
- Direct comparison to broad market performance

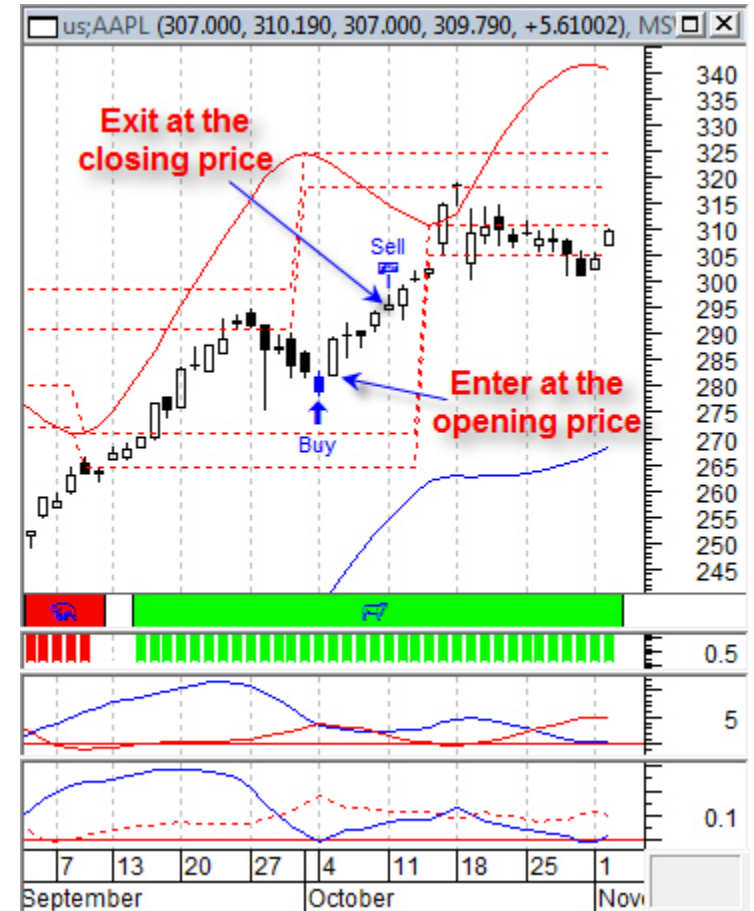
MSW4 Adeo Long System

Trading Rules and Best Practices

The MSW4 Adeo Long trading system is based on end-of-day trade management.

1. Entry signals are generated automatically on any MSW4 chart. The same trade signals can be generated by running the MSW4 System exploration in MetaStock. Also the MetaSwing Daily Report, which is posted at metaswing.com, lists daily system trade signals found in the NASDAQ, NYSE and ASE exchanges.
2. Enter at the open of the next trading session. A Market On Open order (MOO) can often be used effectively. If desired a protective stop can be placed at two units of ATR(40) below the open. A sell target, to be executed prior to the system exit, can be set at three units of ATR(40) above the open.
3. Exit on the fifth day of the trade. A Market On Close (MOC) can usually be used effectively. The signal day is day zero, and the entry day is day one. An exit signal is shown on MSW4 charts.
4. The trade may be extended past the normal five day duration. This is indicated by a fresh Adeo Buy signal on the MSW4 chart. In this case the exit will be extended to the fifth trading session after the new Adeo Buy signal.

The statistical system performance reported herein is based on the trade management rules listed above. Potential slippage or commissions are not factored into the results shown.



The complete trade data used in this back testing analysis is available in an Excel file format. It can be accessed at

http://www.metaswing.com/site/files/NTR_SV_MSW4_Adeo_Long.xlsx

MSW4 Adeo Long System

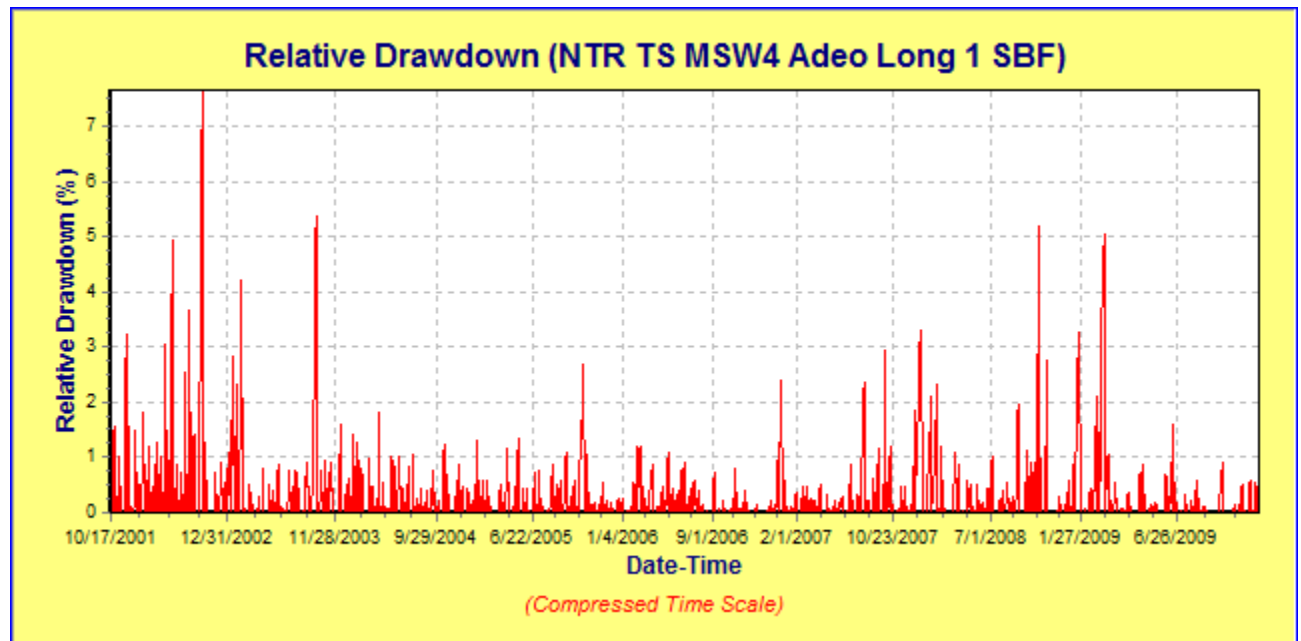
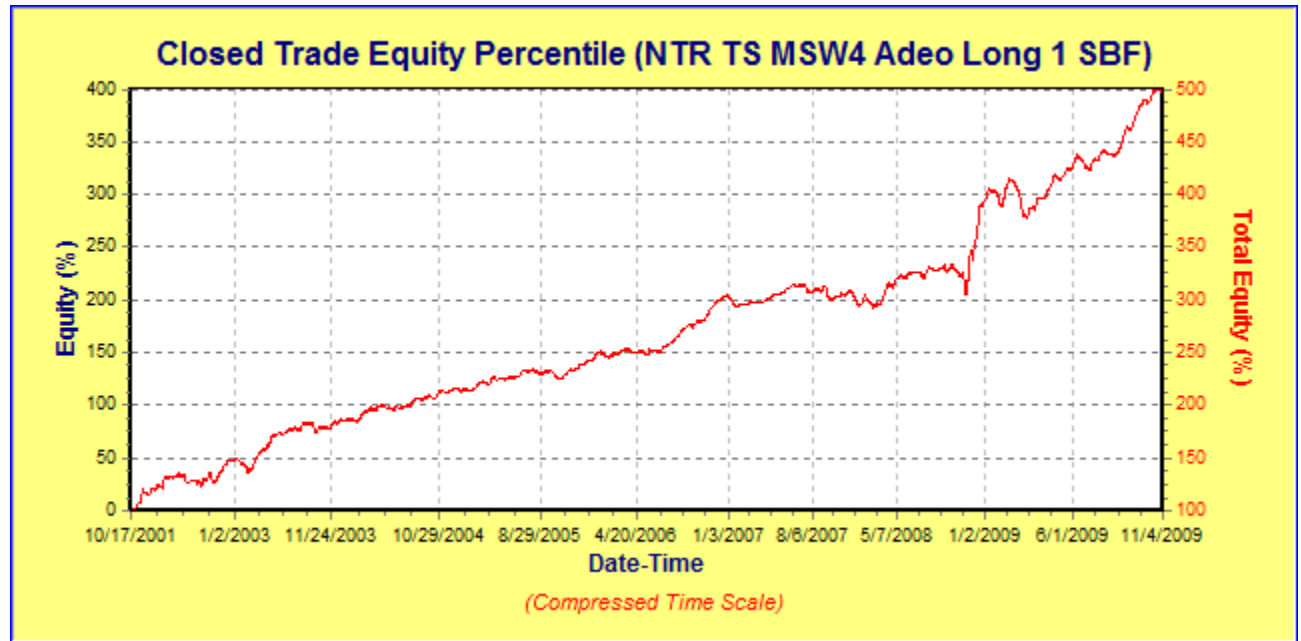
Portfolio Trade Simulation

Trade Parameters:

Initial Capital	\$	100,000
Max Capital Per Trade	\$	10,000
Margin Use		None
Survivorship-Bias Filtered		Yes
System Direction		Long Only
Trades Processed		3,286
Trades Executed		1,995
Test Time Span:		Oct 1, 2001 to Oct 30, 2009

Performance Results:

Finishing Capital	\$	498,673
Sharpe Ratio		1.67
CAGR		22.03%
Profit Factor		1.66
Buy and Hold Return (S&P 500)		0.00%
[S&P500 Index delcined by 2.3 points during this test]		
Win %		57.99%
Loss %		41.55%
Average Trade Duration (days)		6
Max Consecutive Winning		20
Max Consecutive Losing		11
Average Winning Trade \$	\$	846.46
Average Losing Trade \$	\$	(699.06)



MSW4 Adeo Long System

Monte Carlo Simulation

Daily Time Frame Signal

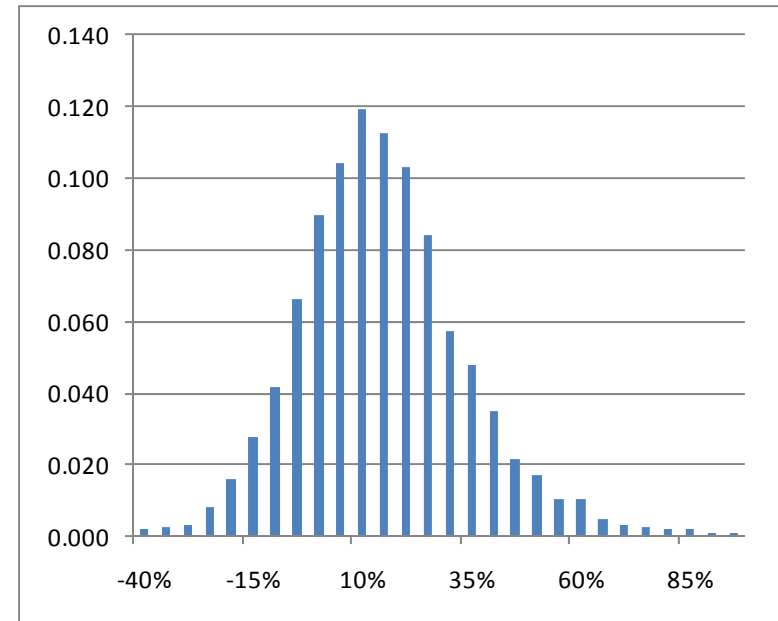
10 Successive Trade Summation

(in sample)

Test Time Span: Oct 1, 2001 to Oct 30, 2009

Probability of gain	74.0%
Probability of loss	26.0%
Compound Mean return	12.4%
Simple Mean return	11.8%
Distribution Analysis:	
Median return	10.9%
80th percentile return	27%
20th percentile return	-3%
Skewness	0.665
Kurtosis	4.546

These performance numbers are based on **10 successive trades**. Your annual performance will be larger or smaller based on the quantity of trades you make annually.



Annual Monte Carlo Simulation results for 10 successive trades:

(annual sample)

	Year	2009	2008	2007	2006	2005	2004	2003	2002	2001
Probability of gain		78.2%	69.8%	71.9%	72.5%	65.6%	66.4%	79.2%	73.2%	90.9%
Probability of loss		21.9%	30.2%	28.1%	27.5%	34.4%	33.6%	20.8%	26.8%	9.1%
Compounded Mean return		18.7%	17.7%	6.5%	8.3%	4.5%	5.3%	13.7%	15.7%	30.7%
Simple Mean return		17.3%	16.5%	6.4%	8.0%	4.4%	5.2%	12.9%	14.7%	27.2%
Distribution Analysis:										
Median return		17%	13.2%	6.5%	7.5%	3.9%	4.8%	12.7%	12.4%	28.4%
80th percentile return		37%	40%	17%	19%	13%	15%	27%	33%	50%
20th percentile return		-1%	-8%	-3%	-3%	-4%	-5%	0%	-4%	10%
Skewness		0.502	1.059	-0.257	0.500	0.359	0.150	0.405	1.035	0.654
Kurtosis		3.848	5.511	4.024	3.783	3.548	3.054	3.319	5.473	3.793
Trades Executed		536	347	315	314	348	410	427	449	140

MSW4 Adeo Long System

Mean Performance By Day

and

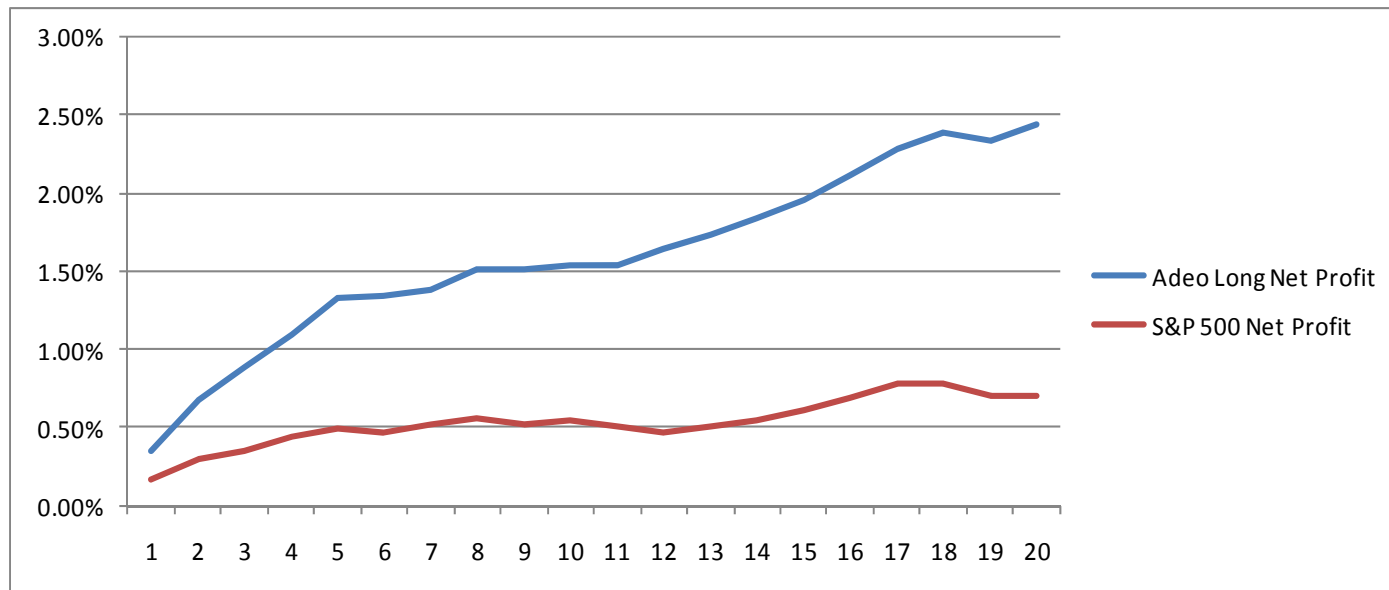
Broad Market Outperformance Comparison

Daily Time Frame Signal

Oct-2001 to Nov-2009

Signal to Close

Sample Size = Population 3514	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20
Adeo Long Profit Potential	1.85%	2.19%	2.45%	2.65%	2.84%	2.99%	3.03%	3.11%	3.21%	3.19%	3.22%	3.30%	3.35%	3.44%	3.59%	3.64%	3.86%	4.00%	4.01%	4.07%
Adeo Long Loss Potential	-1.58%	-1.19%	-0.86%	-0.70%	-0.51%	-0.36%	-0.33%	-0.27%	-0.23%	-0.18%	-0.17%	-0.09%	0.05%	0.10%	0.23%	0.35%	0.47%	0.63%	0.62%	0.65%
S&P 500 Profit Potential	0.81%	0.96%	1.05%	1.12%	1.18%	1.21%	1.22%	1.27%	1.27%	1.28%	1.26%	1.22%	1.21%	1.24%	1.31%	1.35%	1.46%	1.49%	1.45%	1.43%
S&P 500 Loss Potential	-0.70%	-0.56%	-0.44%	-0.38%	-0.31%	-0.29%	-0.28%	-0.26%	-0.26%	-0.28%	-0.26%	-0.28%	-0.29%	-0.24%	-0.18%	-0.12%	-0.04%	0.02%	-0.05%	-0.08%
	2.1	2.3	2.5	2.4	2.7	2.9	2.7	2.7	2.9	2.8	3.1	3.5	3.5	3.4	3.2	3.0	2.9	3.1	3.3	3.5
Adeo Long Net Profit	0.34%	0.67%	0.88%	1.09%	1.32%	1.34%	1.38%	1.52%	1.50%	1.53%	1.54%	1.64%	1.73%	1.84%	1.95%	2.11%	2.28%	2.38%	2.33%	2.44%
S&P 500 Net Profit	0.16%	0.30%	0.35%	0.45%	0.51%	0.46%	0.52%	0.56%	0.52%	0.54%	0.50%	0.46%	0.50%	0.54%	0.61%	0.69%	0.78%	0.78%	0.70%	0.70%

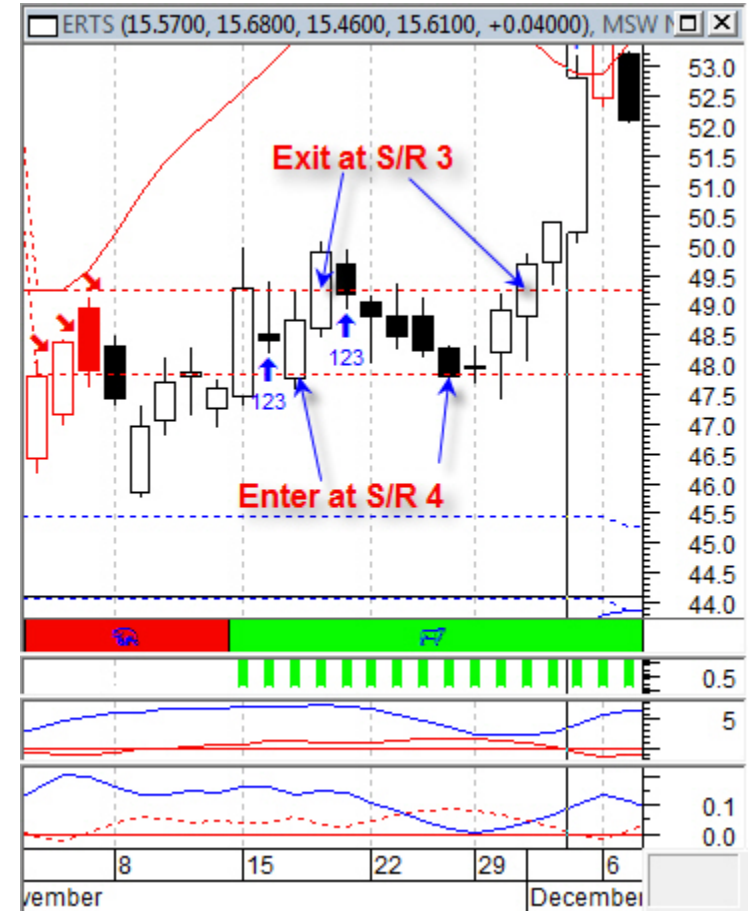


MSW4 1-2-3 Long System

Trading Rules and Best Practices

The MSW4 1-2-3 Long trading system is based on end-of-day trade management.

1. Entry signals are generated automatically on the MSW4 Daily chart. The same trade signals can be generated by running the MSW4 System exploration in MetaStock. Also the MetaSwing Daily Report, which is posted at metaswing.com, lists daily system trade signals found in the NASDAQ, NYSE and ASE exchanges.
2. If the close on the signal day is between S/R 3 and S/R 4, place a limit order to buy at the S/R 4 line. This is signal day one. If the order has not executed by signal day five then cancel it; the trade is no longer valid. If the order executes prior to the 5 day expiration then the trade is in play.
3. When the entry order executed it is deemed to be trade day one. As soon as the order executes place a limit order to sell at the existing S/R 4 line. The S/R 4 line is the profit target.
4. Sometimes price will gap at the open above the S/R 4 line. A limit order will enable the order to fill at or near the open, which achieves a higher profit than had the trade sold at the S/R 4 line.
5. If the existing position does not reach its profit target by trade day five, then exit at the close of trade day five. A market on close (MOC) order is recommended.
6. The exact same trade management rules apply for the S/R 1 and S/R 2 lines.



The complete trade data used in this back testing analysis is available in an Excel file format. It can be accessed at

<http://www.metaswing.com/site/files/MSW4%201-2-3%20Long%20System%20-%20Backtest%20Data.xlsx>

MSW4 1-2-3 Long System

Monte Carlo Simulation

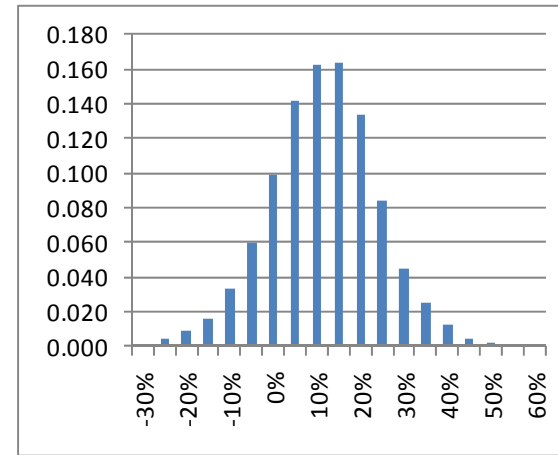
Daily Time Frame Signal

10 Successive Trade Summation

Year Oct-2001 to Nov-2009

These performance numbers are based on **10 successive trades**. Your annual performance will be larger or smaller based on the quantity of trades you make annually.

Average Length Trade	3.36 days
Probability of gain	76.9%
Probability of loss	23.1%
Compounded Mean return	9.0%
Simple Mean return	8.7%
Distribution Analysis:	
Median return	9.0%
80th percentile return	19%
20th percentile return	-1%
Skewness	0.062
Kurtosis	3.639
Trades Executed	1,398



Note: Average individual win/loss ratio is 67% win/ 33% loss.

Annual Monte Carlo Simulation results (for 10 successive trades):

Year	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
Probability of gain	80.8%	80.4%	67.2%	67.3%	88.8%	78.6%	65.8%	76.9%	84.4%	81.2%	76.4%	61.3%	78.6%	88.2%	83.3%	82.9%	68.7%
Probability of loss	19.2%	19.6%	32.8%	32.7%	11.2%	21.4%	34.2%	23.1%	15.6%	18.8%	23.6%	38.7%	21.4%	11.8%	16.7%	17.1%	31.3%
Compounded Mean return	8.5%	15.9%	6.2%	4.0%	11.5%	6.3%	2.9%	8.1%	15.2%	13.6%	11.8%	4.4%	11.1%	11.5%	9.8%	7.5%	4.4%
Simple Mean return	8.2%	14.9%	6.0%	4.0%	10.9%	6.1%	2.9%	7.9%	14.4%	12.9%	11.3%	4.4%	10.6%	11.0%	9.5%	7.3%	4.3%
Distribution Analysis:																	
Median return	8.9%	14.5%	6.0%	4.1%	12.2%	6.5%	4.4%	8.4%	15.4%	13.2%	11.7%	4.6%	11.4%	11.7%	9.7%	8.4%	4.3%
80th percentile return	17%	31%	17%	12%	19%	13%	12%	18%	28%	26%	25%	17%	23%	20%	18%	15%	12%
20th percentile return	0%	0%	-5%	-4%	4%	0%	-5%	-1%	3%	1%	-2%	-9%	-1%	3%	1%	1%	-3%
Skewness	-0.301	0.549	0.058	-0.024	-0.583	-0.112	-0.846	-0.062	0.026	0.132	0.067	-0.015	-0.113	-0.073	0.124	-0.644	0.067
Kurtosis	2.943	3.907	2.811	2.918	3.741	2.887	4.095	3.034	3.182	2.890	2.824	3.012	2.894	2.980	3.260	3.919	2.902
Trades Executed	185	182	144	155	189	183	187	175	149	151	146	153	140	149	154	167	140

MSW4 1-2-3 Long System

Mean Performance By Day and

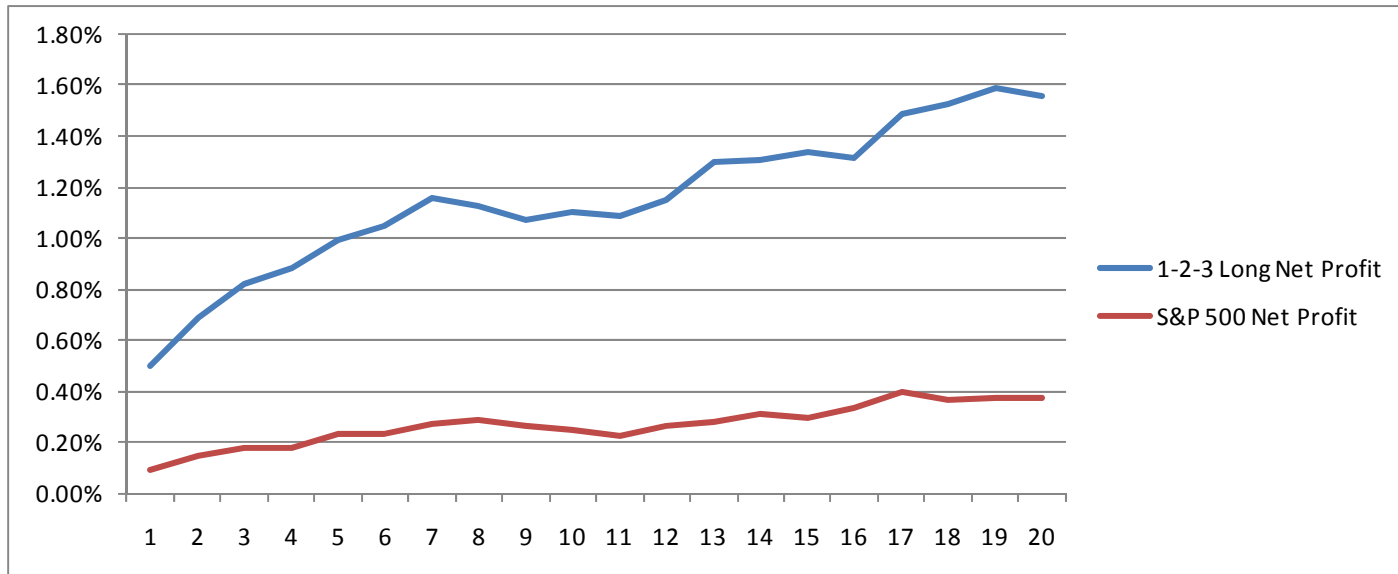
Broad Market Outperformance Comparison

Daily Time Frame Signal

Oct-2001 to Nov-2009

Signal to Close

Sample Size = Population 1398	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20
1-2-3 Long Profit Potential	1.9	2.4	3.5	4.1	5.4	7.4	8.7	11.3	7.6	6.5	7.2	9.4	16.6	31.1	38.9	32.5	152.4	25.1	18.2	29.6
1-2-3 Long Loss Potential	-0.97%	-0.79%	-0.60%	-0.52%	-0.42%	-0.32%	-0.28%	-0.21%	-0.32%	-0.37%	-0.34%	-0.27%	-0.15%	-0.08%	-0.07%	-0.08%	-0.02%	0.12%	0.16%	0.10%
S&P 500 Profit Potential	1.2	1.3	1.6	1.6	1.8	2.1	2.2	2.2	2.3	2.2	1.9	2.1	2.3	2.4	2.6	2.6	3.0	3.5	3.0	3.0
S&P 500 Loss Potential	-0.60%	-0.58%	-0.51%	-0.49%	-0.46%	-0.43%	-0.41%	-0.42%	-0.41%	-0.42%	-0.46%	-0.44%	-0.40%	-0.39%	-0.37%	-0.37%	-0.33%	-0.30%	-0.33%	-0.34%
1-2-3 Long Net Profit	5.5	4.7	4.7	4.9	4.2	4.5	4.2	3.9	4.1	4.5	4.8	4.4	4.7	4.2	4.5	3.9	3.7	4.2	4.3	4.2
S&P 500 Net Profit	0.09%	0.15%	0.17%	0.18%	0.23%	0.24%	0.27%	0.29%	0.26%	0.25%	0.23%	0.26%	0.28%	0.31%	0.30%	0.34%	0.40%	0.37%	0.37%	0.37%



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