# Using Stochastics to Forecast Market Moves

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The stochastic is one of the most popular major technical indicators used to study price movements. Supply and demand factors exert their influence on the market through price changes which are subsequently analyzed in the science of technical analysis. The stochastic indicator not only helps to identify when to exit an existing position in a market but also can be used to monitor other indicators for entries. One of its key advantages, however, is its ability to estimate the extent of market moves. This article focuses on the use of the stochastic for estimating market moves.

## Stochastics: The Basics

The stochastic is based on the observation that as price highs and lows are reached, closing prices tend to accumulate increasingly closer to the high or low price for that period of time. Essentially this indicator expresses the position of the close relative to the high-low range of the market. Based on this technical theory, closes (or in the case of intra-day bars, last trades) tend to cluster around the highs before a downturn and around the lows before an upturn, therefore helping to identify when a market is in an "overbought" or "oversold" condition.

Two versions of the stochastic, regular and slow, are commonly used. The examples below employ the slow stochastic, which is smoother and less erratic than the regular stochastic.

The regular stochastic consists of two lines, %K and %D, where:

$$\%K = ((Ct-Ln)/(Hn-Ln))*100$$

Ct = this close
Ln = low over n periods
Hn = high over n periods

and D% is a moving average, either normal or an exponential of %K.

The slow stochastic is similar except that it uses %D in place of %K and a double smoothed %D ( again either a normal or an exponential) in place of %D.

The "n" in the equation, should be roughly equivalent to one half the predominant cycle length of the market, which represents on average the time between the market highs and lows. The distance between a low and a high price and down to a low is considered one cycle. It is best to err on the side of larger rather than smaller values. For highest accuracy, cycle lengths, can be determined by running a fast Fourier transform, a higher mathematical function which solves for the major market cycle length, and will show graphically the three or four predominant cycles. This algorithm can be found in Computrac, a commodity charting service, or within statistical analysis packages.

Another alternative is to use either a mechanical or electronic cycle finder. (The Erlich Cycle Finder Co. offers a mechanical finder. Some charting services, such as CQG, have electronic finders.) These simply divide a chart into equal sections. Then the trader must decide when the sections fit. Cycles can also be found by eye, and length by counting the number of bars.

Finally, predominant market cycles tend to cluster around the same values. Therefore, hand calculated values which are consistent with historical patterns represent the most simple alternative.

## Watch for Two Formations

There are two stochastic formations helpful in estimating market moves. The "double bottom retracement" predicts when prices will retrace about 50 percent to its original peak, and the "double money breakthrough" projects when the market will double its move.

These estimates can be used two ways. First, signals on longer term charts can be used to identity trade opportunities in shorter time frames. For example, a signal that a 50 percent retracement is imminent on a 60 minute chart may lead a trader to look for entry signals in the same direction on a 15 minute chart.

Secondly, when the market trades to roughly 10 percent of target levels, close profit-taking stops are justified. If a 90 cent move is projected, a close trailing stop ( an order to buy or sell at a specific price) is placed once the market trades within 9 or 10 cents of target.

## Double Bottom Retracement

The double bottom retracement is signalled when the %D reaches an extreme level (close to 100% on the upside and close to 0% on the downside), makes a small move away, goes back to within a few percentage points of the first extreme, then turns. A 50 percent retracement can then be expected.

The retracement amount can be found by dividing by two the difference between the recent high and low price. In an upward retracement, this value is added to the low. In a downward retracement, it is subtracted from the high.

Figure 1 shows the 54 minute April light sweet crude oil contract . On Tuesday, February 5, 1991 the %D reached 5 percent, bounced, went down to 5 percent again and turned up. The market traded as high as $21.30 the morning of January 30, and as low on that Tuesday of $19.70. A 50 percent retracement then would bring the market back to about $20.50. In fact, the market traded up to $20.65 on February 7, 1991 and then turned back down.

## Double Money Breakthrough

The "double money breakthrough" occurs when both stochastic lines move from under 25 percent and "breakthrough" to over 75 percent or vice versa, in a direction consistent with the overall direction of the market. At this point the market move is expected to double and shoot for a target an equal amount further than the move from 25 percent to 75 percent. To calculate the target, take the closing prices corresponding to stochastic lines crossing 25 percent and 75 percent. Take the difference and add it to the 75 percent close for an upmove or subtract it from the 25 percent close for a downmove. When it is hard to decide which bar's close to use (for example when the %D goes from 15 percent to 35 percent in one period), extrapolation between closes is the best solution.
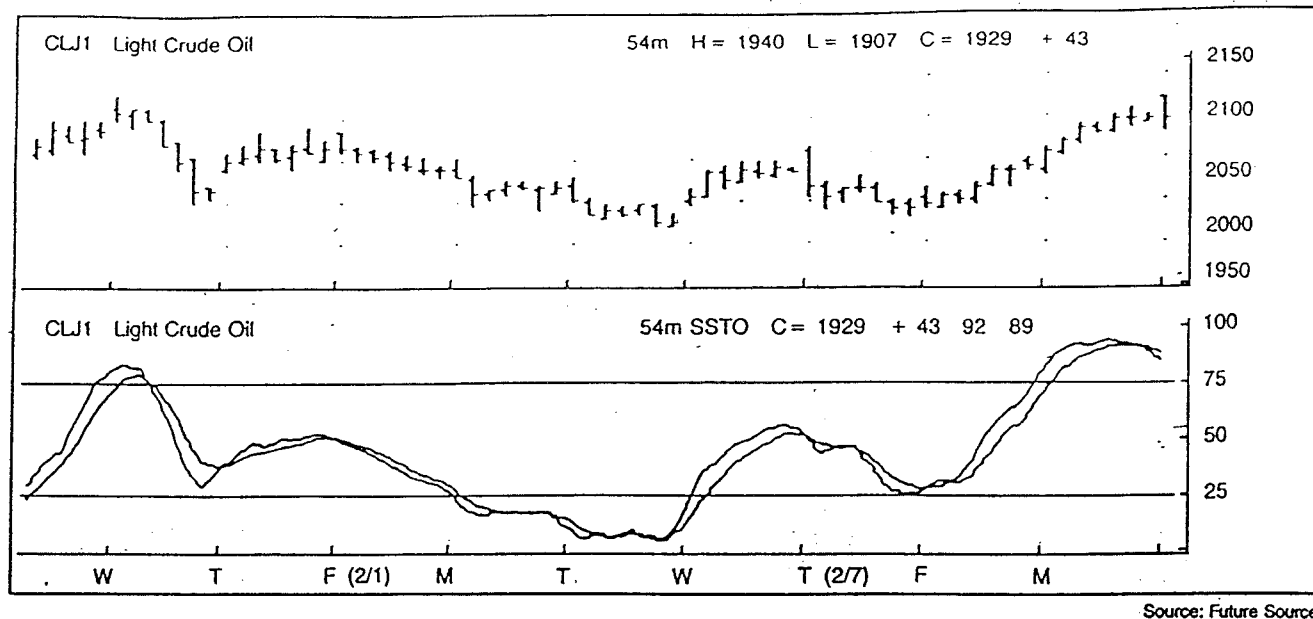
Figure 1



CLJ1   Light Crude Oil          54m   H = 1940   L = 1907   C = 1929   + 43

CLJ1   Light Crude Oil          54m SSTO   C = 1929   + 43   92   89

W   T   F (2/1)   M   T.   W   T (2/7)   F   M

Source: Future Source

Figure 2



CLJ1   Light Crude Oil          54m   H = 1940   L = 1907   C = 1933   + 47

CLJ1   Light Crude Oil          54m SSTO   C = 1933   + 47   91   85

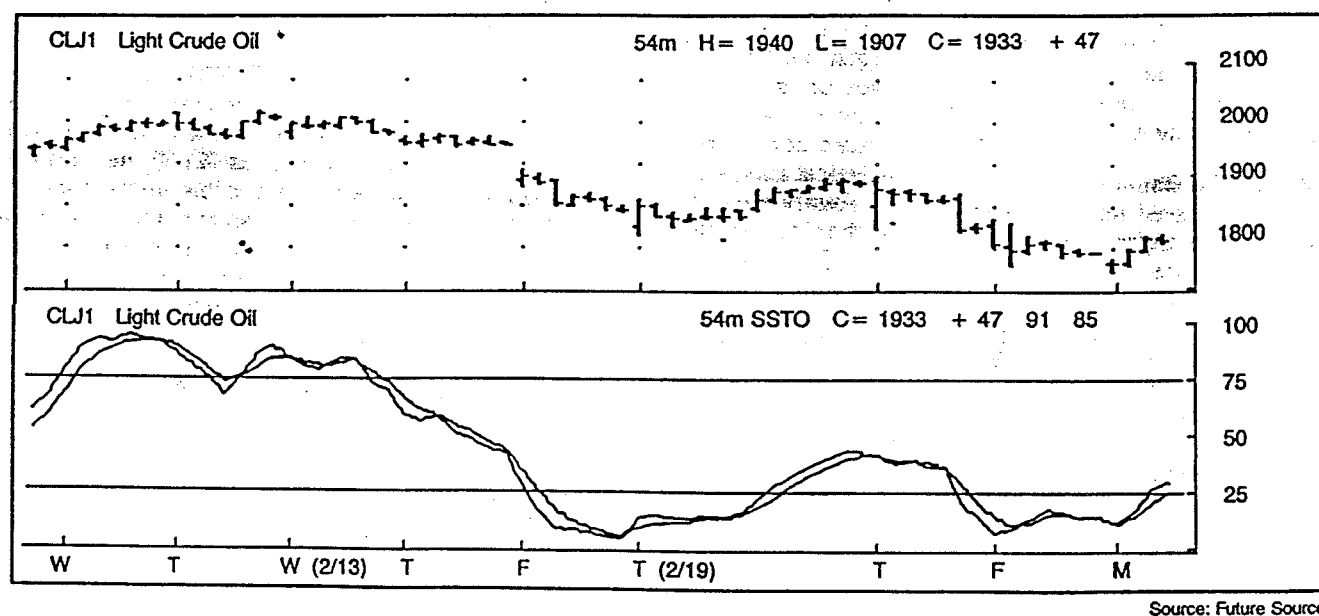W   T   W (2/13)   T   F   T (2/19)   T   F   M

Source: Future Source

Figure 2 shows the 54 minute NYMEX April light sweet crude oil market. On February 13, the stochastic broke 75% at a level of about $20.75 and on the 15th fell below 25% to about $19.57, a $1.18 difference. Subtracting $1.18 from $19.57 gives an estimated further downmove to $18.39. The market actually traded down to $18.30 on February 19, 1991 before bouncing back up.

**Summary**

The stochastic can be a very useful indicator when employed properly. By watching the direction and strength of price movements, a firm can determine important buy or sell signals which will ensure efficient trading of energy markets.   ✪

Cynthia Kase spent the first 10 years of her career as an engineer. After having joined Chevron in that capacity, she was transferred in 1983 into the firm's international trading group. In 1985 she came to New York as area manager for clean products, responsible for trading in the eastern half of this hemisphere and Atlantic Basin. In early 1990 she joined Chemical Bank's commodity risk management group and is responsible for managing energy hedges for bank clients. In addition, Ms. Kase has been developing a computer trading program for energy futures and designing new technical indicators.