From the May 01, 2010 issue of Futures Magazine • Subscribe!

Fixing Bollinger bands

By David Rooke

May 1, 2010 • Reprints

Bollinger Bands are used widely in the trading community and are a key component of many trading strategies. By their nature, Bollinger bands offer a particular perspective of the market. But that perspective is not without its drawbacks.

This article will present a revised approach to the trading band concept with the aim of sharpening the focus of this class of indicator significantly. Both are valid and share a common heritage, but they are quite different under evaluation and in application. The derivation here is termed a volatility band. This article will explain why this derivation is necessary and how it is constructed and provide high-level preliminary test results.

Although the volatility bands are original in design and execution, they were inspired by Dennis McNicholl's work to improve Bollinger bands in the late 1990s ("Better Bollinger Bands," October 1998).

Houston, we have a problem

Popularized by John Bollinger, who gave them their name, Bollinger bands are simply a plot of a multiple of the standard deviation of price from its simple moving average (SMA), both above and below. By the use of standard deviation, we should reasonably expect that the distribution of price around the mean should conform to statistical normality, or get close to it.

Unfortunately, this is not the case for Bollinger bands and has led to a search to fix the problem. Based on observations of Bollinger bands, here are some of the issues:

• They are saddled with high lag, as virtually all SMA-based indicators are. Consequently, the user should be mindful of the delay in what the bands present.

• They do not envelope price in a manner consistent with a Gaussian distribution. That is, 68.2% of prices should be found within one standard deviation of the sample mean, 95.4% of prices should be found within two standard deviations of the mean, etc. This

will be described as the price/band ratio. While it can be debated whether daily price changes are normally distributed, the Bollinger price/band ratio can be said to offer little or no information from a probabilistic perspective.

• The price/band ratio is not scale invariant. That is, the price/band ratio from a given standard deviation does not remain constant as timescales increase. For example, see the following based on S&P 500 prices with 2xSD banding:

160-bar Bollinger bands:
Price/band ratio = 83.7%

80-bar Bollinger bands:
Price/band ratio = 86.2%

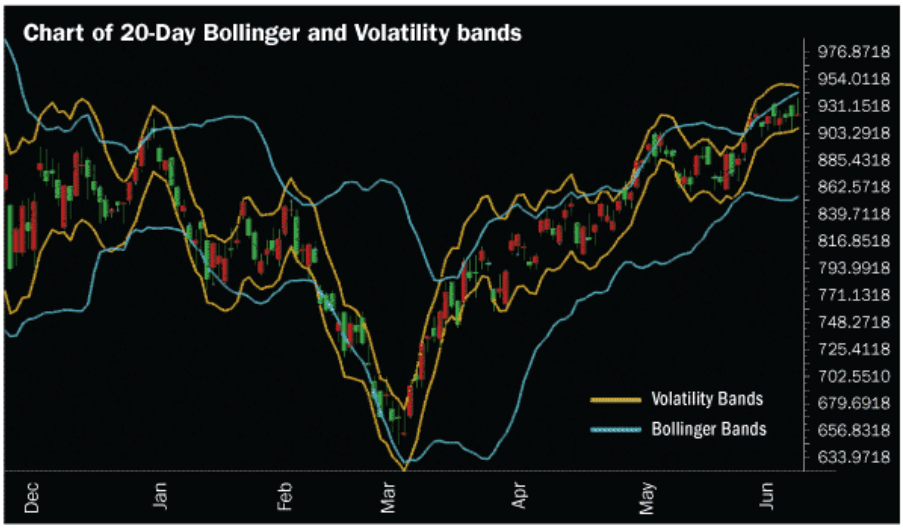
20-bar Bollinger bands:
Price/band ratio = 88.5%

• The movement of the bands against the moving average does not correlate with historical volatility. Seeing as Bollinger bands are intended, in part, to reflect changes in volatility, this is an issue.

Thankfully, these issues can be resolved in a practical way. By systematically addressing each of these issues in turn, we can construct an indicator that complements rather than replaces Bollinger bands and provides a useful additional trading tool. The solution is also simpler than anticipated.

VOLATILE SOLUTION

The volatility bands hug price much tighter than Bollinger bands, and they are far less sensitive to a sudden surge in volatility.



Source: TradersStudio

Volatility bands

Let us see how these so-called volatility bands address some of these issues before explaining how the bands are constructed. Maybe the best way to demonstrate this is with a chart (see "Volatile solution," left).

In this chart of the S&P 500, it's clear how tightly the volatility bands hug price changes relative to the slow and sometimes wild and wide gyrations of the Bollinger bands. Volatility bands achieve this through the application of a low lag moving average and

by calculating the standard deviation of price against that moving average. Note that the "standard" standard deviation function is an inappropriate tool for this.
The result is trading bands with low lag. Let's see how effectively these bands encapsulate S&P 500 prices at 2xSD:

160-bar volatility bands:
Price/band ratio = 94.6%

80-bar volatility bands:
Price/band ratio = 95.3%

20-bar volatility bands:
Price/band ratio = 95.7%

To validate this point let's take a peek at the numbers for 1xSD:

160-bar volatility bands:
Price/band ratio = 65.0%

80-bar volatility bands:
Price/band ratio = 66.9%

20-bar volatility bands:
Price/band ratio = 67.8%

PAGE 1 OF 2 NEXT > >>

RELATED ARTICLES

Daily Price Action: E-Mini S&P 500
S&P 500 surges after Fed's 'quantitative pleasing' (video)
Dow jumps 420 points, biggest gain since 2011
S&P 500 loves Yellen (even with misstep) (video)
Daily Price Action: E-mini S&P 500

PREVIOUS
Predicting price targets with the Rule of Seven

NEXT
Fixing Bollinger Bands: Codes and results

RELATED TERMS

Financials **10129** Equities & Indexes **2819**
John Bollinger **8** Bollinger Bands **5** trading tool **3**
David Rooke **2**