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Chart School

Bollinger Bands

Overview

Developed by John Bollinger, Bollinger Bands are an indicator that allows users to compare volatility and relative price levels over a period time. The indicator consists of three bands designed to encompass the majority of a security's price action.

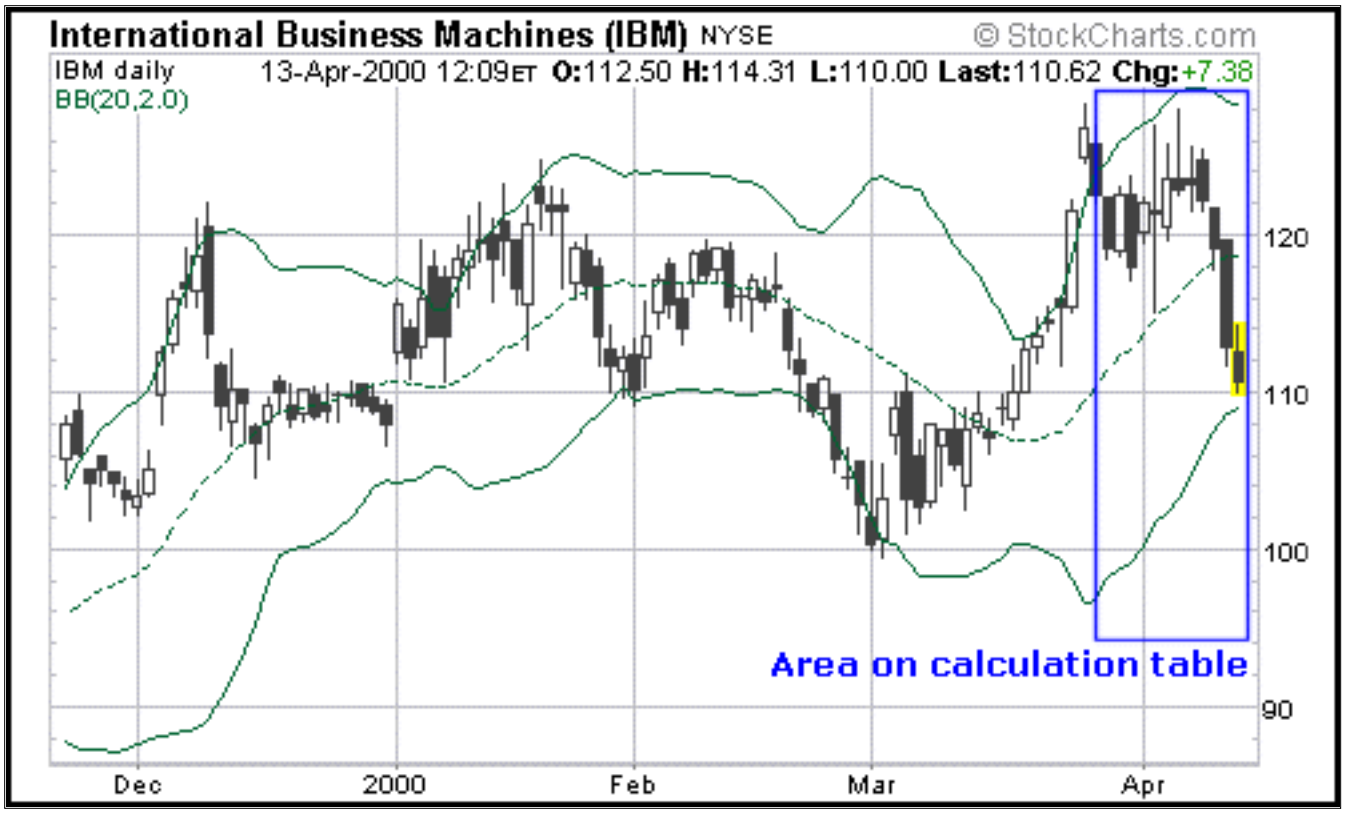
1. A simple moving average in the middle
2. An upper band (SMA plus 2 standard deviations)
3. A lower band (SMA minus 2 standard deviations)

Standard deviation is a statistical term that provides a good indication of volatility. Using the standard deviation ensures that the bands will react quickly to price movements and reflect periods of high and low volatility. Sharp price increases (or decreases), and hence volatility, will lead to a widening of the bands.

Formula

	Close	20-day SMA	StdDev	2 x StdDev	Upper Band	Middle Band	Lower Band
1	103.13						
2	109.00						
3	103.06						
4	102.75						
5	108.00						
6	107.56						
7	105.25						
8	107.69						
9	108.63						
10	107.00						
11	109.00						
12	110.00						
13	112.75						
14	113.50						
15	114.25						
16	115.25						
17	121.50						
18	126.88						
19	122.50						
20	119.00	111.33	6.64	13.29	124.62	111.33	98.05
21	122.50	112.30	6.79	13.57	125.88	112.30	98.73
22	118.00	112.75	6.85	13.70	126.46	112.75	99.05
23	122.00	113.70	6.75	13.51	127.21	113.70	100.19
24	121.19	114.62	6.45	12.90	127.52	114.62	101.73
25	123.63	115.40	6.54	13.09	128.49	115.40	102.31
26	122.75	116.16	6.47	12.94	129.11	116.16	103.22
27	123.13	117.06	6.13	12.26	129.31	117.06	104.80
28	122.13	117.78	5.82	11.65	129.43	117.78	106.13
29	119.00	118.30	5.44	10.87	129.17	118.30	107.43
30	112.69	118.58	4.97	9.93	128.51	118.58	108.65
31	110.63	118.66	4.82	9.64	128.30	118.66	109.03

IBM



(Click here to see a live example of Bollinger Bands)

The centerline is the 20-day simple moving average. The upper band is the 20-day simple moving average plus 2 standard deviations. The lower band is the 20-day simple moving average less 2 standard deviations.

Settings

Closing prices are most often used to compute Bollinger Bands. Other variations, including typical and weighted prices, can also be used.

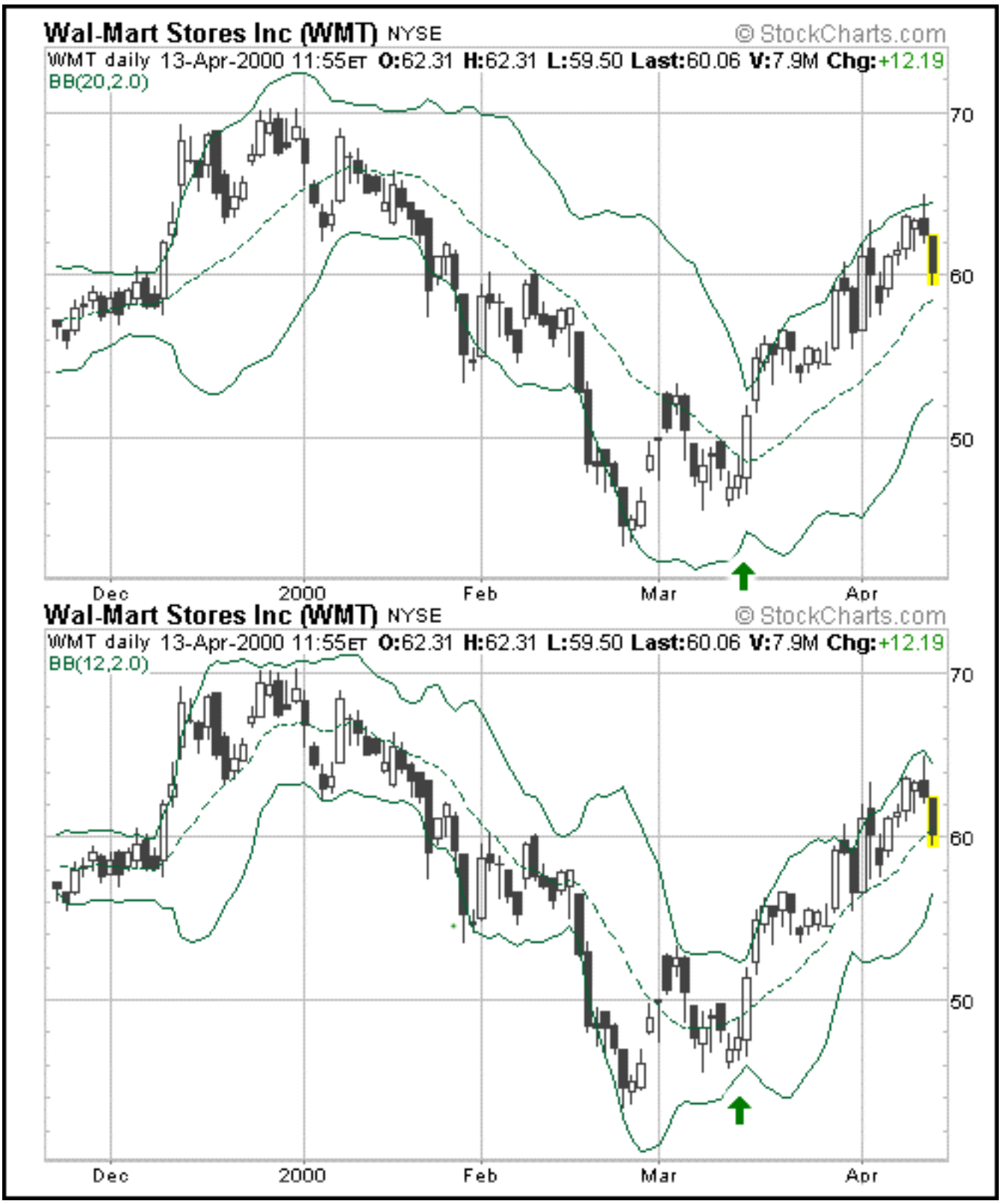
- Typical Price = (high + low + close)/3
- Weighted Price = (high + low + close + close)/4

Bollinger recommends using a 20-day simple moving average for the center band and 2 standard deviations for the outer bands. The length of the moving average and number of deviations can be adjusted to better suit individual preferences and specific characteristics of a security.

Trial and error is one method to determine an appropriate moving average length. A simple visual assessment can be used to determine the appropriate number of periods. 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.

Walmart



For WMT, a 20-period simple moving average proved to be a bit too long for the Bollinger Bands. Notice the wide gap between the lower band and the higher low in March. Through trial and error, a 12-period simple moving average appears to offer a better fit.

For general timeframes, Bollinger recommends a 10-day moving average for the short term, a 20-day moving average for the intermediate term and 50-day moving average for the long term.

Use

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: 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 band, or simple moving average.

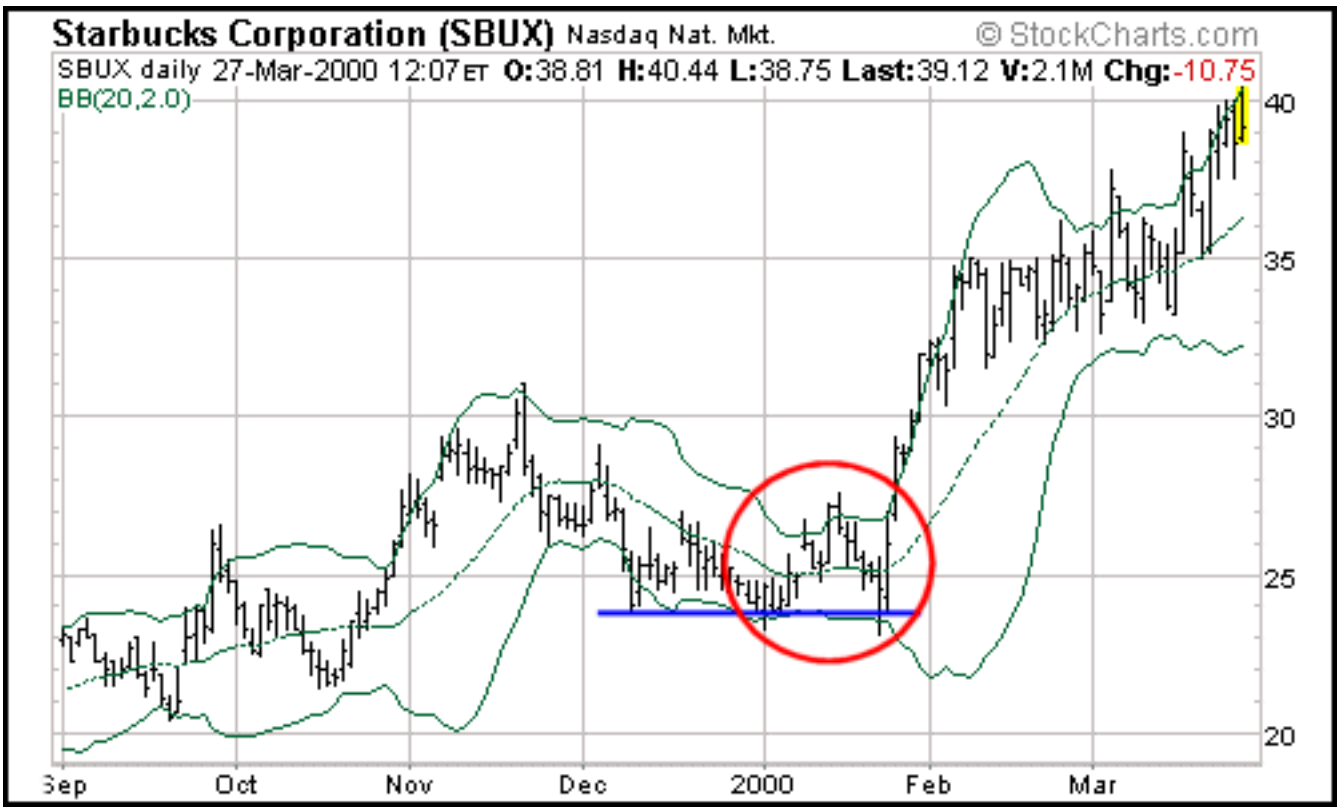
AT&T

T provides an example of a double bottom buy signal. The stock penetrated the lower band in late September (red arrow) and then held above on the subsequent test in October. The October breakout above the middle band (green circle) provided the bullish confirmation.

Double top sell: 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. Volatility can be important for options players because options prices will be cheaper when volatility is low.

Starbucks



SBUX provides an example of the bands tightening before a big move. In November, the bands were relatively wide and began to tighten over the next 2 months. By early January, the bands were the tightest in over 4 months (red circle). A little over a week later, the stock exploded for a 10+ point gain in less than 2 weeks.

Conclusions

Even though 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.

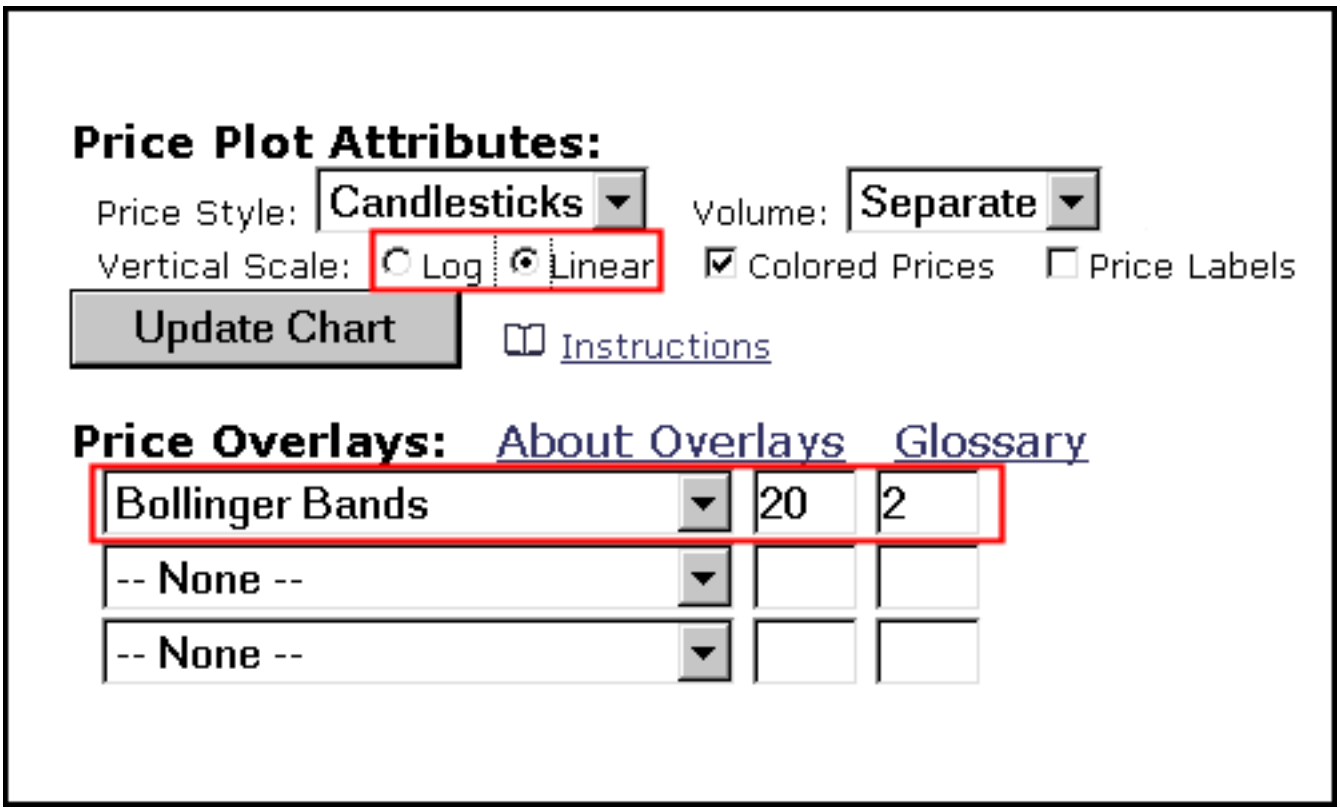
As stated above, securities can fluctuate between periods of high volatility and low volatility. Being able to identify a period of low volatility can serve as an alert to monitor the price action of a security. Other aspects of technical analysis, such as momentum, moving averages and retracements, can then be employed to help determine the direction of the potential breakout.

Remember that 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 or not prices are high or low on a relative basis can enhance our interpretation of other indicators and assist with timing issues in trading.

SharpChart Application

As a SharpChart indicator, Bollinger Bands can be found in the price overlays section. The first box sets the number of days for the simple moving average, which is the middle band. The second box sets the number of standard deviations above and below the simple moving average to set the upper and lower bands. The default setting is a 20-day simple moving average with the upper and lower bands set 2 standard deviations above and below. Both settings can be changed and users are encouraged to experiment.

Starbucks



Sometimes when using the log scale, the lower band will exceed the price scale and become cut off. To alleviate this, change the scale setting from "log" to "linear."

Written by Arthur Hill

Send us your Feedback!