

# Stock Technical Analysis with R

## Section 3: Stock Trading Signals

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# Stock Trading Signals

- **Stock trading signals** occur when there is a crossover among prices and technical indicators or between technical indicators and certain bands, centerlines or signals.
- These crossovers signal stock buying or selling opportunities and when it is overbought or oversold.
- They can either be applied **individually** or in **combination** with other stock trading signals.

# Single Indicator Trading Signals

- **Single indicator trading signals** are used to follow uptrends and downtrends or to lead price movement by identifying their momentum tendency of rising or falling prices to keep doing so.

# MA Trading Signals

- **Moving averages trading signals** occur when there is a crossover among stock close prices and their moving average or between short term and long term moving averages.
- **Price Crossover** Trading Signals:
  - Buy signal: Previous ( $\text{Close} < \text{SMA}_5$ )  $\rightarrow$  Current ( $\text{Close} > \text{SMA}_5$ )
  - Sell signal: Previous ( $\text{Close} > \text{SMA}_5$ )  $\rightarrow$  Current ( $\text{Close} < \text{SMA}_5$ )
- **Double Crossover** Trading Signals:
  - Buy signal: Previous ( $\text{EMA}_5 < \text{EMA}_{21}$ )  $\rightarrow$  Current ( $\text{EMA}_5 > \text{EMA}_{21}$ )
  - Sell signal: Previous ( $\text{EMA}_5 > \text{EMA}_{21}$ )  $\rightarrow$  Current ( $\text{EMA}_5 < \text{EMA}_{21}$ )

## BB Trading Signals

- **Bollinger bands trading signals** occur when there is a crossover among stock close prices and technical indicators' lower and upper bands.
- **Bands Crossover** Trading Signals:
  - Buy signal: Previous (Close < Lower Band) → Current (Close > Lower Band)
  - Sell signal: Previous (Close < Upper Band) → Current (Close > Upper Band)

# SAR Trading Signals

- **Parabolic stop and reverse trading signals** occur when there is a crossover among stock close prices and corresponding technical indicator.
- **Stop and Reverse** Trading Signals:
  - Buy signal: Previous (Close < SAR) → Current (Close > SAR)
  - Sell signal: Previous (Close > SAR) → Current (Close < SAR)

# ADX Trading Signals

- **Average directional movement index trading signals** occur when average directional movement index indicator is above an upper band and there is a crossover among positive and negative directional index indicators.
- **Band and Double Crossover** Trading Signals:
  - Stock trending:  $ADX(14) > +20$
  - Buy signal: Previous  $DI(14)p < DI(14)n \rightarrow$  Current  $DI(14)p > DI(14)n$  &  $ADX(14) > +20$
  - Sell signal: Previous  $DI(14)p > DI(14)n \rightarrow$  Current  $DI(14)p < DI(14)n$  &  $ADX(14) > +20$



# CCI Trading Signals

- **Commodity channel index trading signals** occur when there is a crossover among technical indicator and its upper and lower bands.
- **Bands Crossover Trading Signals:**
  - Buy signal: Previous  $(CCI(20,0.015) < -100) \rightarrow$  Current  $(CCI(20,0.015) > -100)$
  - Sell signal: Previous  $(CCI(20,0.015) < +100) \rightarrow$  Current  $(CCI(20,0.015) > +100)$

# MACD Trading Signals

- **Moving averages convergence/divergence trading signals** occur when there is a crossover among technical indicator and its signal or centerline.
- **Signal Crossover** Trading Signals:
  - Buy signal: Previous ( $\text{MACD}(12,26) < \text{Signal}(9)$ )  $\rightarrow$  Current ( $\text{MACD}(12,26) > \text{Signal}(9)$ )
  - Sell signal: Previous ( $\text{MACD}(12,26) > \text{Signal}(9)$ )  $\rightarrow$  Current ( $\text{MACD}(12,26) < \text{Signal}(9)$ )
- **Centerline Crossover** Trading Signals:
  - Buy signal: Previous ( $\text{MACD}(12,26) < 0$ )  $\rightarrow$  Current ( $\text{MACD}(12,26) > 0$ )
  - Sell signal: Previous ( $\text{MACD}(12,26) > 0$ )  $\rightarrow$  Current ( $\text{MACD}(12,26) < 0$ )

# ROC Trading Signals

- **Rate of change trading signals** occur when there is a crossover among technical indicator and its upper and lower bands.
- **Bands Crossover Trading Signals:**
  - Buy signal: Previous  $\text{ROC}(21) < -5$   $\rightarrow$  Current  $\text{ROC}(21) > -5$
  - Sell signal: Previous  $\text{ROC}(21) < +5$   $\rightarrow$  Current  $\text{ROC}(21) > +5$

# RSI Trading Signals

- **Relative strength index trading signals** occur when there is a crossover among technical indicator and its upper and lower bands.
- **Bands Crossover** Trading Signals:
  - Buy signal: Previous (RSI(14) < +30) → Current (RSI(14) > +30)
  - Sell signal: Previous (RSI(14) < +70) → Current (RSI(14) > +70)

# SMI Trading Signals

- **Stochastic momentum index trading signals** occur when there is a crossover among technical indicator and its signal.
- **Signal Crossover** Trading Signals:
  - Buy signal: Previous ( $SMI(13,2,25) < Signal(9)$ )  $\rightarrow$  Current ( $SMI(13,2,25) > Signal(9)$ )
  - Sell signal: Previous ( $SMI(13,2,25) > Signal(9)$ )  $\rightarrow$  Current ( $SMI(13,2,25) < Signal(9)$ )

## WPR Trading Signals

- **Williams %R trading signals** occur when there is a crossover among technical indicator and its upper and lower bands.
- **Bands Crossover Trading Signals:**
  - Buy signal : Previous (Williams %R(14) > +80) → Current (Williams %R(14) < +80)
  - Sell signal: Previous (Williams %R(14) > +20) → Current (Williams %R(14) < +20)

# Multiple Indicator Trading Signals

- **Multiple indicator trading signals** are used to follow uptrends or downtrends and confirm price movements by identifying their momentum tendency to keep on rising or falling.

## CCI and SMA Trading Signals

- **Commodity channel index and simple moving average trading signals** occur when there is a crossover among stock close prices and their simple moving average which is confirmed by commodity channel index being at an overbought or oversold area.
- **Price Crossover and Band Crossover Confirmation Trading Signals:**
  - Stock overbought:  $CCI(20,0.015) > +100$
  - Stock oversold:  $CCI(20,0.015) < -100$
  - Buy signal: Previous (Close  $< SMA_5$ )  $\rightarrow$  Current (Close  $> SMA_5$ ) &  $CCI(20,0.015) < -100$
  - Sell signal: Previous (Close  $> SMA_5$ )  $\rightarrow$  Current (Close  $< SMA_5$ ) &  $CCI(20,0.015) > +100$



## ROC and SMA Trading Signals

- **Rate of change and simple moving average trading signals** occur when there is a crossover among stock close prices and their simple moving average which is confirmed by rate of change indicator being at an overbought or oversold area.
- **Price Crossover and Band Crossover Confirmation Trading Signals:**
  - Stock overbought:  $ROC(21) > +5$
  - Stock oversold:  $ROC(21) < -5$
  - Buy signal: Previous (Close  $< SMA_5$ )  $\rightarrow$  Current (Close  $> SMA_5$ ) &  $ROC(21) < -5$
  - Sell signal: Previous (Close  $> SMA_5$ )  $\rightarrow$  Current (Close  $< SMA_5$ ) &  $ROC(21) > +5$

## RSI and SMA Trading Signals

- **Relative strength index and simple moving average trading signals** occur when there is a crossover among stock close prices and their simple moving average which is confirmed by relative strength index being at an overbought or oversold area.
- **Price Crossover and Band Crossover Confirmation Trading Signals:**
  - Stock overbought:  $RSI(14) > +70$
  - Stock oversold:  $RSI(14) < +30$
  - Buy signal: Previous (Close  $< SMA_5$ )  $\rightarrow$  Current (Close  $> SMA_5$ ) &  $RSI(14) < +30$
  - Sell signal: Previous (Close  $> SMA_5$ )  $\rightarrow$  Current (Close  $< SMA_5$ ) &  $RSI(14) > +70$

## SMI and SMA Trading Signals

- **Stochastic momentum index and simple moving average trading signals** occur when there is a crossover among stock close prices and their simple moving average which is confirmed by stochastic momentum index indicator being at an overbought or oversold area.
- **Price Crossover and Band Crossover Confirmation Trading Signals:**
  - Stock overbought:  $SMI(13,2,25) > +40$
  - Stock oversold:  $SMI(13,2,25) < -40$
  - Buy signal: Previous (Close  $< SMA_5$ )  $\rightarrow$  Current (Close  $> SMA_5$ ) &  $SMI(13,2,25) < -40$
  - Sell signal: Previous (Close  $> SMA_5$ )  $\rightarrow$  Current (Close  $< SMA_5$ ) &  $SMI(13,2,25) > +40$

## WPR and SMA Trading Signals

- **Williams %R and simple moving average trading signals** occur when there is a crossover among stock close prices and their simple moving average which is confirmed by Williams %R indicator being at an overbought or oversold area.
- **Price Crossover and Band Crossover Confirmation Trading Signals:**
  - Stock overbought: Williams %R(14) < +20
  - Stock oversold: Williams %R(14) > +80
  - Buy signal: Previous (Close < SMA<sub>5</sub>) → Current (Close > SMA<sub>5</sub>) & Williams %R(14) > +80
  - Sell signal: Previous (Close > SMA<sub>5</sub>) → Current (Close < SMA<sub>5</sub>) & Williams %R(14) < +20