TRADING TECHNIQUES

Low-Lag Indicator, Short-Term Reversals

Trade The Price Swings

You can use this method to identify short-term price reversals.

by Barbara Star, Ph.D.

I n the futures markets, timing is critical. The ability to recognize price shifts quickly is not only a desirable trait; it is a crucial trading skill. Traders need technical indicators that can keep pace with market conditions and alert them to possible changes. Here's a low-lag indicator that identifies short-term price reversals and suggests a few trading strategies.

REDUCE LAG TIME

Traders typically rely on moving averages to help identify price direction. But short-term traders often find that moving averages lag too much. Instead, they can turn to the linear regression indicator, which offers many of the same benefits as a moving average, but with the added advantage of reduced lag time.

The linear regression indicator is actually the endpoint of a type of trendline. It computes price direction based on a statistical method known as the *least-squares fit†*, which plots a straight line though the price datapoints rather than averaging the datapoints. As the direction of the market changes, the direction of the endpoint of the straight trendline changes sooner than would a moving average of the price points.

I have discovered that a five-unit linear regression indicator hugs price well. It reduces lag time by turning two bars earlier than a simple moving average and one bar sooner than an exponentially smoothed moving average of the same length. As shown by the daily chart of the
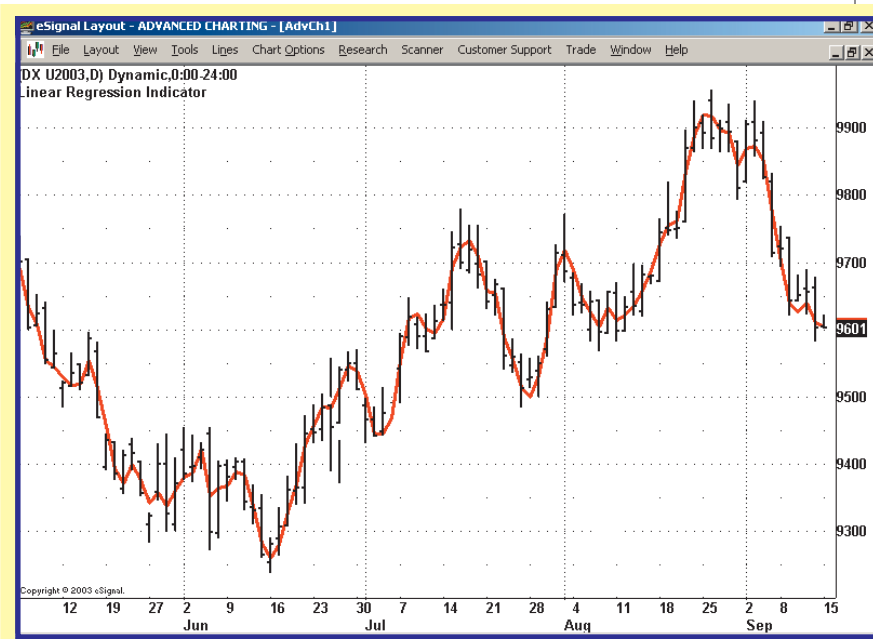

FIGURE 1: THE US DOLLAR INDEX WITH THE LINEAR REGRESSION INDICATOR. The red five-unit linear regression indicator plotted on price is very responsive to short-term price shifts, as illustrated in this chart of the September 2003 dollar index contract.
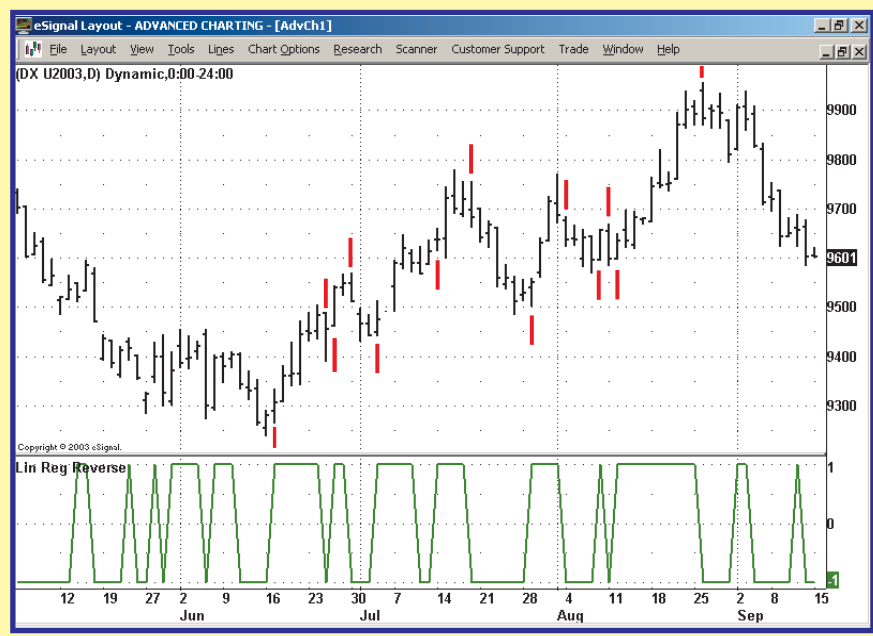

FIGURE 2: THE LINEAR REGRESSION REVERSAL INDICATOR. The linear regression reversal indicator displays the direction of the five-unit linear regression indicator as a +1 if price is trending up or a -1 if price is moving down. The red lines show where the indicator changed direction from the middle of June to the middle of August on the September 2003 US dollar index contract.

ESIGNAL FORMULAS

Linear Regression Indicator
 // Provided by eSignal (c) 2003 //
///

```
function preMain()
{
setStudyTitle("Linear Regression Indicator");
setCursorLabelName("LR", 0);
setDefaultBarFgColor(Color.red, 0);
setDefaultBarThickness(3, 0);
setPriceStudy(true);
}

function main(Length) {
if(Length == null) Length = 5;
var sum = 0;
var i = 0;
var mt = 0;
var wt = 0;

for(i = Length; i > 0; i--)
sum += (i - (Length + 1) / 3) * close(i - Length);
wt = 6 / (Length * (Length + 1)) * sum
return wt;
}
```

Linear Regression Reversal Indicator //
 // Provided by eSignal (c) 2003 //

```
function preMain()
{
setStudyTitle("Lin Reg Reverse");
setCursorLabelName("LRR", 0);
setDefaultBarFgColor(Color.green, 0);
```

```
setDefaultBarThickness(2, 0);

}

function main(Length) {
    if(Length == null) Length = 5;
    var sum = 0;
    var i = 0;
    var mt = 0;
    var WT = 0;
    var vWT2 = getGlobalValue( "WT2" );

if (vWT2 == null) {
setGlobalValue( "WT2", 0 );
}

for(i = Length; i > 0; i--)
sum += (i - (Length + 1) / 3) * close(i - Length);
WT = 6 / (Length * (Length + 1)) * sum

if(WT >= vWT2)
    {
    setGlobalValue( "WT2", WT );
    return 1;
    }
    else
    {
    setGlobalValue( "WT2", WT );
    return -1;
    }

return;

}
```

—B.Star

September 2003 dollar index (Figure 1), changes in short-term price direction stand out clearly and offer timely trend and countertrend trading opportunities.

MAPPING THE TURNS
In order to track price swings easily, I created a linear regression reversal indicator based on the five-unit linear regression indicator. It records a +1 when price direction is up and -1 when prices reverse and move down. Figure 2 shows the reversal indicator applied to the same US dollar index contract that appeared in Figure 1. The red lines indicate the price bar at which the indicator reversed.

As the 15-minute chart of the December 2003 British pound contract illustrates, the reversal indicator also tracks intraday price turns well (Figure 3).
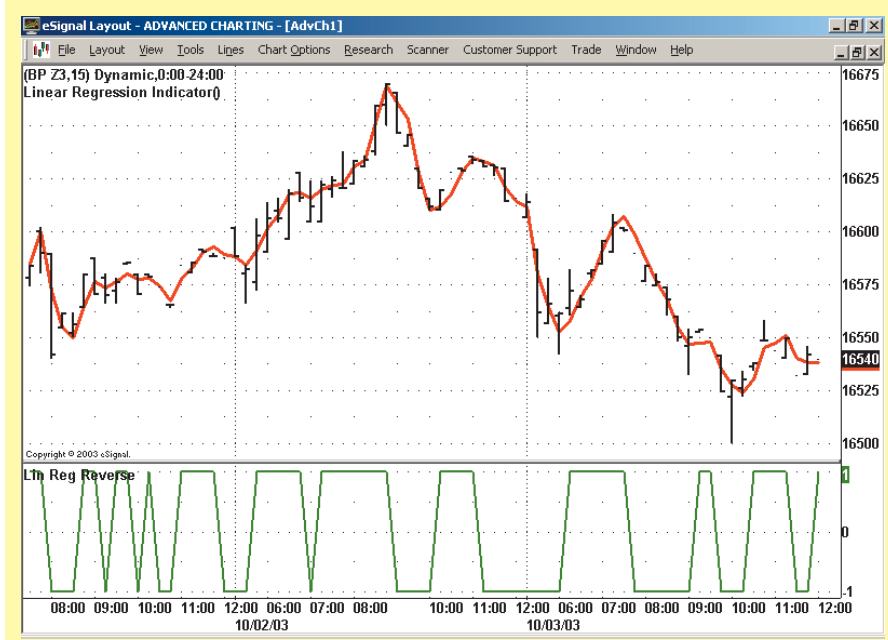
FIGURE 3: AN INTRADAY CHART OF THE DECEMBER 2003 BRITISH POUND. Both the linear regression indicator (in red) and the linear regression reversal indicator (in green) are plotted on this 15-minute chart of the December 2003 British pound.

Here's a low-lag indicator that identifies short-term price reversals.
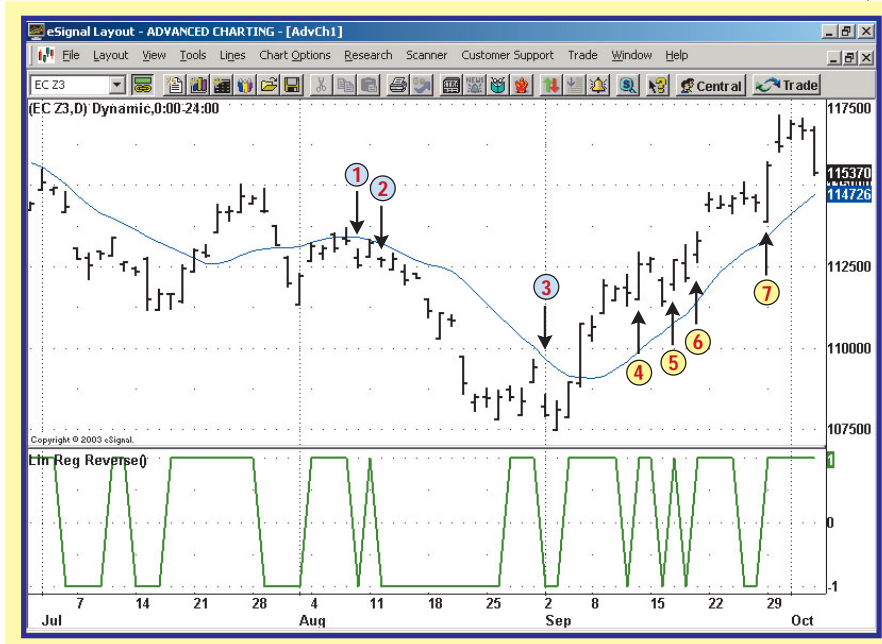
TRADING STRATEGIES

Those who enjoy frequent trading activity could rely on the linear regression reversal indicator to supply both long and short signals. A simple method would be to treat a rise to +1 as an alert to go long. The actual entry would occur only if the next price bar broke or closed above the high of the alert price bar. Use a trailing stop as an exit rather than wait for an indicator shift to a -1. By the same token, an indicator decline to -1 would serve as an alert to go short. The entry would occur only if the next price bar either moved lower or closed lower than the alert bar. Again, use a trailing stop to exit. Try this on Figure 2, where the red lines function as the reversal alerts.

The indicator also lends itself to a variation on the classic swing trading technique of buying on dips in an uptrend and selling the rallies in a downtrend. Traders who might not wish to track every price turn could use the linear regression reversal indicator to identify only those trades that move in the direction of a trend.

Figure 4 demonstrates this method with the December 2003 euro. Trend, in this example, is a 13-unit simple moving average of price. In general, when price is below the moving average but the reversal indicator rallies to +1, it signifies a countertrend rally. Look to go short when the indicator reverses back to -1 and the downtrend resumes. (See points 1–3.) When price is above the moving average and the indicator pulls back to -1, look to buy when the indicator reverses to +1 and resumes its uptrend (points 4–7).

SUMMARY

As with any technical tool, the linear regression reversal indicator has its drawbacks. The most noticeable is its tendency to reverse more often during times when prices move

FIGURE 4: A TRADING STRATEGY WITH THE DECEMBER 2003 EURO. By adding a simple moving average, the linear regression reversal indicator may also be used in a variation of swing trading. The arrows point to entries that potentially resume trend after price has made a countertrend rally or pullback.

sideways in a trading range or when there is a minor correction in a trend. However, for traders who wish to catch short-term price swings, it possesses a greater ability to keep pace with market conditions than many other indicators.

Barbara Star, Ph.D., is a former university professor and part-time trader. She is a past vice president of the Market Analysts of Southern California and led a MetaStock users group for many years. She is a frequent contributor to S&C. Currently, she provides individual instruction and consultation to those interested in learning technical analysis.

SUGGESTED READING

Rafter, William [2003]. "The Moving Trend," *Technical Analysis of* STOCKS & COMMODITIES, Volume 21: January.

†See Traders' Glossary for definition

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