What is the MACD?

The MACD, or Moving Average Convergence/Divergence is widely used technical analysis study. It is effectively a hybrid indicator, which comprises both elements of momentum and moving average analysis.

The indicator uses two exponential moving averages, which help to measure momentum in the price. The MACD Line is simply the difference between these two moving averages plotted against a centre line. The centre line is the point at which the two moving averages are equal. Along with the MACD and the centre line, an exponential moving average of the MACD itself is plotted on the chart to produce the Signal Line. The idea behind this momentum indicator is to measure short-term momentum compared to longer term momentum to help signal the current direction of momentum.

Calculation of the MACD Line and Signal Line

The most common moving average values used in the calculation of the MACD Line are the 26 period and 12 period exponential moving averages. The Signal Line is commonly created by using a 9 period exponential moving average of the MACD values. These values can be adjusted to meet the needs of the technician and the instrument. For more volatile instruments, shorter term moving averages are used while less volatile securities should have longer moving averages. Once more the MACD is an effective analysis tool across a number of different time frames.

MACD Histograms

Another aspect to the MACD indicator that is often found on charts is the MACD histogram (or Forest as some software programmes will refer to it). The histogram is plotted on the centre line and represented by bars.

Each bar is the difference between the MACD and the Signal line (in most cases the 9 period exponential moving average). The higher the bars are in either direction, the greater the distance between the MACD and the Signal lines which implies more momentum behind the direction in which the bars point.
Reading the MACD and Signal Lines

When the MACD Line is positive (above the zero neutral line) it signals that the shorter term moving average (i.e. on a daily chart, the 12 day exponential moving average) is above the longer term moving average (i.e. the 26 day exponential moving average). With the nearer term average price higher than the longer term average price, this suggests that the price momentum has been getting stronger. Therefore, a positive MACD suggests the current price has upward momentum.

When the MACD is negative (below the zero line) this signals that the shorter term is below the longer, which suggests that he current price has downside momentum.

The MACD line will cross over the centre line, as the two moving averages cross over. This would suggest that the MACD lines can be used to signal bullish or bearish trends depending upon their configuration.

In Figure 1, during mid-July 2013, the MACD and Signal lines are rising but are still below the zero line, which can just mean that a bear market recovery is underway. However, as the trend strengthens, the shorter moving average has now crossed above the longer moving average. This now implies a strengthening outlook, which is shown by the MACD line passing into positive territory (above zero). Once the Signal line has also moved into positive territory, the trend is now considered to be bullish.

Crossovers and Kisses Using the Signal Line and the MACD Histogram

The Signal Line is used to generate trading signals. Being an exponential moving average of the MACD Line, the Signal Line will lag the MACD. However, when the MACD line begins to move back towards the Signal Line then we begin to get some trading signals such as a Crossover or a Kiss.

When the MACD Line crosses over the lagging Signal Line this is indication of a reversal. However, if the two lines just come together and “kiss” before moving back in the same direction, this can also be a powerful continuation signal.

It is also beneficial to watch the MACD Histogram, as the histogram can give early warning signals of a trend maturity. The histogram moving through the zero line depicts the crossover of MACD and the Signal lines. Furthermore is there is a divergence on the MACD Histogram with the price this can be an even stronger warning.
Divergences

Technical analysts would look for divergences with either the lines or the histogram to indicate a slowing of the strength of the trend (in either direction). This would subsequently be an early indication of a change in the direction of the trend.

Here in Figure 3, the MACD lines are consistently making lower highs, whilst the MACD Histogram is also doing the same. The big warning signal comes with the highs in late November and early December where the MACD histogram fluctuates around the zero line. When the MACD line (red) falls sharply away below zero this is confirmation that the trend was reversing.
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