
Investment basics XXIV – Technical analyses part 2

Moving Averages and Momentum Oscillators

Introduction

The first article in this series defined technical analysis as the use of historical data on prices, and volumes where available, to forecast the future behaviour of the price.

Over the years a number of methods have been developed to assist an investor in making profitable decisions. One key objective has been to find an indicator that could reveal the direction of the ruling trend in a market. A change in trend would signal an opportunity to buy or sell. Ideally, these signals would be unambiguous and would not lag far behind the actual change in the trend of the price.

The Moving Average

A chart of any price is full of up and down spikes – sharp changes in the trend with a short duration – that obscure the sought after underlying trend. The moving average is designed to reveal the true trend by reducing the effects of this noise.

A number of methods can be employed for the calculation of a moving average. The simple arithmetical average has fallen out of favour because other methods require less computation. A factor common to all methods is that the average is not charted at the centre of the interval for which it is calculated, but at the most recent period. This practice improves the visual comparison of the current values of the price and average from which the signals are generated.

There are three strategies for using moving averages:

Firstly, the moving average itself can be used to indicate the direction of the trend. When the average turns up it would signal a buy. When it turns down, a sell signal is generated. This method was useful when people used to do calculations manually, so that reversal points in the average were easy to identify.

Secondly, the moving average and price can be combined to generate a buy signal whenever the price breaks through from below to above the average. A sell signal would result when the price breaks down through the moving average. The rationale is that a moving average will always lag behind the price while it maintains a firm trend. A reversal in the trend will only be confirmed once the price is able to penetrate beyond the average. The amount of lag is determined by the period of the average, so that the sensitivity of the indicator and its ability to filter out noise can be adjusted.

A trade off is necessary between the amount of lag from the time of the actual reversal in the trend to the time of the signal, and the incidence of false signals. The latter arise when a signal has been triggered by noise, yet the original trend resumes soon thereafter.

This indicates the third strategy. The trade off can be improved if two averages are used according to the above strategy, rather than the price and an average. A signal is generated when the two charts cross. The nature of the signal is determined by the direction of the average of the shorter period.

The Momentum Oscillator

A momentum chart of the price is equivalent to the rate of change of the price. If the price chart is noisy, the momentum chart will also be noisy. Therefore many analysts prefer to use a momentum of a moving average of the price.

Mathematically, a price curve reaches a maximum or minimum when the rate of change is zero. An increase in the price is

associated with a positive rate of change. The latter will reach a maximum when the price is rising most steeply. Similarly, a fall in price results in a negative rate of change, or negative momentum, while the lowest rate of change corresponds to the steepest decline in price.

A momentum chart therefore oscillates above and below the zero base line, crossing that base line when the price reaches its maxima and minima. These points would ideally be the times to buy and sell.

In practice, the methods used to reduce the effects of noise introduce delays in the momentum oscillator. The points where it crosses the base line lag behind the actual reversal points of the price. A strategy has been devised to use the delay to advantage. Instead of waiting until the momentum crosses the base line, a warning signal is generated as soon as the momentum has reversed direction at the extreme distance from the base line. It is assumed that the price, too, will soon reach its maximum or minimum, and reverse direction. Essentially, this is the concept behind the overbought and oversold indicator.

Conclusions

Moving averages and momentum oscillators can be described as 'event driven' indicators. The generation of the signal only requires the arithmetical values used for the indicator for the two most recent periods. This is sufficient to show whether a cross over had taken place.

Event driven indicators are very useful for computerised scanning of shares, according to predefined criteria, to select those shares which have generated buy or sell signals. These indicators are easy to program, but they always suffer from the need to find a balance between reaction time and the incidence of false signals.

Many new kinds of oscillators have been devised. Exhaustive tests on historical data often reveal that a particular combination have performed well in the past. However, when tested live, results have never been fully up to expectations, nor have they been consistent over a length of time.

Other approaches to technical analysis were based on patterns, and signals were generated through pattern recognition. Despite being less objective and less definite than event driven methods, pattern based methods correctly recognise that the market is complex; it is not really amenable to analysis by a one dimensional indicator.

The next article will examine a well known pattern based indicator.