

Volatility Band False Breakout System By Graham Voigt, BMJ Software

Here's a simple system that uses price action off of volatility bands in order to generate entries based on false breakouts. A lot of people like to incorporate different types of volatility bands into their trading so I thought it would be interesting to show the results of the same system applied with different types of bands. Two popular types of volatility bands are Bollinger Bands and Keltner Channels, so we'll test those. In NeuroShell, the Bollinger Bands are included in the Time Series category; the Keltner Channels are included in the Advanced Indicator Set 1. We'll also create and test variations of Bollinger Bands and Keltner Channels using indicators included in the BMJ Fractal Analysis Indicator Set. This will hopefully illustrate how our indicators can sometimes be used in order to improve already profitable systems.

I created bands similar to Bollinger Bands by adding and subtracting a multiple of the standard deviation to the BMJ FFilter 30 of the close.

I did a similar process in order to create bands that resemble Keltner Channels. In this case I added and subtracted a multiple of the BMJ FFilter ATR 30 to the BMJ FFilter 30 of the close.

For long and short entries, I want to find moments where the price briefly breaks outside the bands but still manages to close within them. These will represent a false breakout of the band so I'll enter in the direction away from the band. This type of entry rule is really easy to accomplish using the Boolean And2 indicator included in NeuroShell with two simple rules as inputs. For longs I want to look for bars where the low crosses below the lower band, but the bar still manages to close above it. Here's a simplified version of how it looks within the Indicator Wizard:

And2

Operand #1 = CrossBelow(Low, Lower Band)

Operand #2 = A>B (Close, Lower Band)

Shorts are the opposite, so I'm looking for bars where the high crosses above the upper band, but the close still manages to close below it. This time the simplified version of the rule looks like this:

And2

Operand #1: CrossAbove(High, Upper Band)

Operand #2: A<B (Close, Upper Band)

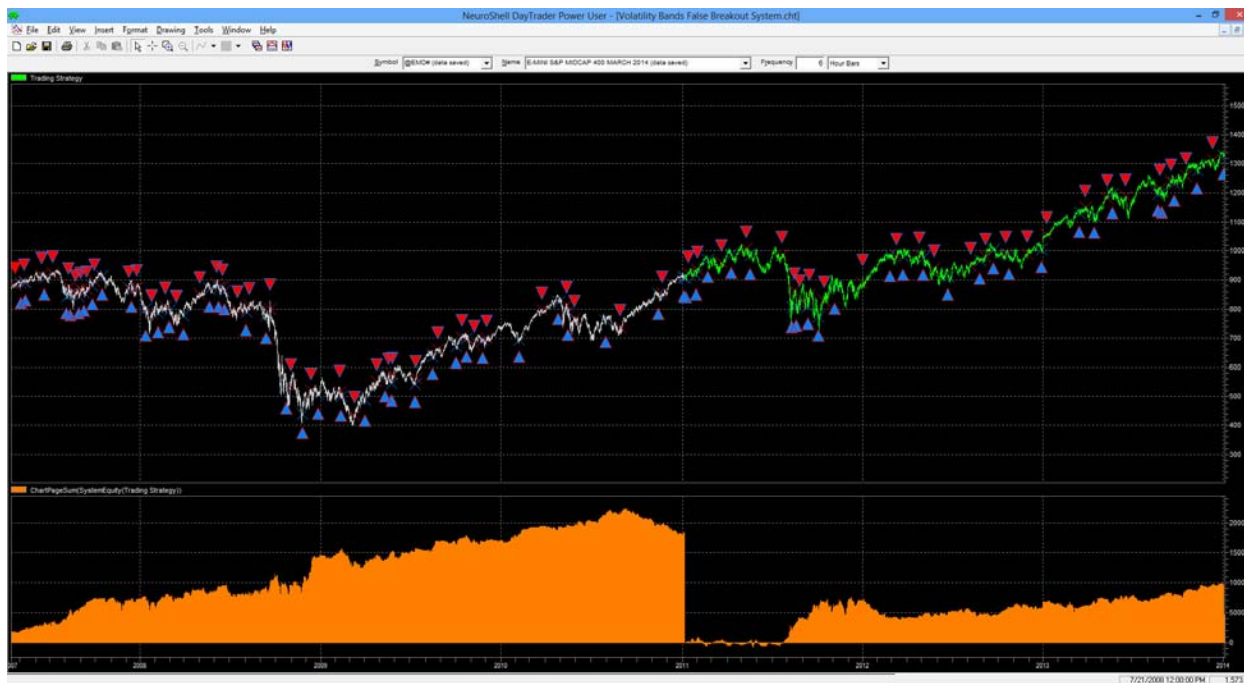
I chose to trade five of the more popular mini index futures contracts on a six hour timeframe using data provided by IQFeed. The contracts traded were the e-mini S&P 500 (ES), e-mini S&P Midcap 400 (EMD), e-mini Dow Jones (YM), e-mini Nasdaq 100 (NQ), and mini Russell 2000 (TFS). For parameter optimization, I fixed the standard deviation and ATR multiples at 2 and linked all the remaining parameters together with a range of 20-40. Match Chart Page was selected for the optimization period and three years were added for out-of-sample trading.

Maximize Return On Account * Log Equity Curve Correlation was selected for the optimization objective and position size was fixed at one contract. Margin was set to \$4,510 (typical margin for the ES), commissions of \$2.50 per contract per side were added and the point values for each contract were entered. I also generally like to include slippage but this becomes difficult when trading multiple futures contracts because they often have different tick increments. I overcame this by simply adding an extra two ticks of commissions per contract per side in addition to the \$2.50.

The results are very promising, with all four strategies making money out-of-sample on average. Below are the results for each strategy. Also included is a picture of the ChartPageSum of the equity curves.

Keltner Channel Results (Trading Strategy):

Trading Strategy Wizard - [Trading Strategy]											
Trading Strategy Results Summary											
Name	Symbol	Data Set	Return * Log Equity Correlation	Ret on Trades	1yr Ret on Account	Net Profit	#Trades	#Winning Trades	#Losing Trades	Max Drawdown	
E-MINI S&P MIDC...	@EM...	Optimizati...	294.4292	1424.2%	330.4%	\$ 64,549.96	74	49	25	\$ 23,710.00	
E-MINI S&P MIDC...	@EM...	Trading	146.3217	1032.4%	197.2%	\$ 46,794.99	51	32	19	\$ 21,465.00	
E-MINI S&P 500 ...	@ES...	Optimizati...	146.2993	1032.5%	151.3%	\$ 46,850.00	100	67	33	\$ 16,547.50	
E-MINI S&P 500 ...	@ES...	Trading	-11.42719	-260.5%	-16.9%	\$ -11,367.50	41	21	20	\$ 23,390.00	
E-MINI NASDAQ ...	@NQ...	Optimizati...	75.68764	413.3%	87.3%	\$ 18,690.00	101	62	39	\$ 11,055.00	
E-MINI NASDAQ ...	@NQ...	Trading	-0.50212	22.4%	1.8%	\$ 1,015.00	48	26	22	\$ 18,850.00	
MINI RUSSELL 2...	@TF...	Optimizati...	11.25917	271.3%	13.9%	\$ 12,295.02	37	26	11	\$ 34,360.00	
MINI RUSSELL 2...	@TF...	Trading	226.1727	1223.3%	248.5%	\$ 55,444.99	39	26	13	\$ 11,930.00	
E-MINI DOW JON...	@YM...	Optimizati...	121.1038	620.8%	131.7%	\$ 28,075.00	83	60	23	\$ 17,575.00	
E-MINI DOW JON...	@YM...	Trading	-6.46244	-49.5%	-9.6%	\$ -2,240.00	41	23	18	\$ 15,640.00	
[ALL INSTRUME...	[AVG]	Optimizati...	25.95117	752.4%	142.9%	\$ 34,092.00	79	53	26	\$ 34,360.00	
[ALL INSTRUME...	[AVG]	Trading	14.16411	395.6%	84.2%	\$ 17,929.50	44	26	18	\$ 23,390.00	

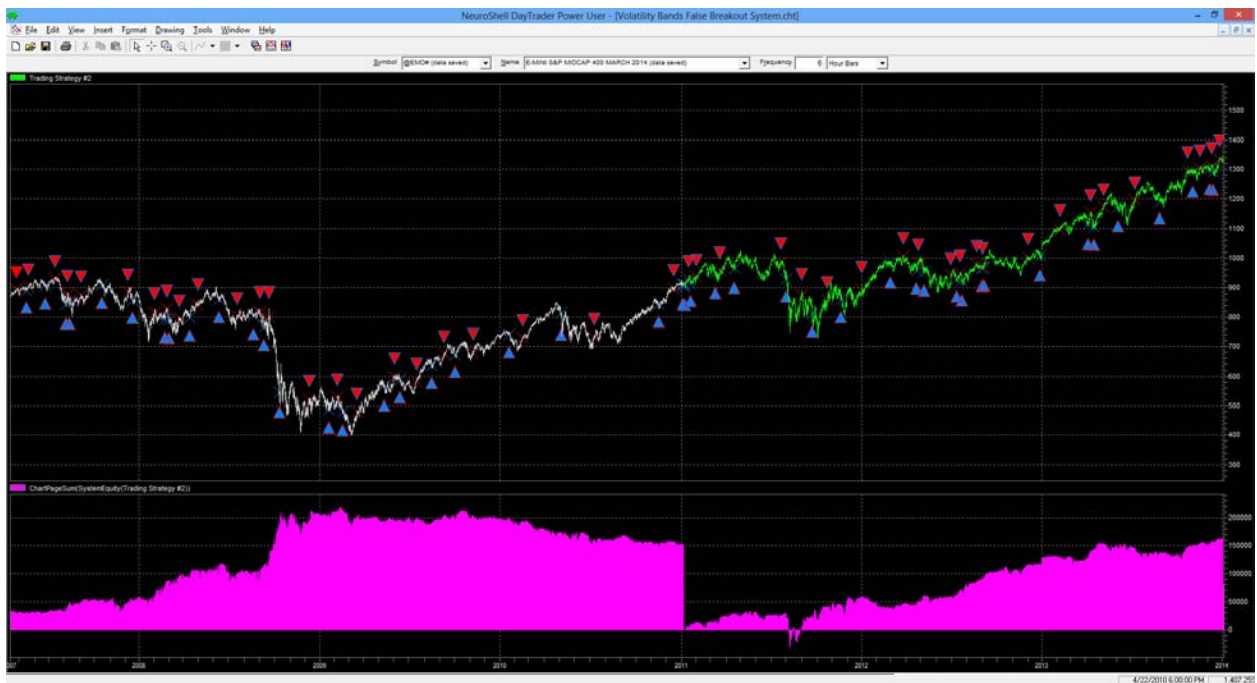


Bollinger Band Results (Trading Strategy #2):

Trading Strategy Wizard - [Trading Strategy #2]

Trading Strategy Results Summary

Name	Symbol	Data Set	Return * Log Equity Correlation	Ret on Trades	1yr Ret on Account	Net Profit	#Trades	#Winning Trades	#Losing Trades	Max Drawdown
E-MINI S&P MIDC...	@EM...	Optimizati...	64.99806	444.6%	118.9%	\$ 20,150.00	46	27	19	\$ 44,965.02
E-MINI S&P MIDC...	@EM...	Trading	587.116	1817.3%	605.1%	\$ 82,369.98	44	36	8	\$ 18,120.00
E-MINI S&P 500 ...	@ES...	Optimizati...	156.1136	960.0%	174.5%	\$ 43,560.00	138	69	49	\$ 22,022.50
E-MINI S&P 500 ...	@ES...	Trading	165.7394	540.9%	180.1%	\$ 24,542.50	74	48	26	\$ 12,197.50
E-MINI NASDAQ ...	@NQ...	Optimizati...	23.90034	226.5%	47.8%	\$ 10,245.00	127	78	48	\$ 14,865.00
E-MINI NASDAQ ...	@NQ...	Trading	46.73749	262.1%	60.3%	\$ 11,855.00	64	42	22	\$ 10,815.00
MINI RUSSELL 2...	@TF...	Optimizati...	147.6004	931.4%	265.8%	\$ 42,215.01	35	20	15	\$ 19,894.99
MINI RUSSELL 2...	@TF...	Trading	110.2851	767.6%	121.7%	\$ 34,790.00	38	25	13	\$ 21,200.00
E-MINI DOW JON...	@YM...	Optimizati...	86.38617	496.7%	93.7%	\$ 22,465.00	87	57	30	\$ 15,595.00
E-MINI DOW JON...	@YM...	Trading	-0.10516	-0.9%	-0.2%	\$ -40.00	53	31	22	\$ 17,805.00
(ALL INSTRUME...	(AVG)	Optimizati...	19.15995	611.8%	140.1%	\$ 27,727.00	87	54	32	\$ 44,965.02
(ALL INSTRUME...	(AVG)	Trading	36.39091	677.4%	193.4%	\$ 30,703.50	55	36	18	\$ 21,200.00

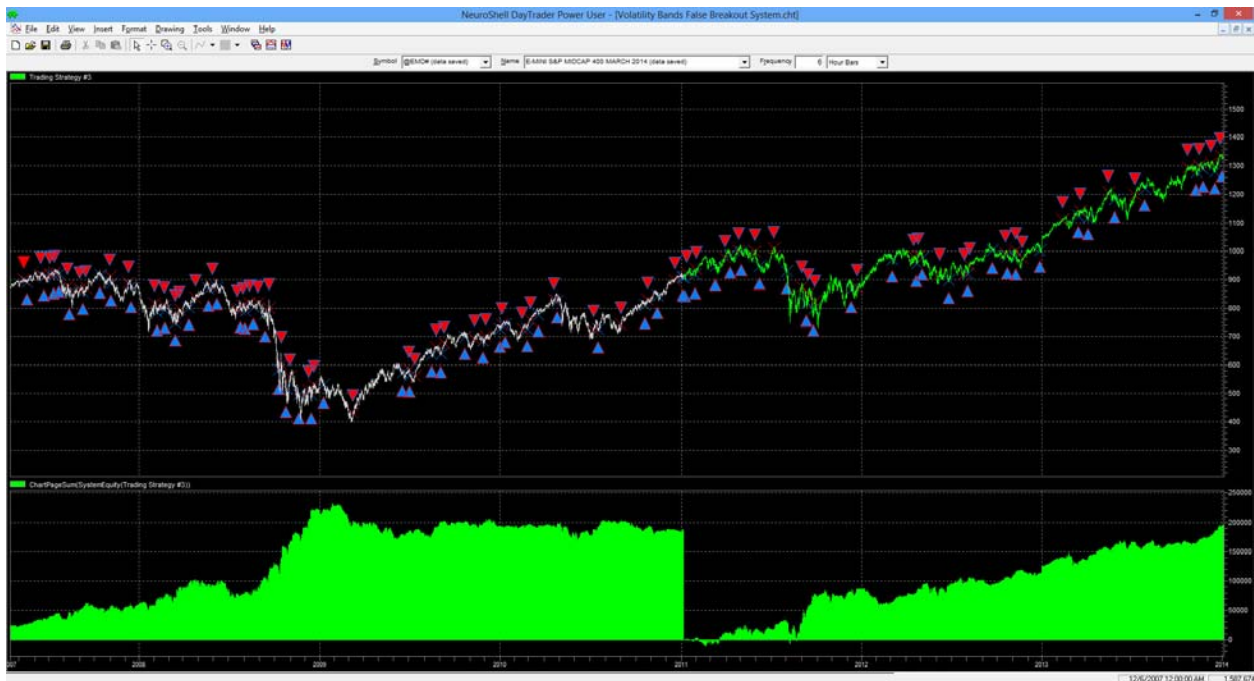


FFilter Keltner Channel Results (Trading Strategy #3):

Trading Strategy Wizard - [Trading Strategy #3]

Trading Strategy Results Summary

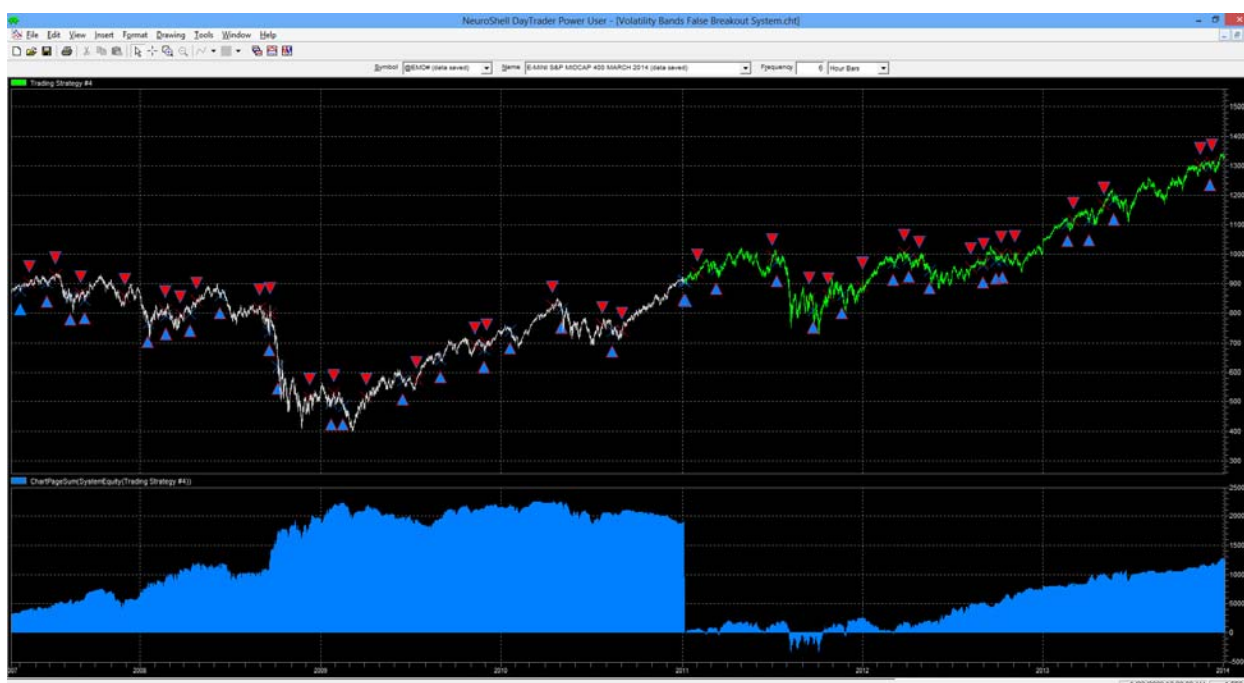
Name	Symbol	Data Set	Return * Log Equity	Correlation	Ret on Trades	1yr Ret on Account	Net Profit	#Trades	#Winning Trades	#Losing Trades	Max Drawdown
E-MINI S&P MIDC...	@EM...	Optimizati...	135.8111	848.3%	184.3%	184.3%	\$ 38,449.98	78	52	26	\$ 34,279.99
E-MINI S&P MIDC...	@EM...	Trading	465.7285	1625.7%	541.3%	541.3%	\$ 73,685.05	53	41	12	\$ 18,170.00
E-MINI S&P 500 ...	@ES...	Optimizati...	151.1591	1052.3%	197.3%	197.3%	\$ 47,747.50	93	65	28	\$ 14,987.50
E-MINI S&P 500 ...	@ES...	Trading	93.94313	625.5%	106.5%	106.5%	\$ 28,382.50	46	36	10	\$ 7,652.50
E-MINI NASDAQ ...	@NQ...	Optimizati...	95.41647	632.9%	127.1%	127.1%	\$ 28,625.00	91	58	33	\$ 14,520.00
E-MINI NASDAQ ...	@NQ...	Trading	37.52061	371.4%	41.5%	41.5%	\$ 16,795.00	46	31	15	\$ 14,255.00
MINI RUSSELL 2...	@TF...	Optimizati...	80.02287	496.2%	108.1%	108.1%	\$ 22,490.01	48	30	18	\$ 25,060.00
MINI RUSSELL 2...	@TF...	Trading	277.2298	900.3%	299.8%	299.8%	\$ 40,805.06	51	35	16	\$ 23,530.00
E-MINI DOW JON...	@YM...	Optimizati...	86.49686	818.2%	93.7%	93.7%	\$ 37,005.00	78	53	25	\$ 14,640.00
E-MINI DOW JON...	@YM...	Trading	125.8994	615.6%	129.1%	129.1%	\$ 27,840.00	53	36	17	\$ 9,665.00
(ALL INSTRUME...	(AVG)	Optimizati...	23.55626	769.6%	142.1%	142.1%	\$ 34,863.50	78	52	26	\$ 34,279.99
(ALL INSTRUME...	(AVG)	Trading	40.81286	827.7%	223.6%	223.6%	\$ 37,501.52	50	36	14	\$ 23,530.00



FFilter Bollinger Band Results (Trading Strategy #4):

Trading Strategy Wizard - [Trading Strategy #4]

Trading Strategy Results Summary											
Name	Symbol	Data Set	Return * Log Equity	Correlation	Ret on Trades	1yr Ret on Account	Net Profit	#Trades	#Winning Trades	#Losing Trades	Max Drawdown
E-MINI S&P MIDC...	@EM...	Optimizati...	247.8607		1061.3%	284.0%	\$ 48,104.98	37	27	10	\$ 21,370.00
E-MINI S&P MIDC...	@EM...	Trading	37.18272		366.7%	58.9%	\$ 16,620.01	30	20	10	\$ 22,700.00
E-MINI S&P 500 ...	@ES...	Optimizati...	223.7548		1264.0%	237.0%	\$ 57,355.00	134	87	47	\$ 16,080.00
E-MINI S&P 500 ...	@ES...	Trading	118.7603		466.6%	132.0%	\$ 21,172.50	63	42	21	\$ 12,322.50
E-MINI NASDAQ ...	@NQ...	Optimizati...	102.3602		532.4%	112.5%	\$ 24,080.00	98	66	31	\$ 12,545.00
E-MINI NASDAQ ...	@NQ...	Trading	0.78467		103.9%	11.3%	\$ 4,700.00	62	37	25	\$ 17,405.00
MINI RUSSELL 2...	@TF...	Optimizati...	56.98409		338.3%	100.1%	\$ 15,335.01	27	18	9	\$ 23,840.00
MINI RUSSELL 2...	@TF...	Trading	150.389		1004.0%	172.6%	\$ 45,505.02	31	24	7	\$ 22,945.01
E-MINI DOW JON...	@YM...	Optimizati...	108.0522		738.5%	120.1%	\$ 33,400.00	93	58	35	\$ 19,095.00
E-MINI DOW JON...	@YM...	Trading	124.5204		661.7%	131.8%	\$ 29,925.00	53	37	16	\$ 17,230.00
(ALL INSTRUME...	(AVG)	Optimizati...	29.56088		786.9%	170.7%	\$ 35,655.00	78	51	26	\$ 23,840.00
(ALL INSTRUME...	(AVG)	Trading	17.26548		520.6%	101.3%	\$ 23,584.51	48	32	16	\$ 22,945.01



A few things stick out to me upon closer inspection of the results. First, the fact that this simple entry technique is able to generate strong returns regardless of the type of volatility band being used shows me that it has promise. In fact, the lowest out-of-sample average for annual return on account was 84.2% with standard Keltner Channels. Second, the BMJ Fractal Filter variations of Bollinger Bands and Keltner Channels were slightly more consistent in their results. Both types of Fractal Filter bands made money on all five securities both in and out-of-sample. Although the standard Bollinger Bands outperformed their FFilter counterparts on average, they lost a small amount of money out-of-sample on the e-mini Dow Jones. The Keltner Channels lost money on two of the five securities traded and only made a small amount on another, meaning almost all of their profits came from only two securities. The returns are still strong on average, but I'd like to see more consistency across the instruments traded.

The standout of the group appears to be the BMJ Fractal Filtered variation of Keltner channels (Strategy #3). The system using these was profitable on all five securities both in and out-of-sample. It made the most profits, generated the highest average return on account (223.6% annually out-of-sample), and achieved a 71.9% average percent profitable trades out-of-sample. When using these bands, the lowest annual return of the five securities was 41.5% during the out-of-sample period and all the others achieved triple-digit returns. Here's the detailed analysis for the group average of this system:

Performance Statistic	All Trades	Long Only	Short Only
Start Date	1/6/2011		
End Date	1/6/2014 6:00:00 AM		
Average Beginning Price	3,381.05		
Average Ending Price	4,852.15		
Average Change in Price	1,471.10		
Average Percent Change in Price	46.3%		
Average Annual Percent Chang...	15.4%		
Return on Trades	827.7%	759.4%	68.3%
Annual Return on Trades	275.6%	252.9%	22.7%
Average Return on Account	671.6%	607.5%	76.8%
Average Annual Return on Acc...	223.6%	202.3%	25.6%
Average Net Profit	\$ 37,501.52	\$ 34,406.51	\$ 3,095.012
Average Gross Profit	\$ 71,391.52	\$ 43,474.52	\$ 27,917.00
Average Gross Loss	\$ 33,889.99	\$ 9,068.001	\$ 24,821.99
Average Ratio Gross Profit/Loss	2.07	5.79	1.10
Average Percent Profitable Tra...	71.9%	85.0%	58.8%
Average Number Trades	50	25	25
Average Number Winning Trades	36	21	15
Average Number Losing Trades	14	4	10
Largest Winning Trade Profit	\$ 10,635.00	\$ 10,635.00	\$ 10,057.50
Largest Losing Trade Loss	\$ 10,125.00	\$ 9,365.001	\$ 10,125.00
Average Trade Profit	\$ 739.56	\$ 1,356.00	\$ 115.19
Average Winning Trade Profit	\$ 1,958.16	\$ 2,027.43	\$ 1,869.05
Average Losing Trade Loss	\$ 2,505.62	\$ 2,447.20	\$ 2,529.51
Ratio Avg Win/Avg Loss	0.80	0.84	0.75
Maximum Consecutive Winners	9	21	5
Maximum Consecutive Losers	3	3	6
Average Trade Span	62 bars	61 bars	64 bars
Average Winning Trade Span	45 bars	51 bars	36 bars
Average Losing Trade Span	108 bars	114 bars	106 bars
Longest Trade Span	342 bars	342 bars	257 bars
Longest Winning Trade Span	244 bars	244 bars	142 bars
Longest Losing Trade Span	342 bars	342 bars	257 bars
Largest Contracts Traded	1	1	1
Largest Winning Contracts Trad...	1	1	1
Largest Losing Contracts Traded	1	1	1
Average Contracts Traded	1	1	1
Average Winning Contracts Tra...	1	1	1
Average Losing Contracts Traded	1	1	1
Average Commissions Paid	\$ 1,937.00	\$ 975.00	\$ 962.00
Maximum Drawdown	\$ 23,530.00	\$ 21,640.00	\$ 17,769.99
Maximum Open Trade Drawdown	\$ 19,860.00	\$ 19,860.00	\$ 12,170.00
Average Required Account Size	\$ 7,721.00	\$ 7,189.00	\$ 7,554.50

It's important to note that these strategies are true reversal strategies. They do not include stops or exits and they do result in reasonably sizeable drawdowns. Some traders might find this a perfectly acceptable cost of achieving the returns illustrated. But others might prefer a lower risk profile at the expense of a slightly lower return. Our next article will illustrate how we might add stops and/or exits to an already successful trading system in order provide the opportunity for a reasonable return while controlling risk.

I hope some of you found this article to be helpful. If you have any questions regarding this strategy or anything else related to our products, please don't hesitate to contact either myself or my father, Dennis Voigt.

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