



Forward-adjusted Bollinger Bands

By making a couple of simple changes to Bollinger Bands, you can incorporate intra-bar price action and make the indicator more suited to real-time use.

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Bollinger Bands play a number of popular technical roles. The primary one is as a visual cue to prices being relatively high or low. Second, Bollinger Bands can identify low-volatility periods that often precede trends.

After walking through the basics of using Bollinger Bands, we'll show how a simple step can enhance the quality of the information provided by comparing the price action to the Bollinger Bands.

Band basics

By default, the upper and lower Bollinger Bands are placed two standard deviations above and below a 20-period simple moving average (SMA) of closing prices:

Upper band = 20-period SMA + 2 standard deviations

Middle line = 20-period SMA of closing prices

Lower band = 20-period SMA - 2 standard deviations

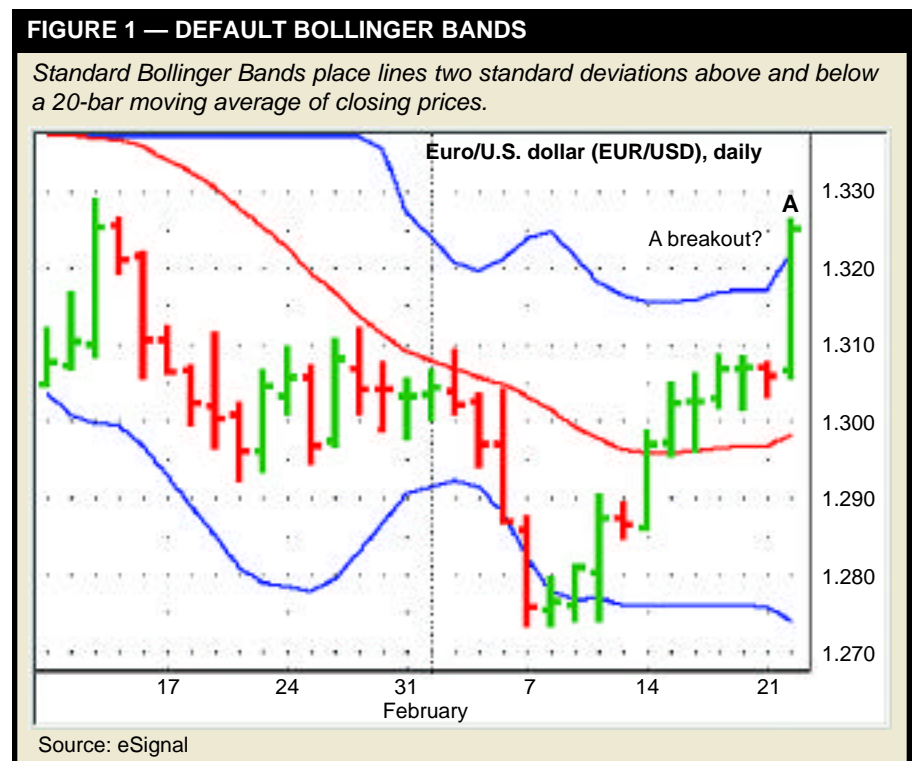
The upper and lower bands encompass the price action because the calcu-

lation of the bands uses a statistical measurement called standard deviation, which measures the how far the closing prices stray from the SMA of closing prices. Statistically, 95 percent of values will fall within two standard deviations of the average value, which means 95 percent of price action should occur within the upper and lower Bollinger Bands.

Incorporating intraday prices Figure 1 shows the default setup on a

daily chart of the Euro/U.S. dollar currency pair (EUR/USD). At bar A the price closes above the upper Bollinger Band, indicating the market is exceeding the level representing a 95-percent probability that price will close within the Bands. This could be a sign the market is trending, or it might be a sign the market has reached an overbought state.

Figure 2 plots an additional set of Bollinger Bands. The second set (the green bands) uses the high for each



day instead of the closing price. In this case, at bar A, price closes very near the upper band, which means this close is actually two standard deviations above the average high of the past 20 days.

Figure 3 adds one more set of Bollinger Bands (red). This time, the low price for each bar is used in the calculations. The close at bar A is well beyond the upper Bollinger Band.

Because Bollinger Bands are typically based on the closing prices, they filter price action — that is, they do not show how volatile a market has been on an intraday basis. By using either the high or low prices (or an average price), you incorporate intraday activity in the Bollinger Band calculation and have a fuller appreciation of whether the market is high or low relative to the total recent price action, rather than just the closing price for the day.

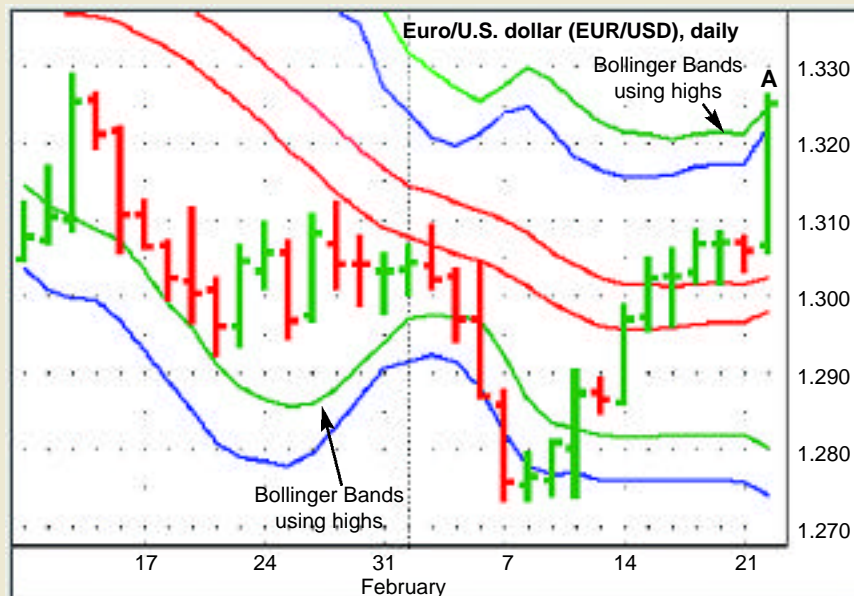
Advancing the Bands

Another aspect of Bollinger Bands is they are plotted using the current bar's values. Therefore, you don't know the value for the Bands for a given period until the bar closes. If you are tracking the market intraday and the price is rising, you will often see the Bollinger Band moving away from the prices: Price is rising and so is the upper Bollinger Band. In other words, the fixed frame of reference the Band should provide is not there because it is a "moving target," fluctuating as price fluctuates until the bar actually closes.

Figure 4 is a 45-minute chart of the Euro/U.S. dollar currency pair with 10-bar Bollinger Bands based on the average of the high and low for the bar $((high + low)/2)$. Many days markets trade in ranges, having discounted the news early in the day, after which they move sideways. Bollinger Bands could

FIGURE 2 — BOLLINGER BANDS BASED ON HIGH PRICE

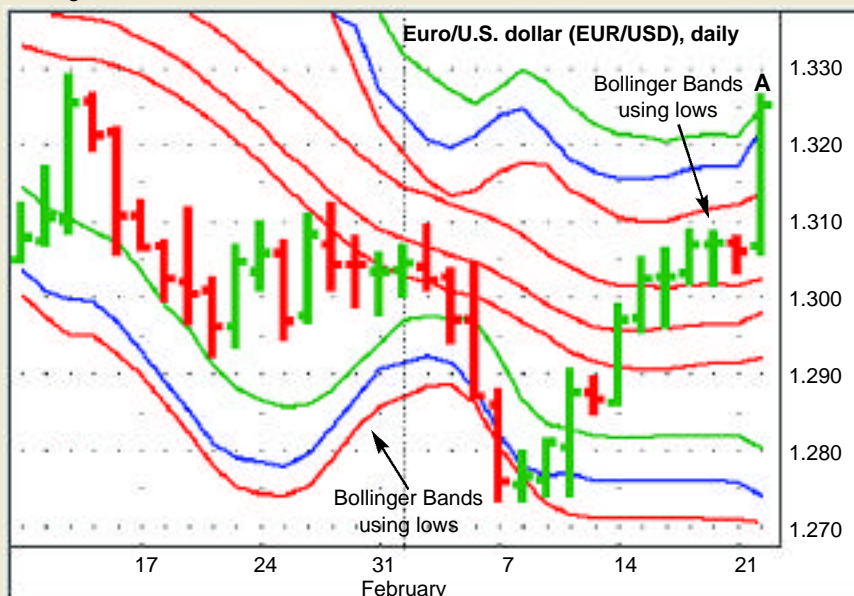
The green lines are Bollinger Bands that substitute the high price of each bar for the closing price.



Source: eSignal

FIGURE 3 — BOLLINGER BANDS BASED ON LOW PRICE

The red lines are Bollinger Bands based on the low price of each bar instead of the close. Notice in this case, the close at bar A is well beyond the upper Bollinger Band.



Source: eSignal

be very handy to identify when price is relatively high or low, or in the process of breaking out.

In Figure 4, it looks as if the Bollinger Bands are helpful in this regard, except that the Band values are

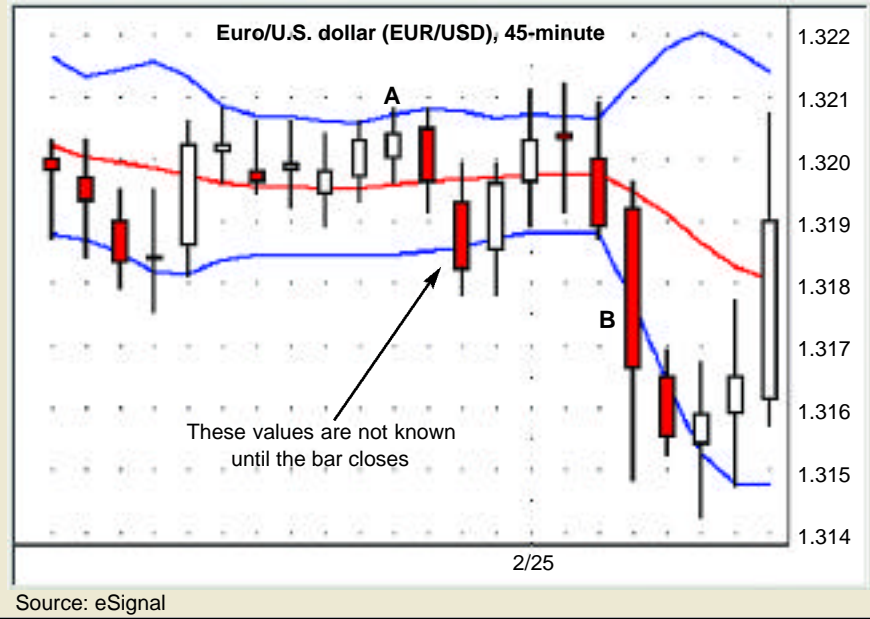
not known until the bar closes. In the first five minutes of a 45-minute bar, the Bollinger Band values could be very different from what they will be 40 minutes later.

At bar A, at the time when price was



FIGURE 4 — WAITING FOR THE CLOSE

Because Bollinger Band values are not determined until each price bar closes, it is difficult to determine (on an intra-bar basis) whether a move to or through a Band represents a meaningful price move.



wait for the bar to close to confirm the weakness.

It's difficult to determine whether the market is high or low or breaking out if your frame of reference is moving around with the price action. The solution is to plot the previous value of the Bollinger Bands on the current, or "live" bar. This gives you a fixed frame of reference. Once the previous bar closes, you have a set value for the Bollinger Bands, and you can assess the market in reference to these fixed indicator values.

Figure 5 is the same as Figure 4, except the Bollinger Bands are shifted one bar forward. Now, if the price trades up to the upper Band and starts to falter, you could conclude traders are unwilling to bid prices higher than the recent level (see bar A).

If the price action exceeds the forward-adjusted Bollinger Band, it indicates there has been a shift in psychology. For example, looking at Figure 4 again, at bar B the price action is breaking down and the Bollinger Bands falls with it. In Figure 5's bar B, the price action drops through the forward-adjusted Bollinger Band, and you know the market is trending: You don't have to wait to see if the close exceeds the lower Bollinger Band to confirm the downtrend.

In addition, the market often will break out only to be rejected and trade back into the range between the Bands — a sign of a false breakout that can be determined quickly using forward-adjusted Bollinger Bands, instead of having to wait for the bar to close.

Finally, using forward-adjusted Bollinger Bands offers a better way to develop testable rules for developing a systematic approach. The Bands can be compared to open, high, low, and closing prices of bars, which makes it possible to construct precise rules for trade setups and analyze the subsequent price action. 🕒

making its high, the Bollinger Band may well have been above the high, only to be pulled back down when the bar closed much lower than the high. Consequently, with the benefit of hind-

sight, the Bollinger Bands look like good support and resistance levels. Bar B closed well below the Bollinger Band and marked a downside breakout, but again, you would have had to

FIGURE 5 — FORWARD-ADJUSTED BOLLINGER BANDS

The price action in Figure 4 is shown here, this time with Bollinger Bands adjusted one bar forward. This provides a fixed indicator value to work with for the most recent price bar.

