

# Oscillators Go with the Flow

## Analysis using Momentum Indicators

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*A previous article in the Alchemist series on technical analysis looked at moving averages as a method of defining trend. But what of non-trending markets? There are a number of technical tools that are available to analyse price action within trading ranges. These are generally grouped under the heading "Oscillators".*

Oscillators assume a cyclical rhythm to market action and measure the amount that price has changed over time. Momentum is often used as a generic term for this relative performance.

Price action is a measure of the emotional intensity of the crowd and fluctuates between periods of optimism and pessimism, and

techniques using oscillators can give clues as to when this emotion is at extremes. As with many other technical-analysis techniques, the use of oscillators must be subordinated to basic trend analysis, as they can give misleading signals at the start of trend moves. However, markets generally spend more time in range phases than in trends, making these indicators a useful analytical tool.

A moving-average system that performs well in a trending market will fail within a range – its lagging nature will lead to a delay in buy and sell signals and a whipsawing of positions. An oscillator measures acceleration or deceleration in a price advance or decline and will help to find turning points on a leading or coincident basis. As a measure, acceleration is more sensitive than the speed of a move which, in turn, is more sensitive than the price.

### And the Oscillators Are...

Some oscillators, such as the Relative Strength Index (RSI) and stochastic are normalised to fluctuate between set boundaries; others, such as Rate of Change and Moving Average Convergence Divergence (MACD) have no upper or lower boundaries. When an oscillator

is at its upper extremes or at a historic high, the market is said to be overbought; when at the lower extremes or a historic low, then it is oversold.

The overbought/oversold boundaries should ideally be adjusted to encompass around 95% of the price action but, practically, they are usually set according to the time period of the oscillator.

Oscillators can be used within a consolidation pattern to position for the next trend move. Buy when the oscillator is oversold in a longer term bull trend and sell short when the oscillator is overbought in a longer term bear trend. Oscillators are at their least reliable when markets are at range extremes prior to a breakout and new trend.

Trend-line breaks of the oscillator can give important signals and usually occur prior to trend-line breaks of the underlying price chart, giving a lead on sentiment changes. Traditional continuation and reversal patterns, such as "head-and-shoulders", can also be identified on oscillator charts. As with price analysis, one should look at oscillators over different time spans to gauge short-, medium- and long-term market momentum.

### Divergence

An important pattern to watch for is that of divergence, which occurs when the oscillator fails to confirm a move to a new price high or low. This warns of a weakening of the trend structure, but the signal should be confirmed with a trend line break or completion of another technical reversal pattern. Three types of divergence are recognised, with declining levels of significance:



- A) Price at new high, oscillator at lower high (bearish). Price at new low, oscillator at higher low (bullish)
- B) Prices at double top, oscillator at lower top (bearish). Prices at double bottom, oscillator at higher low (bullish)
- C) Prices at new high, oscillator at double top (bearish). Prices at new low, oscillator at double bottom (bullish).

The most basic of momentum indicators measure the difference in price of the most recent close from a point X periods earlier. When expressed as a ratio, this is normally referred to as rate of change. However, there are problems with this measure, which stem from the volatility of the resulting indicator and the lack of an upper and lower limit to determine extremes.

Following are other commonly used momentum indicators.

**Relative Strength Index (RSI)**

The RSI measures the relative internal strength of a market against its own previous price action. It is based on the difference between the average of the closing prices on up days versus the average of the closing prices on down days over a given period of time. By using more values in the calculation period, the distortions and volatility of a Rate of Change indicator will be smoothed out.

The formula keeps the oscillator bounded at 0 and 100, with oversold/overbought levels usually set at 30 and 70 for the default 14-day indicator and 20 and 80 for the shorter 9-day. The shorter the time period used, the more sensitive the oscillator and the greater the wave amplitude.

The formula is:

$$100 - \left( \frac{100}{1 + RS} \right)$$

where RS is the 14-day average of up price closes divided by the 14-day average of down price closes.

**Stochastic Oscillator**

Stochastic is based on the principal that, within a period of strength, a market will close towards the upper bounds of the range, whereas in a down-trending market, the price will close near the bottom of the range. The most recent close is compared to the price range over a given time period.

The stochastic oscillator plots two lines, %K and %D, which fluctuate between 0 and 100.

There are two types of stochastic: fast and slow. When calculating fast,

$$\%K = \left( \frac{\text{close} - \text{lowx}}{\text{highx} - \text{lowx}} \right) \times 100$$

where lowx is the low of the past x periods, and highx is the high of the past x periods. The original default period was five days, but longer periods (up to 20 days) are also commonly used. %D = 3-day moving average of %K.

The slow stochastic is often preferred, as it smooths the volatility of the fast indicator. When calculating slow, fast %K is dropped and fast %D becomes the new slow %K. The slow %D is then the 3-day moving average of the slow %K.

Overbought/oversold extremes can range between 70 and 90 on the upside and 10 to 30 on the downside, depending on the time period used. As with RSI, greater extremes are likely with a shorter-term indicator.

A few basic rules in a non-trending market would be to buy when %K or %D falls below

20 and then rises back above that level, or to buy when the %K line rises above the %D line. Sell when %K or %D rises above 80, then reverses below, or sell when %K falls below %D. Ordinarily %K will change direction first, but if %D is the first to turn, the change in direction is likely to be slower and more stable.

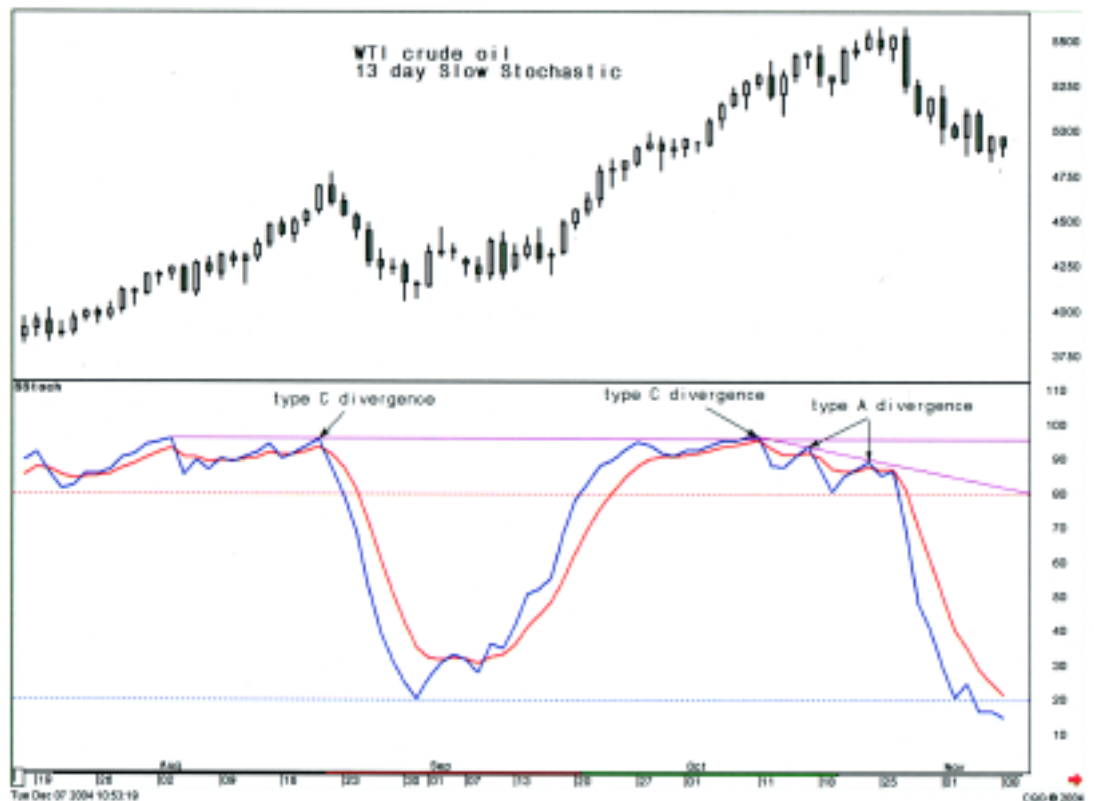
A hinge is the term used for a reduction in speed of the indicator.

**MACD: Moving Average Convergence and Divergence**

The MACD measures the difference between two exponential moving averages (EMA), a fast and a slow (defaulted to 12- and 26-day). The name derives from the tendency of the fast EMA to move towards and away from the slow EMA.

The system is most effective in widely swinging markets. A signal line or trigger is plotted as a 9-day EMA of the base MACD. A trading signal is given when the base MACD falls below or rises above its trigger line. Unlike RSI and stochastic, this oscillator is unbounded, so overbought/oversold levels need to be set individually for each market by looking at historical extremes. As with other oscillators, divergences are a potentially strong reversal signal.

A histogram can be plotted as the difference between the MACD and the signal line to show acceleration/deceleration of the trend. ■





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