Oscillator

A technical analysis tool.

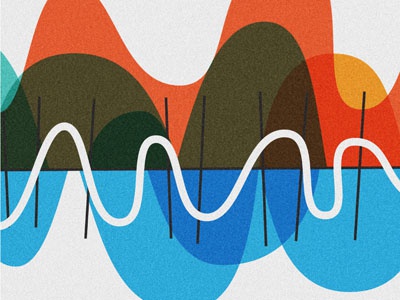


Figure 1: Sinusoidal design, [source](https://www.google.com/url?sa=i&url=https%3A%2F%2Fdribbble.com%2Ftags%2Fsinusoidal&psig=AOvVaw1hVgJi_mp9EA31GG8iqxML&ust=1640810751482000&source=images&cd=vfe&ved=0CAsQjRxqFwoTCPiK_Mauh_UCFQAAAAAdAAAAABAE).

This document is intending to make a review of main oscillators technical analysis tools.

# Oscillators

* An oscillator is a momentum indicator used as a technical analysis tool that constructs high and low bands between two extreme values, 100 and 0, then builds a trend indicator that fluctuates within these bounds.
* Traders use the trend indicator to discover short-term overbought or oversold conditions.
* Combine with other indicator, like moving average indicator, it provides opportunity.
* Overbought, indicator > 70: bearish signal, opportunity to sell.
* Oversold, indicator < 30: bullish signal, opportunity to buy.
* when a price breakout occurs, the signals may be misleading: either the resetting of the range by which the current sideways market is bound or the beginning of a new trend.
* During the price breakout, the oscillator may remain in the overbought or oversold range for an extended period of time.
* Technical analysts consider oscillators better suited for sideways markets.



Figure b: Sideway market.

# Stochastic Oscillator

* In technical analysis of securities trading, the stochastic oscillator is a momentum indicator that uses support and resistance levels.
* Stochastic refers to the property of being well described by a random probability distribution.
* The term stochastic refers to the point of a current price in relation to its price range over a period of time.

## Calculation





* %D is the N-day moving average (or exponential moving average when the volatility is high) of %K (the last N values of %K).
* Price is the last closing price
* is the lowest price over the last N periods
* is the highest price over the last N periods

## Interpretation

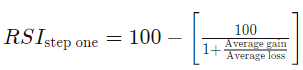
* Stochastics attempts to predict turning points by comparing the closing price of a security to its price range.
* Prices tend to close near the extremes of the recent range just before turning points.
* An alert or set-up is present when the %K line cross the %D line.

# Relative Strength Index (RSI)

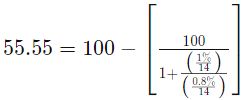
* RSI is a momentum indicator used in technical analysis that measures the magnitude of recent price changes to evaluate overbought or oversold conditions.
* Used for long/middle term.

### Formula

* The average gain or loss used in the calculation is the average percentage gain or loss during a look-back period, usually 14 days.



* Example: 7 days with an average gain of 1% and 7 days with an average loss of -0.8%. The calculation would be:

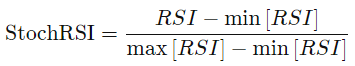


* The indicator can stay in the overbought region for extended periods while the stock is in an uptrend. The indicator may also remain in oversold territory for a long time when the asset is in a downtrend.
* During a long uptrend an oversold reading on the RSI is likely much higher than 30%.
* During a long downtrend an overbuy reading on the RSI during is much lower than the 70% level.

# Stochastic RSI – StochRSI

* The Stochastic RSI (StochRSI) is an indicator used in technical analysis that gives traders an idea of whether the current RSI value is overbought or oversold.
* StochRSI is created by applying the Stochastic oscillator formula to a set of relative strength index (RSI) values.
* Overbought doesn't necessarily mean the price will reverse lower, just like oversold doesn't mean the price will reverse higher. Rather the overbought and oversold conditions simply alert traders that the RSI is near the extremes of its recent readings.
* That’s why it is used for short term compared to RSI.
* A reading of zero means the RSI is at its lowest level in 14 periods.
* A reading of 100 means the RSI is at the highest level in the last 14 periods.

### Calculation



* RSI is the current RSI.
* min [RSI] is the lowest RSI over the period.
* max [RSI] is the lowest RSI over the period.

### Difference between StochRSI and RSI

* They seem similar, but the StochRSI relies on a different formula from what generates RSI values.
* One of the key differences: StochRSI moves very quickly from overbought to oversold, or vice versa, while the RSI is a much slower moving indicator.
* One isn't better than the other.



Figure c: Difference between price, RSI and StochRSI.