

## **RELATIVE STRENGTH INDEX (RSI)**

RSI is a price following oscillator, whose value oscillates between 0-100 and calculated based on relative strength. It is a measure of momentum. An N-period relative strength is the ratio of gains in the price in last N days, divided by the losses in last N days.

### **Calculations:**

Relative Strength Index is calculated in the following manner:

#### **1. Gains and losses are calculated as**

$$\begin{aligned} & \text{If } \text{Close}(\text{Today}) > \text{Close}(\text{Previous day}) \\ & \text{Gain} = \text{Close}(\text{Today}) - \text{Close}(\text{Previous day}), \text{Loss} = 0 \\ & \text{Otherwise,} \\ & \text{Gain} = 0, \text{Loss} = \text{Close}(\text{Previous day}) - \text{Close}(\text{Today}) \end{aligned}$$

#### **2. Average gain and average loss are calculated as**

$$\begin{aligned} \text{Initial average gain (or loss)} &= \frac{\text{Total of gains (or losses) during the last } N \text{ periods}}{N} \\ \text{Average gain (or loss)} &= \frac{\text{Previous average gain (or loss)} \times (N - 1) + \text{current gain (or loss)}}{N} \end{aligned}$$

#### **3. Relative Strength, RS for the last N days is calculated as**

$$\text{Relative Strength, } RS(N) = \frac{\text{Average gain in last } N \text{ days}}{\text{Average losses in last } N \text{ days}}$$

#### **4. Finally, Relative Strength Index is calculated as**

$$\text{Relative Strength Index, } RSI(N) = 100 - \frac{100}{1 + RS(N)}$$

### **When to use...**

When RSI crosses above the level of 50 it is a bullish signal and vice versa, when RSI crosses above 70 in uptrend it can stay there for extended period and When RSI crosses below 30 negative momentum gets stronger. Higher values of RSI indicate overbought market; whereas low values indicate oversold market. 30 and 70 are usually set as thresholds for a buy and sell signal respectively. Buy/Sell signals are also generated by observing divergence between security and indicator (A divergence is said to exist if the price and the indicator moves in opposite direction). Underlying security usually reverses the direction and follows the direction of the indicator.