NUS INVESTMENT SOCIETY

BOLLINGER BANDS

INTRODUCTION TO STOCHASTICS

INTRODUCTION

DEFINITION

- Bollinger Bands is a technical analysis tool developed by John Bollinger in the 1980s.

- It measures **price volatility** over time to determine whether the stocks or securities are over or undervalued.

- It consists of **3** lines – middle band/centerline, upper band, and lower band.

QUICK INTERPRETATION

- Prices are high in the upper band and low in the lower band.

- **Band width** refers to the distance between the upper and lower bands. It is used to signal trend reversals, breakouts, and other movements indicated by sharp price changes.

- The bands widen when the price volatility increases and narrow when volatility decreases.

BASIC CASE STUDY

CASE STUDY (BTC)

BITCOIN (SOURCE: TRADINGVIEW)

- **1ST RECTANGLE**

: WIDER BAND WIDTH

→ RELATIVELY HIGHER PRICE VOLATILITY

- **2ND RECTANGLE**

: PRICE BREAKS OUT OF THE UPPER BAND

→ POTENTIALLY OVERBOUGHT

→ SHORT OPPORTUNITY

SUMMARY OF SIMPLE STRATEGIES

Direction of the middle band

- The middle band indicates the strength of the trend.
- Heading upward: uptrend --> buy or hold a long position
- Heading downward: downtrend --> sell or hold a short position

The width of the bands

- The width reflects the market volatility.
- Narrow bands: less volatility & potential squeeze (imminent significant price move), and vice versa.

Price touching or moving outside

- Price touching or moving outside the upper band: potential overbought
  --> Selling or short opportunity
- Price touching or falling outside the lower band: potential oversold
  --> Buying opportunity

IN-DEPTH ANALYSIS

MATHEMATICAL CALCULATIONS

Bollinger Bands formula

- Middle Band = 20-day simple moving average (SMA)
- Upper Band = 20-day SMA + (20-day standard deviation of price x 2)
- Lower Band = 20-day SMA – (20-day standard deviation of price x 2)

Calculation of Bollinger Bands

$$\text{Bollinger Upper Band (BOLU)} = MA(TP, n) + m * \sigma[TP, n]$$
$$\text{Bollinger Lower Band (BOLD)} = MA(TP, n) - m * \sigma[TP, n]$$

MA = MOVING AVERAGE
TP= TYPICAL PRICE (HIGH+LOW+CLOSE) / 3
N = NUMBER OF DAYS IN MOVING AVERAGE (TYPICALLY 20)
M = NUMBER OF SD (TYPICALLY 2)

STOCHASTIC %B

%b is a form of stochastic that provides a normalised interpretation of Bollinger Band values. It indicates where the current price action is relative to the upper and the lower bands. As a real-time interpretation, it is used to generate trade signals.

__%b < 0__: The price is below the lower band

__%b = 0__: The price is exactly equal to the lower band

__0 < %b < 0.5__: The price is below the midline, but above the bottom band

__%b = 0.5__: The price is exactly the value of the midline value

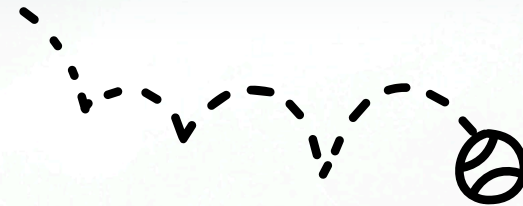*__0.5 < %b < 1.0__: The price is between the midline and upper band*

__%b = 1.0__: The price is exactly equal to the upper band value

__%b > 1.0__: The price is above the upper band

ADVANCED CASE STUDY

ADVANCED STRATEGIES

Bollinger Bounce
- Prices tend to return to the middle band.
- This is because if the price is seen as either overbought (upper band) or oversold (lower band), it will bounce in the opposite direction for correction.
- In a ranging market, traders may buy or sell based on the rebound from the upper or lower bands toward the middle band.

Finding price targets
- After a price bounces off the lower band, the upper band becomes a potential exit point if the price trend reverses and vice versa.

CONCLUSION

BENEFITS & LIMITATIONS

- Bollinger Bands highlights overbought or oversold conditions by measuring **volatility**, and identifying potential reversal points or trend continuations when prices move outside the bands.

- In low-volatility or sideways markets, Bollinger Bands can produce false signals, as prices frequently oscillate between the bands without clear direction.

- The bands rely on historical price data, so they might not accurately predict future market behaviour, particulary during sudden market shifts or breakouts.