Technical Analysis Using Bollinger Bands & RSI

Bollinger Bands
Developed by John Bollinger, Bollinger Bands allows users to compare volatility and relative price levels over a period time. Bollinger Bands are envelopes which surround the price bars on a chart. They are plotted two standard deviations away from a simple moving average. Because standard deviation is a measure of volatility, the bands adjust themselves to ongoing market conditions. They widen during volatile market periods and contract during less volatile periods. Bollinger Bands are, essentially, moving standard deviation bands.

Bollinger Bands are sometimes displayed with a third center line. This is the simple moving average line. Mr. Bollinger recommends using a 10 day moving average for short term trading, 20 days for intermediate term trading, and 50 days for longer term trading.

The standard deviation value may be varied. Increase the value from 2 standard deviations to 2-1/2 standard deviations away from the moving average when using a 50 day moving average. Conversely, lower the value from 2 to 1-1/2 standard deviations away from the moving average when using a 10 day moving average.

Bollinger Bands do not generate buy and sell signals alone. They should be used with another indicator such as Relative Strength (RSI). This is because when price touches one of the bands, it could indicate one of two things. It could indicate a continuation of the trend; or it could indicate a reaction the other way. By themselves they do not tell us when to buy and sell.

However, when combined with RSI, they become powerful. RSI is an excellent indicator with respect to overbought and oversold conditions. When price touches the upper band, and RSI is below 70, we have an indication that the trend will continue. When price touches the lower band, and RSI is above 30, we have an indication that the trend will continue.
If we run into a situation where price touches the upper band and RSI is above 70 approaching 80 we have an indication that the trend may reverse itself and move downward. On the other hand, if price touches the lower band and RSI is below 30 approaching 20 we have an indication that the trend may reverse itself and move upward.

Avoid using several different indicators all using same input data. If you're using RSI with the Bollinger Bands, don't use MACD too. They both use the same inputs. Consider using On Balance Volume, or Money Flow with RSI. Relying on different inputs they measure different things. They can be used together as further confirmation of a trend.

While there are many ways to use Bollinger Bands, following are a few rules that serve as a good beginning point. Bollinger Bands provide a relative definition of high and low.

That relative definition can be used to compare price action and indicator action to arrive at rigorous buy and sell decisions.

Appropriate signals can be derived from momentum, volume, sentiment, open interest, inter-market data, etc.
Volatility and trend have already been deployed in the construction of Bollinger Bands, so their use for confirmation of price action is not recommended.

The indicators used should not be directly related to one another. For example, you might use one momentum indicator and one volume indicator.

Bollinger Bands can also be used to clarify pure price patterns such as "M" tops and "W" bottoms, momentum shifts, etc.
Price can, and does, walk up the top Band and down the bottom Band.
Closes outside the Bollinger Bands are continuation signals, not reversal signals. This has been the basis for many successful breakout systems.
The default parameters of 20 periods for the moving average and standard deviation calculations, and 2 standard deviations for the bandwidth may be varied for the market.
The average deployed should not be the best one for crossovers. Rather, it should be descriptive of the intermediate-term trend.
If the average is lengthened the number of standard deviations needs to be increased simultaneously; from 2 at 20 periods, to 2.5 at 50 periods. If the average is shortened the number of standard deviations should be reduced; from 2 at 20 periods, to 1.5 at 10 periods.
Bollinger Bands are based upon a simple moving average. This is because a simple moving average is used in the standard deviation calculation and we wish to be logically consistent.
Make no statistical assumptions based on the use of the standard deviation calculation in the construction of the bands. The sample size in most deployments of Bollinger Bands is simply too small for statistical significance.

Finally, tags of the bands are just that, tags not signals. Touching the upper band is NOT in-and-of-itself a sell signal and touching the lower band is NOT in-and-of-itself a buy signal.
Again, this indicator consists of three bands encompassing a security's price action. Defaults are:
A simple moving average in the middle, usually 20 days for intermediate investing.
An upper band (20 day SMA plus 2 standard deviations)
A lower band (20 day SMA minus 2 standard deviations)
Standard deviation is a statistical term that provides a good indication of volatility. Using it ensures the bands will react quickly to price movements and reflect periods of high and low volatility. Sharp price changes and hence volatility, will lead to a widening of the bands.
Closing prices are usually used to compute Bollinger Bands. Other variations can also be used. The length of the moving average and number of deviations can be adjusted to better suit individual preferences and specific characteristics of a security.
One method to determine an appropriate moving average length is a visual assessment. Bollinger Bands should encompass the majority of price action, but not all. After sharp moves, penetration of the bands is normal. If prices appear to penetrate the outer bands too often, then a longer moving average may be required. If prices rarely touch the outer bands, then a shorter moving average may be required.
A more exact method to determine moving average length is by matching it with a reaction low after a bottom. For a bottom to form and a downtrend to reverse, a security needs to form a low that is higher than the previous low. Properly set Bollinger Bands should hold support established by the second (higher) low. If the second low penetrates the lower band, then the moving average is too short. If the second low remains above the lower band, then the moving average is too long. The same logic can be applied to peaks and reaction rallies. The upper band should mark resistance for the first reaction rally after a peak.
In addition to identifying relative price levels and volatility, Bollinger Bands can be combined with price action and other indicators to generate signals and foreshadow significant moves:
Double bottom buy (W): A double bottom buy signal is given when prices penetrate the lower band and remain above the lower band after a subsequent low forms. Either low can be higher or lower than the other. The important thing is that the second low remains above the lower band. The bullish setup is confirmed when the price moves above the middle simple moving average.
Double top sell (M): A sell signal is given when prices peak above the upper band and a subsequent peak fails to break above the upper band. The bearish setup is confirmed when prices decline below the middle band.
Sharp price changes can occur after the bands have tightened and volatility is low. In this instance, Bollinger Bands do not give any hint as to the future direction of prices. Direction must be determined using other indicators and aspects of technical analysis. Many securities go through periods of high volatility followed by periods of low volatility. Using Bollinger Bands, these periods can be easily identified with a visual assessment. Tight bands indicate low volatility and wide bands indicate high volatility.
Again, although Bollinger Bands can help generate buy and sell signals, they are not designed to determine the future direction of a security. The bands were designed to augment other analysis techniques and indicators. By themselves, Bollinger Bands serve two primary functions:
To identify periods of high and low volatility
To identify periods when prices are at extreme, and possibly unsustainable, levels.
As stated above, securities can fluctuate between periods of high volatility and low volatility. Being able to identify a period of low volatility can serve as an alert to monitor the price action of a security. Other aspects of technical analysis, such as momentum, moving averages and re-tracements, can then be employed to help determine the direction of the potential breakout.
Remember, buy and sell signals are not given when prices reach the upper or lower bands. Such levels merely indicate that prices are high or low on a relative basis. A security can become overbought or oversold for an extended period of time. Knowing whether prices are high or low on a relative basis enhances interpretation of other indicators and timing issues in trading.
Bollinger Bands are a pair of values placed as an "envelope" around a data field. The values are calculated by taking the moving average of the data for the given period and adding or subtracting the specified number of standard deviations for the same period from the moving average. Since Bollinger Bands use a moving average, the value at the beginning of a data series is not defined until there are enough values to fill the given period. Used to confirm trading signals, normally from a Momentum Indicator, the bands indicate overbought and oversold levels relative to a moving average.

The bands are calculated at specified standard deviations above and below the moving average, causing them to widen when prices are volatile and contract when prices are stable.

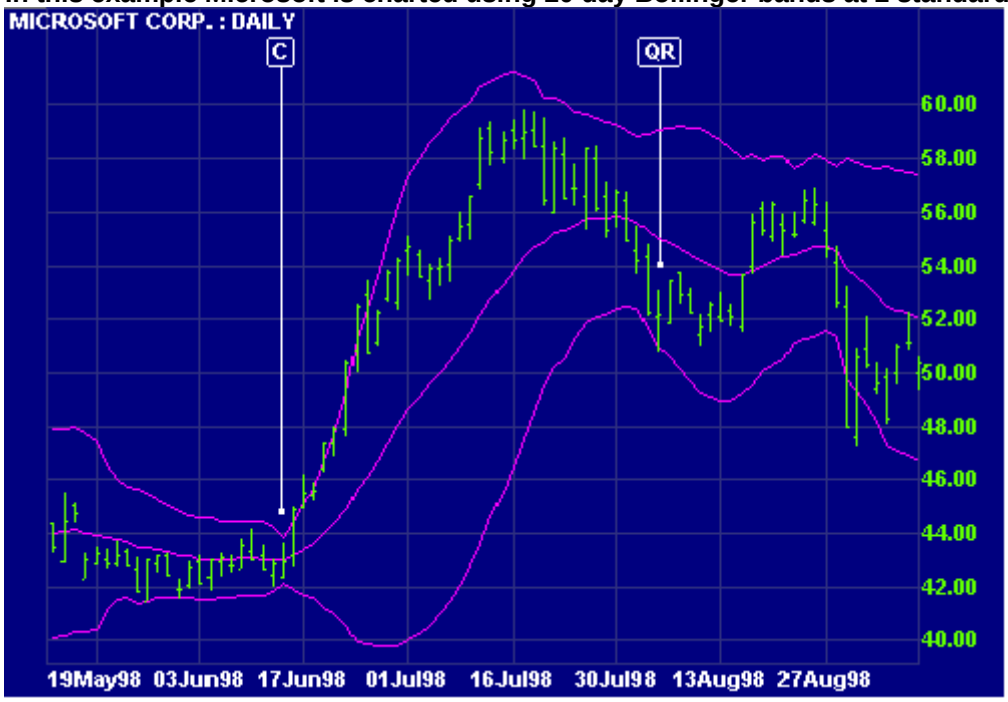
Bollinger Bands are useful for determining whether current values of a data field are behaving normally or breaking out in a new direction. For example, when the closing price of a security increases above its upper Bollinger Band, it will typically increase in that direction.

Bollinger Bands can also be used for identifying when trend reversals may occur. New highs or lows outside of the bands

followed by another high/low inside of the bands typically indicates a reversal in the current trend.

Since the standard deviation can be used as a volatility indicator, the current width of the envelope can also be used for trend information. A wide envelope indicates a high amount of volatility, while a narrow envelope indicates a lower amount. High volatility levels can sometimes be used to time trend reversals, such as market tops and bottoms. Low volatility levels can sometimes be used to time the beginning of new upward price trends following periods of consolidation.

Another observable trait of Bollinger Bands is that moves that begin at one band tend to go all the way to the other band. This can be useful for forecasting future values. Bollinger Bands are similar to Trading Bands and share many of their characteristics. However, unlike Bollinger Bands, Trading Bands do not vary in width based on volatility.
In this example Microsoft is charted using 20 day Bollinger bands at 2 standard deviations.



Contracting bands warn that the market is about to trend: the bands first converge into a narrow neck, followed by a sharp price movement. The first breakout is often a false move, preceding a strong trend in the opposite direction. A contracting range [C] is evident in June 1998: the bands converge to a width of $2, followed by a breakout in July to a new high.
A move that starts at one band normally carries through to the other, in a ranging market. A move outside the band indicates that the trend is strong and likely to continue - unless price quickly reverses. Note the quick reversal [QR] in early August. A trend that hugs one band signals that the trend is strong and likely to continue. Wait for divergence on a Momentum Indicator to signal the end of a trend.
In this example, 20 day Bollinger Bands at 2 standard deviations and 10 day Rate of Change.

Go short [S] - bearish divergence on ROC.
Contracting Bollinger Bands [C] warn of increased volatility. This begins with a false rally (note the ROC triple divergence) followed by a sharp fall.
Go long [L] - price hugs the lower band, followed by a bullish divergence on ROC.
Go short [S] - price hugs the upper band, followed by a bearish divergence on ROC.

RSI – Relative Strength Indicator
Developed by J. Welles Wilder and introduced in his book, New Concepts in Technical Trading Systems, the Relative Strength Index (RSI) is an extremely popular momentum oscillator. The RSI compares the magnitude of a stock's recent gains to the magnitude of its recent losses and turns that information into a number that ranges from 0 to 100. It takes a single parameter, the number of time periods to use in the calculation. Wilder recommends using 14 periods.
The RSI's full name is actually rather unfortunate as it is easily confused with other forms of Relative Strength analysis. Most other kinds of "Relative Strength" stuff involve using more than one stock in the calculation. Like most true indicators, the RSI only needs one stock to be computed. In order to avoid confusion, avoid using the RSI's full name and just call it "the RSI." To be used in conjunction with Bollinger Bands, the Relative Strength Indicator or index is based on a ratio of the average upward changes to the average downward changes over a given period of time. It has a range of 0 to 100 with values typically remaining between 30 and 70. Higher values indicate overbought conditions while lower values indicate oversold conditions.

The Relative Strength Index at the beginning of a data series is not defined until there are enough values to fill the given period. In addition, the value is defined as 100 when no downward changes occur during the given period. The Relative Strength Index (RSI) is typically used with a 9, 14, or 25 calendar day (7, 10, or 20 trading day) period against the closing price of a security or commodity. The more days that are included in the calculation, the less volatile the value.

The RSI usually leads the price by forming peaks and valleys before the price data, especially around the values of 30 and 70. In addition, when the RSI diverges from the price, the price will eventually correct to the direction of the index. The Relative Strength Index function determines the internal strength of a field using the number of upward and downward price changes over a given period of time. To simplify the formula, the RSI has been broken down into its basic components which are the Average Gain, the Average Loss, the First RS, and the subsequent Smoothed RS's.
For a 14-period RSI, the Average Gain equals the sum total all gains divided by 14. Even if there are only 5 gains (losses), the total of those 5 gains (losses) is divided by the total number of RSI periods in the calculation (14 in this case). The Average Loss is computed in a similar manner.
Calculation of the First RS value is straightforward: divide the Average Gain by the Average Loss. All subsequent RS calculations use the previous period's Average Gain and Average Loss for smoothing purposes.
When the Average Gain is greater than the Average Loss, the RSI rises because RS will be greater than 1. Conversely, when the average loss is greater than the average gain, the RSI declines because RS will be less than 1. The last part of the formula ensures that the indicator oscillates between 0 and 100.
Wilder recommended using 70 and 30 and overbought and oversold levels respectively. Generally, if the RSI rises above 30 it is considered bullish for the underlying stock. Conversely, if the RSI falls below 70, it is a bearish signal. Some

traders identify the long-term trend and then use extreme readings for entry points. If the long-term trend is bullish, then oversold readings could mark potential entry points.

Buy and sell signals can also be generated by looking for positive and negative divergences between the RSI and the underlying stock. For example, consider a falling stock whose RSI rises from a low point of (for example) 15 back up to say, 55. Because of how the RSI is constructed, the underlying stock will often reverse its direction soon after such a divergence. As in that example, divergences that occur after an overbought or oversold reading usually provide more reliable signals.

The centerline for RSI is 50. Readings above and below can give the indicator a bullish or bearish tilt. On the whole, a reading above 50 indicates that average gains are higher than average losses and a reading below 50 indicates that losses are winning the battle. Some traders look for a move above 50 to confirm bullish signals or a move below 50 to confirm bearish signals.