Bollinger Bands®
Trading Strategies
That Work

By

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Section 1

A Look at Bollinger Bands® and %b

Created by legendary money manager and researcher John Bollinger, Bollinger Bands® are one of the most popular indicators applied by traders throughout the world in nearly all markets. It's rare today to see a chart not accompanied by Bollinger Bands® as they've become a must have visualization tool which allows traders to see how overbought or oversold a security is.

There has been an abundance of information published on how to trade with Bollinger Bands®. Much of it though is discretionary in theory. The how-to-use Bollinger Bands® information usually pushes it back to the trader to interpret what the security's price is doing relevant to its Bands.

This Guidebook does not.

What you will learn is how to exactly identify overbought and oversold key levels with Bollinger Bands® and applying them knowing what the historical returns have been when they reached specific levels.

With the *Trading with Bollinger Bands®* Strategy Guidebook, you will learn how to identify the best historical entry and exit triggers, along with multiple levels of intraday pullbacks to increase the edges of the Bands. We'll also teach you various exit points to allow for even more flexibility in your trading.

We looked at every United States stock which has traded on average at least 250,000 shares a day priced above $5 a share from January 2001-May 2012 (the date we started writing the Guidebook). This includes all stocks along with those that were bought out, delisted, etc. You are seeing Bollinger Bands®, and especially the %b component of Bollinger Bands® in play every day on all liquid stocks for over a decade. From this you will see that the %b component of Bollinger Bands® has had significant predictive ability to short-term prices when it's properly applied. As a whole, you have one of the most robust quantified equity strategies for applying Bollinger Bands®.

Before describing the strategy, let's look at exactly what Bollinger Bands® are and also what we consider to be the genius within the Bollinger Bands®- the %b calculation - which we will specifically focus on.

What Are Bollinger Bands®?

Bollinger Bands® are used to measure the highness or lowness of the price relative to previous trades.

For the strategies in this Guidebook, Bollinger Bands® consist of:

> • an upper band at 1 times a 5-period standard deviation above the moving average.

> • a lower band at 1 times a 5-period standard deviation below the moving average.

The closer a security is to its lower level, the more oversold it is. The closer a security it is to its upper level, the more overbought it is.

Most research and strategies revolving around Bollinger Bands® use this concept and then tend to add other filters to this to create a strategy. As was just mentioned, few if any provide exact rules with multiple years of test results. In this Guidebook we have gone further by doing this for you.

In our opinion (which is backed by statistical results), the %b component of the Bollinger Bands® allows you to better pinpoint proper entry and exit levels when trading stocks.

%b is an indicator derived from Bollinger Bands®, and quantifies a security's price relative to the upper and lower Bollinger Band.

The default setting for %b is based on the default setting for Bollinger Bands® (5,1). The bands are set 1 standard deviation above and below the 5-day simple moving average, which is also the middle band. The security price is the close (or the last trade for intraday readings).

Here is the Calculation for %b

%b = (Price - Lower Band)/(Upper Band - Lower Band)

- %b equals 1 when price is at the upper band
- %b equals 0 when price is at the lower band
- %b is above 1 when price is above the upper band
- %b is below 0 when price is below the lower band
- %b is above .50 when price is above the middle band (5-day SMA)
- %b is below .50 when price is below the middle band (5-day SMA)

Ideally when buying a security we want the %b reading to be below 0.1 for multiple days. The lower the %b reading and the more days in a row below that reading, the more oversold the security is and the greater the historical edges have been. This is the key to trading with

Bollinger Bands® and by applying a few additional filters, you are then able to build strategies with high average gains per trade and high success rates over the past 11+ years.

You can plot the %b indicator at StockCharts.com (settings: 5,1).

Let's now go to the exact rules and parameters and then look at the historical test results.

Section 2

The Rules

When you're trading with Bollinger Bands® and especially the %b component of Bollinger Bands® you want to be as structured and rule-based as possible. Let's now go to the rules for trading in stocks.

1. The stock must be above $5 per share.

2. The stock's average daily volume over the past 21 days (one trading month) must be at least 250,000 shares per day. This assures we're in liquid stocks.

3. The stock's 100-day historical volatility is above 30. (See the Appendix for a definition of historical volatility).

4. The stock's 10 day Average Directional Index (ADX) is above 30. (See the Appendix for a definition of ADX).

5. The stock closes above its 200-day moving average.

6. The %b of the stock must be under X (X=0.1, 0, -0.1) Y days in a row (Y = 2, 3, 4). A close under 0 has the stock closing under its lower band.

7. If the above rules are met, buy the stock tomorrow on a further intraday limit Z% below today's closing price (Z= 4%, 6%, 8%, or 10%).

8. Exit the position when its %b closes above 1.0 (its upper band), exiting at the closing price. We'll also show the test results exiting when the stock closes above a %b level of 0.50, 0.75, on the first up close, using 2-period RSI exits, moving average exits, and exiting the same day (day trade). The goal here is to empower you with as much knowledge as possible when exiting the trade.

Let's now go deeper into Rules 3-8.

Rules 3 and 4 assure that the stock has enough volatility in order to allow for larger moves.

Rule 5 assures that the stock is in a longer-term uptrend.

Rule 6 is there to identify the pullback. A stock that closes below a %b level of 0.1 multiple days in a row is a good short-term pullback. We want the %b component of the Bollinger Bands® to be under a low level multiple days in a row. The lower the %b level of a stock, the more the stock is oversold and the greater its returns have been over the next one to two weeks.

Rule 7 helps make the %b pullback really stand-out. Whereas most pullback methods may have small edges, this rule assures that the pullback is even deeper and because it's occurring intraday, it's often accompanied by a lot of fear. Money managers especially get nervous and

often tell their head traders to "just get me out" after they have made the decision to sell. This panic creates the opportunity. We want to buy the stock on an intraday basis on a further pullback intraday with a limit order. What we are doing is taking an already oversold stock as measured by the %b and then waiting for it to become even more oversold intraday.

Rule 8 assures that we have a disciplined, quantized exit in place. Few strategies have quantified, structured, and disciplined exit rules. Rule 8 gives you the exact parameters to exit the trade backed by over a decade of historical test results.

Let's now look at the test results.

Section 3

Test Results

When traders ask what is a good edge (meaning the average gain per trade) on a short–term basis (three to ten trading days), the rule of thumb is ½% up to 2.5% per trade. This includes all trades.

The average gain per trade is the number of winning trades times their average gain minus the losing trades times their average loss divided by the total trades. So, if is system has a total of 100 trades and 60% make 2% on average and 40% lose 1% on average you have 120% minus 40% divided by 100. In this example the average gain per trade is 0.80%.

Short-term edges on the long side often exist because of fear. This fear is a manifestation of the market participants and takes the form of market fear and/or individual stock fear. The greatest edges appear when fear is at the highest. When everyone becomes afraid, they sell their stocks mostly out of preservation. Think of the known phenomenon of fight or flight. When there is mass selling, traders and investors are in flight mode. And this is where securities become mispriced on a short-term basis and the opportunities arise.

There are a number of components to market fear. The two most prevalent are caused by large price sell-offs, or shocks to the market. The other is caused by time. We've seen this over and over again in quantified testing. The longer the sell-off, the greater the fear that sets in, and the greater the edges that exist.

A third aspect is intraday fear. It's one of the most powerful yet least written about aspects of trading. Take a stock (or market), sell it off multiple days and then hit it hard intraday. That intraday sell-off is often pure panic. And when they panic, they sell at any price and create large opportunities for you. You'll see this when we look at the Bollinger Bands® strategy and look to buy intraday at extreme intraday pullback levels. The historical returns (edges) are extremely high.

Let's now look at the top 20 returns per variation of The Bollinger Bands® Strategy. These are the returns for the 11+-year period from January 2001-May 2012 (the time this is being written). With these test results we'll use an exit when the stock closes above its %b reading of 1.0. In a later chapter we'll look at the results using other exits.

The gains and edges here have been substantial, especially for the largest intraday pullbacks; those that have pulled back 6% up to 10%.

Table 3.1. Top 20 Strategies Based on Average Gain Per Trade

# Trades	Avg % Profit/Loss	Avg Days Held	% of Winners	Exit Method	Entry Limit	%b Cut-off	Days Under	Use Rule 3 and 4
217	7.86%	6.35	76.04%	%b>1	10	0.0	4	Yes
83	7.86%	6.43	73.49%	%b>1	10	-0.1	4	Yes
145	6.51%	7.01	75.86%	%b>1	8	-0.1	4	Yes
493	6.23%	6.50	73.43%	%b>1	10	0.0	3	Yes
434	6.20%	6.56	73.73%	%b>1	10	0.1	4	Yes
411	6.18%	6.49	77.37%	%b>1	8	0.0	4	Yes
569	5.86%	6.79	73.46%	%b>1	10	0.0	4	No
212	5.48%	6.76	71.23%	%b>1	10	-0.1	4	No
236	5.28%	7.09	69.92%	%b>1	10	-0.1	3	Yes
818	5.21%	6.70	71.76%	%b>1	10	0.1	3	Yes
914	5.15%	6.49	73.85%	%b>1	8	0.0	3	Yes
840	5.13%	6.49	74.76%	%b>1	8	0.1	4	Yes
790	4.96%	7.08	71.77%	%b>1	10	-0.1	2	Yes
1175	4.95%	6.91	72.51%	%b>1	10	0.0	2	Yes
441	4.94%	6.89	72.11%	%b>1	8	-0.1	3	Yes
270	4.77%	6.76	71.85%	%b>1	6	-0.1	4	Yes
1107	4.70%	7.01	70.46%	%b>1	10	0.1	4	No
1301	4.65%	7.14	69.33%	%b>1	10	0.0	3	No
1590	4.61%	6.98	71.51%	%b>1	10	0.1	2	Yes
813	4.55%	6.34	74.66%	%b>1	6	0.0	4	Yes

Here is an explanation of each column:

 # Trades is the number of times this variation triggered from January 1, 2001-May 31, 2012. Each variation has had hundreds and in some cases over 1000 signals trigger.

Average % Profit/Loss is the average gain for all trades (including the losing trades). The top 20 variations have shown gains on average from 4.55% per trade all the way up to 7.86% (an extremely high number for stocks).

Average Days Held is the number of days on average the trade was held. In all cases it's in the 6 to 8 day range.

% of Winners is the % of signals which closed out at a profit. The majority have been above 70%, an extremely high level, especially in a world where most successful traders look to be correct 55%-60% of the time.

Exit Method is a %b close above 1.0. We'll look at other exits as we move ahead.

Entry Limit is the intraday pullback used to trigger an entry. This means that the buy trigger occurs the next day X% below the signal day. Therefore if today comes in with a signal, the signal is executed only if the stock pulls back further. In our testing we looked at 4%-10% limits. As you can see 8% and 10% predominate the list and further reinforce the fact that the larger the intraday pullback, the greater the edges have been using Bollinger Bands®.

%b Cut-Off is the %b Level. We tested 0.1, 0.0 and -0.1. The test results predominantly show that the lower the %b level, the more oversold the stock is and the better the historical returns have been.

Days Under is the number of days under the %b cut-off level. We tested two, three, and four days under the %b cut-off level. As you can see, the more days the stock is under its cut-off level, the more oversold the stock is and the higher the average gains per trade have been.

The two best performing variations have been 4 days under 0.0 or -0.1 with a 10% limit order. The -0.1 cut-off level doesn't occur as often and therefore the 0.0 level is preferred as it gives more trades.

What you have here is 20 different variations of %b showing consistent behavior over more than a decade's period of time. The key is to lock down the variation or variations that fit best for you and then apply them in a systematic structured trading manner. %b as applied with these rules has shown consistent healthy edges for over a decade.

Let's now look at the 20 highest performing variations by percentage correct using the same exit.

Table 3.2. Top 20 Strategies Based on Percent Winners

# Trades	Avg % Profit/Loss	Avg Days Held	% of Winners	Exit Method	Entry Limit	%b Cut-off	Days Under	Use Rule 3 and 4
411	6.18%	6.49	77.37%	%b>1	8	0.0	4	Yes
217	7.86	6.35	76.04%	%b>1	10	0.0	4	Yes
145	6.51	7.01	75.86%	%b>1	8	-0.1	4	Yes
840	5.13	6.49	74.76%	%b>1	8	0.1	4	Yes
813	4.55	6.34	74.66%	%b>1	6	0.0	4	Yes
914	5.15	6.49	73.85%	%b>1	8	0.0	3	Yes
434	6.2	6.56	73.73%	%b>1	10	0.1	4	Yes
1546	3.13	6.21	73.61%	%b>1	4	0.0	4	Yes
2144	4.32	6.73	73.55%	%b>1	8	0.0	2	Yes
83	7.86	6.43	73.49%	%b>1	10	-0.1	4	Yes
569	5.86	6.79	73.46%	%b>1	10	0.0	4	No
493	6.23	6.50	73.43%	%b>1	10	0.0	3	Yes
519	3.82	6.47	73.41%	%b>1	4	-0.1	4	Yes
1628	3.77	6.34	73.40%	%b>1	6	0.1	4	Yes
3146	2.78	6.03	73.08%	%b>1	4	0.1	4	Yes
1787	3.85	6.40	72.75%	%b>1	6	0.0	3	Yes
1092	4.52	6.70	72.71%	%b>1	8	0.0	4	No
2195	3.47	6.50	72.57%	%b>1	6	0.0	4	No
1175	4.95	6.91	72.51%	%b>1	10	0.0	2	Yes
1788	2.87	6.43	72.48%	%b>1	4	-0.1	3	Yes

When looking at the variations which have been correct the most, we see a broader array of variations. The percentage of winners ranges from as low as 72.48% up to as high as 77.37% for the time period from 2001 up through May 2012. These numbers again confirm the power of applying Bollinger Bands® and %b to your trading.

You're now in possession of numerous systematic ways to precisely trade with Bollinger Bands® and %b. Let's now expand this knowledge by looking at different exit strategies.

Section 4

The Role of Exits

In this section, we're going to expand your knowledge of trading with Bollinger Bands® by introducing various exit strategies. As you will see, these exit strategies improve the historical results even further and provide you with greater opportunities to trade with Bollinger Bands® and %b.

We looked at seven different exit strategies.

They are:

1. a %b reading of above 1.0.

2. a %b reading of above 0.75.

3. a %b reading of above 0.50.

4. a 2-period RSI above 70.

5. a 2-period RSI above 50.

6. closing price above the 5-period simple moving average.

7. closing price above the 3-period simple moving average.

Here are the results of the best performing variations combined with the exits.

Table 4.1. Top 20 Strategies Based on Average Gain Per Trade

# Trades	Avg % Profit/Loss	Avg Days Held	% of Winners	Exit Method	Entry Limit	%b Cut-off	Days Under	Use Rule 3 and 4
217	7.86%	6.35	76.04%	%b>1	10	0	4	Yes
83	7.86%	6.43	73.49%	%b>1	10	-0.1	4	Yes
217	7.33%	6.02	76.50%	RSI2>70	10	0	4	Yes
217	6.79%	5.12	76.96%	%b>.75	10	0	4	Yes
83	6.68%	5.81	73.49%	RSI2>70	10	-0.1	4	Yes
83	6.62%	3.92	78.31%	C>MA5	10	-0.1	4	Yes
83	6.62%	3.92	78.31%	%b>.5	10	-0.1	4	Yes
145	6.51%	7.01	75.86%	%b>1	8	-0.1	4	Yes
217	6.44%	4.08	80.65%	C>MA5	10	0	4	Yes
217	6.44%	4.08	80.65%	%b>.5	10	0	4	Yes
145	6.34%	3.66	82.76%	C>MA5	8	-0.1	4	Yes
83	6.34%	5.01	74.70%	%b>.75	10	-0.1	4	Yes
145	6.34%	3.66	82.76%	%b>.5	8	-0.1	4	Yes
83	6.27%	3.47	77.11%	RSI2>50	10	-0.1	4	Yes
493	6.23%	6.50	73.43%	%b>1	10	0	3	Yes
434	6.20%	6.56	73.73%	%b>1	10	0.1	4	Yes
411	6.18%	6.49	77.37%	%b>1	8	0	4	Yes
145	6.16%	5.92	79.31%	RSI2>70	8	-0.1	4	Yes
434	6.10%	6.13	74.42%	RSI2>70	10	0.1	4	Yes
412	6.09%	5.80	78.64%	RSI2>70	8	0	4	Yes

A close above a %b reading of 1.0 is still the best performing variation. When you add in the other exits you now see all 20 variations averaging over 6% per trade. The robustness has increased and you now have multiple exit points you can use to exit your positions.

Table 4.2. Top 20 Strategies Based on Percent Winners

# Trades	Avg % Profit/Loss	Avg Bars Held	% of Winners	Exit Method	Entry Limit	%b Cut-off	Days Under	Use Rule 3 and 4
145	6.34%	3.66	82.76%	C>MA5	8	-0.10	4	Yes
145	6.34%	3.66	82.76%	%b>.5	8	-0.10	4	Yes
413	5.49%	3.88	81.60%	C>MA5	8	0.00	4	Yes
413	5.49%	3.88	81.60%	%b>.5	8	0.00	4	Yes
145	6.02%	3.15	80.69%	RSI2>50	8	-0.10	4	Yes
217	6.44%	4.08	80.65%	C>MA5	10	0.00	4	Yes
217	6.44%	4.08	80.65%	%b>.5	10	0.00	4	Yes
145	5.51%	2.17	80.00%	C>MA3	8	-0.10	4	Yes
413	4.98%	3.53	79.42%	RSI2>50	8	0.00	4	Yes
145	6.16%	5.92	79.31%	RSI2>70	8	-0.10	4	Yes
413	5.64%	5.00	79.18%	%b>.75	8	0.00	4	Yes
217	5.95%	3.76	78.80%	RSI2>50	10	0.00	4	Yes
414	4.56%	2.57	78.74%	C>MA3	8	0.00	4	Yes
412	6.09%	5.80	78.64%	RSI2>70	8	0.00	4	Yes
83	6.62%	3.92	78.31%	C>MA5	10	-0.10	4	Yes
83	6.62%	3.92	78.31%	%b>.5	10	-0.10	4	Yes
217	5.34%	2.80	77.88%	C>MA3	10	0.00	4	Yes
845	4.22%	3.33	77.63%	RSI2>50	8	0.10	4	Yes
844	4.48%	3.89	77.61%	C>MA5	8	0.10	4	Yes
844	4.48%	3.89	77.61%	%b>.5	8	0.10	4	Yes

Two main things stand out:

1.   By looking at the additional exit strategies, the % correct goes up by a healthy amount. We now see strategy variations showing percent correct levels of 77.61% all the way up to 82.76%.

2.   The average holding period for the trades drops significantly, especially for exits such as a closing price above the 3-period simple moving average. The edges are less than the other exit strategies but in many cases the holding period is cut in half. This further allows you to decide which variations and exits fit you best.

Summary

As you can see, knowing how to exit a Bollinger Bands® trade is as important as knowing when to enter one. By looking at various precise exit points, you're able to see more variations with high edges and a historically high probability of trading success.

Section 5

Day Trading with Bollinger Bands®

Even though this is not a day trading Guidebook, we wanted to show you the intraday edges that exist with specific variations. These variations can be automated for your trading.

Successful day trading is mostly a game of pennies. The best firms and individual traders who day trade look to scalp for a small amount. Using Bollinger Bands® and %b as taught in the previous chapters show that intraday edges do exist.

The larger day trading firms look for edges as little as 0.1% up to 0.5% per trade (they can trade for tiny commission amounts along with receiving rebates). Individual traders need larger edges and those edges are often difficult to find over longer-term periods of time. By using Bollinger Bands® though we can see that edges have existed for over a decade.

Below you will see the 10 largest intraday historical edges ranging from 1.5% per trade up to 1.87% per trade.

Table 5.1. The Ten Largest Intraday Bollinger Band® Strategy Historical Edge

# Trades	Avg % Profit/Loss	% of Winners	Exit Method	Entry Limit	Cut off	Days Under	Use Rule 3 and 4
223	1.87%	63.68%	Day Trade	10	-0.10	4	No
2437	1.84%	66.23%	Day Trade	10	-0.10	2	No
607	1.70%	64.25%	Day Trade	10	0.00	4	No
3632	1.68%	65.12%	Day Trade	10	0.00	2	No
854	1.65%	64.40%	Day Trade	10	-0.10	2	Yes
87	1.64%	64.37%	Day Trade	10	-0.10	4	Yes
4845	1.63%	65.16%	Day Trade	10	0.10	2	No
156	1.62%	60.26%	Day Trade	8	-0.10	4	Yes
255	1.60%	64.71%	Day Trade	10	-0.10	3	Yes
1307	1.50%	63.12%	Day Trade	10	0.00	2	Yes

The variation that intrigues us the most is the 7th one, which requires the setup day to only have two consecutive days with %b readings under 0.1, followed by buying the stock at a 10% limit and exiting on the close.

There have been 4845 simulated trades since 2001 with over 65% of the signals being profitable (this is very high for any day trading strategy) and an average gain of 1.63% per trade (over three times higher than what the best trading firms strive for). Because these setups occur so often they offer traders ample opportunities throughout the year.

Summary

With overnight positions the stocks need to be at extreme Bollinger Bands® and %b levels. For day trading this is not the case. Simply having a stock at a basic %b oversold level and then waiting for it to sell-off intraday by 8%-10% allows for numerous trades to trigger at high success rates with healthy intraday edges.

Section 6

Trading Options with Bollinger Bands®

*Please note that the options section in the majority of the **Connors Research Trading Strategy Series** is the same because the strategy setups often involve large moves in brief periods of time. In our opinion, and confirmed from friends who are professional options traders (one with over three decades of experience); there is one best way to trade moves like these.*

Options trading has been a major growth industry over the past 5 years in the markets. This is because spreads have tightened, liquidity has increased and the ability to easily trade complex options has never been simpler.

We'll now focus on applying options trading to the short-term market moves we have just learned. Like everything else in this Guidebook, there are definitive rules as to how to execute an options trade when a strategy signal triggers.

Here is what we know based upon the data:

1. The majority of the moves from entry to exit have been held a very short period of time (6-7 trading days).

2. The average gains per trade have been large – well beyond the normal distribution of prices over that short period of time.

3. A high percentage of the moves have been correct.

When we look at this type of behavior, it can lead to many strategies but one strategy stands out (and this has been confirmed by professional traders). **The strategy is to buy front month, in-the-money long calls.**

Why front month in-the-money long calls? Because they will move the closest to the stock itself. And the closer an option moves with the stock, the greater the gain will be on a percentage basis when the move is correct.

Here are the rules.

1. A signal triggers.

2. Buy the front month in-the-money call. If you were to normally buy 500 shares of stock, buy 5 calls (every 100 shares should equal one call).

3. Exit the options when the signal triggers an exit on the stock.

Let's go further:

1. What does in-the-money exactly mean here?

In this case it's defined as <u>one to two strike prices in the money</u>. If the stock is at 48, buy the 40 or 45 calls.

2. What does front month mean?

Because the holding period is so short, you want to trade the options whose monthly expiration is the closest. If the closest month is 7 trading days or less from the front month's option expiration date (meaning the second Thursday before or closer) use the following month as the one to trade.

3. What happens if I'm in the position and it expires yet the signal for the stock is still valid?

In this case, roll to the next month. You're trading the stock signals so you want to have exposure to that signal.

4. What about liquidity and spreads?

There's some discretion here. There is no hard and fast rule as to what exactly liquidity means in options. For example, compare the liquidity of your stock to SPY, which is extremely liquid compared to a blue chip stock. Both can be considered liquid, but the blue chips option will be less liquid than SPY.

Assuming there is active volume in the options, look at the spreads. If the option is trading 3.00 bid -3.30 offer, the spread is 10%. Can you really overcome a 10% spread? Not likely. Now compare this to an option that's trading at 3.25 bid – 3.30 offer. This is far more acceptable and tradable.

5. What are the advantages of buying call options instead of the stock?

Assuming the spreads and liquidity are there, the advantages are large:

1. Greater potential ROI on capital invested.

2. Less money tied up.

3. Less points at risk. This means if a stock signals at 50, it can lose up to 50 points. The options can only lose up to the premium you paid. So, if you bought the 45 calls, the risk is only the premium.

4. There's greater flexibility. For example, let's say the stock triggered a buy signal at 50 and you paid 5.50 for the 45 calls. If the stock immediately moves higher (let's say to 56); you have choices here. You can exit, or you can roll into the 50 calls getting most

of your money out and now turning this into a nearly free trade if you believe that prices will continue to run.

There are numerous examples like this and you can find these types of strategy opportunities in most options books. But trading anything exotic or different other than simply buying the calls is against the advice of the many professionals we posed this question to.

In conclusion, options provide traders with a good alternative to buying the outright stock. The structured methodology for our strategies is: front-month, in-the-money, with equivalent sizing (1 option per 100 shares), and exiting when the signal exits.

The above options strategy, in many experts' opinion, is the best and most efficient strategy based upon the historical data from these signals.

Section 7

Additional Thoughts

1. As you have seen throughout this Guidebook, Bollinger Bands® and especially the %b component of the Bollinger Bands® have had large quantified edges when you apply them in a systematic manner.

2. There is preciseness here using Bollinger Bands® in this way. Use this preciseness to your advantage.

3. There are literally hundreds of potential variations for you to use. From the depth of the %b level, to the number of days below that level, to the size of the limit, and to the type of exit that can be applied. Look at the entire scope and then identify the variation or variations that fit best for your trading style.

4. What about stops (and we include the answer to this in all our Strategy Guidebooks)?

We have published research on stops in other publications including in our book *Short Term Trading Strategies That Work.*

What we have found is that stops tend to lessen performance, and in many cases they completely remove edges. Yes, it feels good when a stock keeps moving lower and lower and a stop got you out. On the other side, the research which is backed by up to two decades of test results on many short-term trading strategies suggests that stops get hit often and accumulate many, many losses. Few trading strategies can overcome these aggregated losses.

For many traders stops are a must. Psychologically it allows them to take trades, especially difficult trades. Whether you use them or not is a personal choice. On the whole though, the edges you see in this strategy and many other short-term strategies are lower when stops are applied to them. Again this is a personal choice only you can make for yourself. We know successful traders in both camps.

5. Slippage and commission were not used in the testing. Factor them into your trading (the entries are at limit prices so slippage is not an issue) and make sure you are trading at the lowest possible costs. Most firms are now allowing traders to trade for under 1 cent a share, so shop your business, especially if you are an active trader. The online brokerage firms want your business.

6. As you have seen here with the Bollinger Bands® Strategy, there are large edges in stocks which sell-off and then sell-off further intraday. These trades are often accompanied by fear and uncertainty and this is when large edges appear. Seek out these trades because as you have seen, they've been lucrative for many years.

We hope you enjoyed this addition to the Connors Research Trading Strategy Series. If you have any questions about this strategy please feel free to email us at info@connorsresearch.com

Appendix

RSI, Historical Volatility, and ADX Calculations

2-Period RSI

The 2-day RSI refers to the Relative Strength Index when set to read only the past two days of price action.

The Relative Strength Index (RSI) is a popular momentum oscillator developed by J. Welles Wilder in the 1970s. The RSI compares the magnitude of a market's recent gains to the magnitude of a market's recent losses.

A simple formula calculates this price action into a number between 1 and 100. Markets with RSIs closer to 1 are considered oversold. Markets with RSIs closer to 100 are considered overbought.

RSI = (100 – (100/(1+RS)))

RS = Average of x days up closes / Average of x days down closes

The RSI is generally set for 14-periods. However, for short-term ETF trading, we have found that a shorter time period is much more effective. See "2-day RSI", "RSI(4)".

There is a good example and explanation of the RSI found using this link: http://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:relative_strength_index_rsi
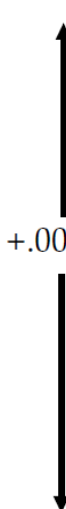
Historical Volatility

The historical volatility is defined as the standard deviation of the logarithmic price changes measured at regular intervals of time. Since settlement prices are usually considered the most reliable, the most common method of computing volatility involves using settlement-to-settlement price changes. We defined each price change, x_i, as:

$$x_i = \ln (P_i / P_{i-1})$$

where P_i is the price of the underlying contract at the end of the ith time interval.

P_i/P_{i-1} is sometimes referred to as the price relative.

Week	Underlying Price	$\ln(P_i/P_{i-1})$	Mean	Deviation from Mean	Deviation Squared
0	101.35				
1	102.26	+.008939		.007771	.000060
2	99.07	−.031692		−.032859	.001080
3	100.39	+.013236		.012069	.000146
4	100.76	+.003679		.002512	.000006
5	103.59	+.027699	+.001167	.026532	.000704
6	99.26	−.042698		−.043865	.001924
7	98.28	−.009922		−.011089	.000123
8	99.98	+.017150		.015982	.000255
9	103.78	+.037303		.036136	.001306
10	102.54	−.012020		−.013188	.000174
		+.011674			.005778

We first calculate the standard deviation of the logarithmic price changes:

$$\text{standard deviation} = \sqrt{(0.005778/9)}$$

$$= \sqrt{.000642}$$

$$= .025338$$

We then calculate the annual volatility by multiplying the standard deviation by the square root of the time interval between price changes.

Since we looked at price changes every week, the time interval is 365/7:

$$\text{annualized volatility} = .025338 \times \sqrt{(365/7)}$$

$$= .025338 \times \sqrt{52.14}$$

$$= .025338 \times 7.22$$

$$= .1829 \ (18.29\%)$$

Reprinted from: Nathanberg, Sheldon. Option Volatility & Pricing, Advanced Trading Strategies and Techniques, 2d ed., (Chicago: Probus Publishing, 1994), Appendix B.

Average Directional Index - ADX

ADX is an indicator used as a value for the strength of trend. ADX is non-directional so it will quantify a trend's strength regardless of whether it is up or down. You can find more information on the ADX at http://trd.mk/1C. Also, you can click here to see how to calculate ADX http://trd.mk/1D or here http://trd.mk/1E.

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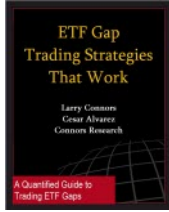
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This Professional Approach to ETF Trading Brings You Results Quickly

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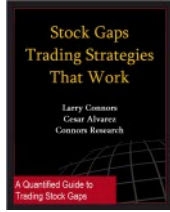
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