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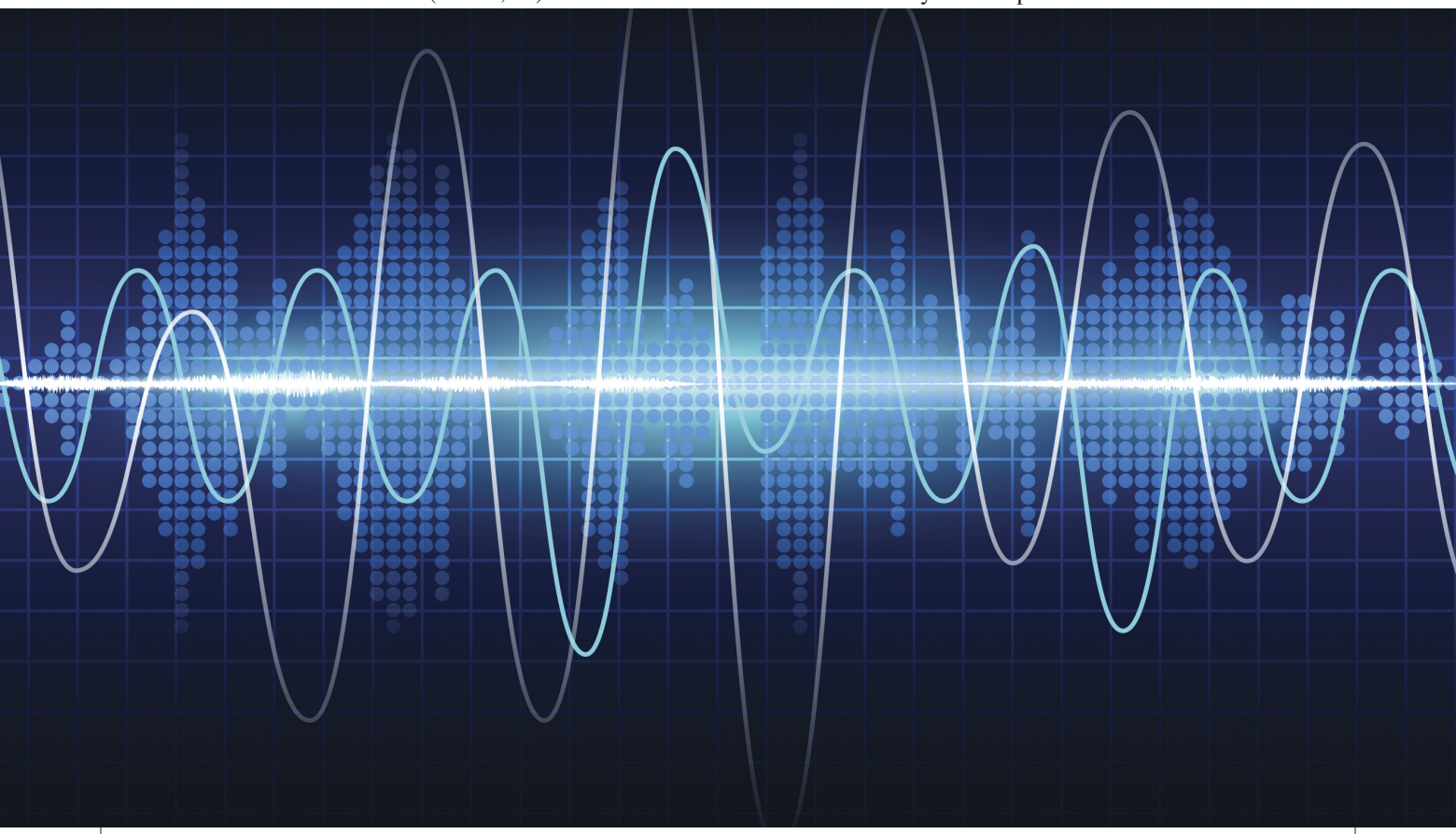


A Momentum Indicator

The Stochastic Distance Oscillator

Here is a new variation on the classic stochastic oscillator, based on price maxima and minima over a range of days. It indicates overbought and oversold levels and helps to identify bull and bear trend changes.

by Vitali Apirine

The *stochastic distance oscillator* (SD oscillator, or SDO) is a momentum indicator that shows the size of the current distance relative to the maximum–minimum distance range over a set number of periods. The SD oscillator identifies overbought and oversold levels, centerline crossovers. Signals can also be generated by looking for general trend identification and trend change.

The SD oscillator is based on the classic stochastic oscillator, which was developed by George C. Lane in the late 1950s. That oscillator compares the price of a security to its price range over any time period. The oscillator is useful in identifying oversold and overbought levels on a scale of zero to 100%, and in determining turning points in prices. As Lane wrote in his May 1984 article in this magazine, "This method is based on the observation that as price decreases, the daily closes tend to accumulate ever closer to their extreme lows of the daily range. Conversely, as price increases, the daily closes tend to accumulate ever closer to the extreme highs of the daily range. This concept also holds if you are working in either a weekly or monthly degree." Meanwhile, the *stochastic distance oscillator* is also a relative gauge and it serves to indicate a stock's current momentum. Momentum is often thought to precede a change in price.

Calculation

Here is how the stochastic distance oscillator is calculated:

%D = (Abs(current distance) – Abs(minimum distance)) / (Abs(maximum distance) – Abs(minimum distance)) * 100

PHOOSHUTTER/SHUTTERSTOCK

METASTOCK

FIGURE 1: STOCHASTIC DISTANCE OSCILLATOR. Here is a demonstration of the current distance, maximum distance, and minimum distance in the upper pane. The SDO (200,12,3) is in the middle pane. The Hang Seng index is in the lower pane. A typical setting for the overbought threshold is 40 and −40 for the oversold threshold.

where:

Current distance: Distance between the current price and the price *n* periods ago (12 or 40 days)
Minimum distance: Minimum distance between the prices for 12 or 40 days for the lookback period (200 days)
Maximum distance: Maximum distance between the prices for 12 or 40 days for the lookback period (200 days)

Absolute values are used to ensure positive numbers.

If the closing price is above the close *n* periods ago then: the SDO = %D
If the closing price is below the close *n* periods ago then: the SDO = –%D
If the closing price equals the close *n* periods ago or the current distance equals the minimum distance then: the SDO = 0

Multiply by 100 to move the decimal point two places. Rarely, SDO can reach extremes (100, –100).

The SDO is smoothed by an exponential moving average (EMA). The EMA can vary from 3 to 6. Other values can be substituted depending on your trading style and goals.

See the sidebar "Formula For The Stochastic Distance Oscillator, In MetaStock" for an example of the formula coded for the MetaStock platform.

Figure 1 shows an example chart demonstrating the current distance, the maximum distance, and the minimum distance in the upper pane; the SDO (200,12,3) indicator in the middle pane; and the Hang Seng index in the lower pane.

The values of 200,12,3 or 200,40,3 are typical settings used with the SDO, where the first parameter is 200 days (the lookback period), the second parameter is 12 or 40 days (*n* periods), and the third parameter is an EMA length that smooths the SDO line.

Settings use 40 as the overbought threshold and –40 as the oversold threshold. Other values can be substituted depending on your trading style and goals.

FORMULA FOR STOCHASTIC DISTANCE OSCILLATOR, IN METASTOCK

Here is coding for the stochastic distance oscillator, SDO(200,12,3), for the MetaStock platform:

```
LBPeriod:=200;
Period:=12;
Pds:=3;

Dist:=Abs(C-Ref(C,-Period));
D:=(Dist-LLV(Dist,LBPeriod))/(HHV(Dist,LBPeriod)-
LLV(Dist,LBPeriod));
DD:=If(C>Ref(C,-Period),D,If(C<Ref(C,-Period),-D,0));
Mov(DD,Pds,E)*100;
```

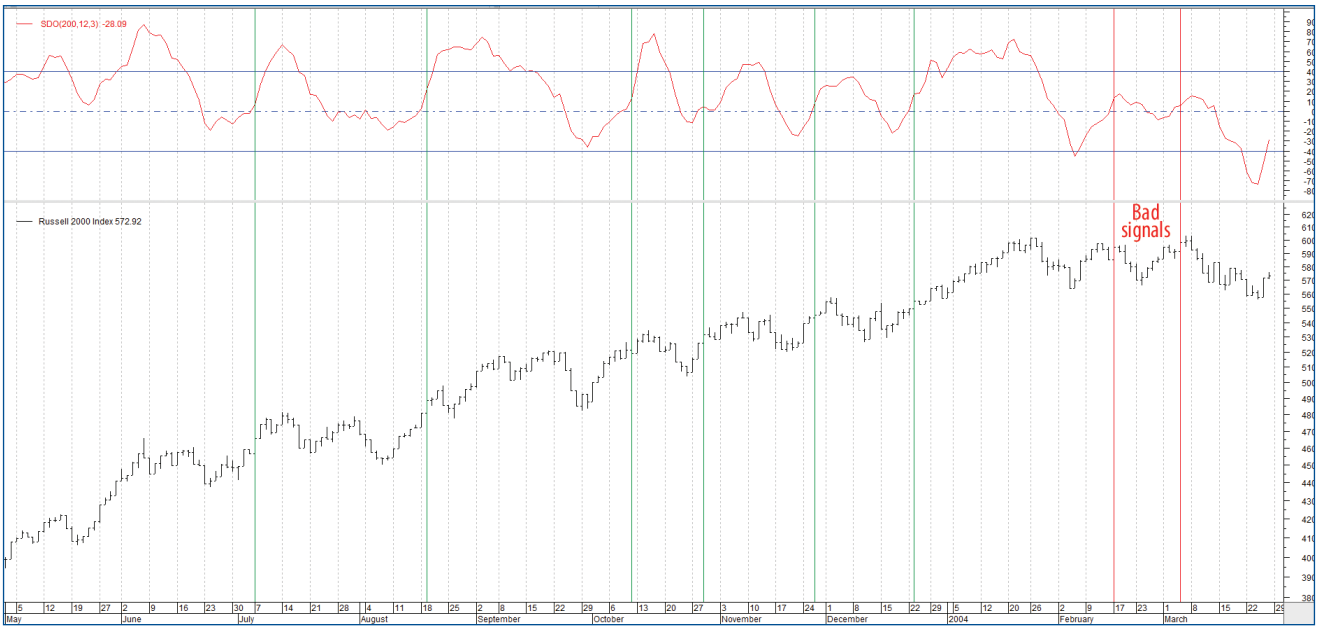


FIGURE 2: STRONG UPTREND, RUSSELL 2000 INDEX. This chart shows the SDO (200,12,3) in the upper pane and the Russell 2000 index from May 2003 to March 2004 in the lower pane. Bullish centerline crossovers (green lines) can be used as entry points for long trades during a strong uptrend. Here, the signals worked until February–March 2004 (red lines).

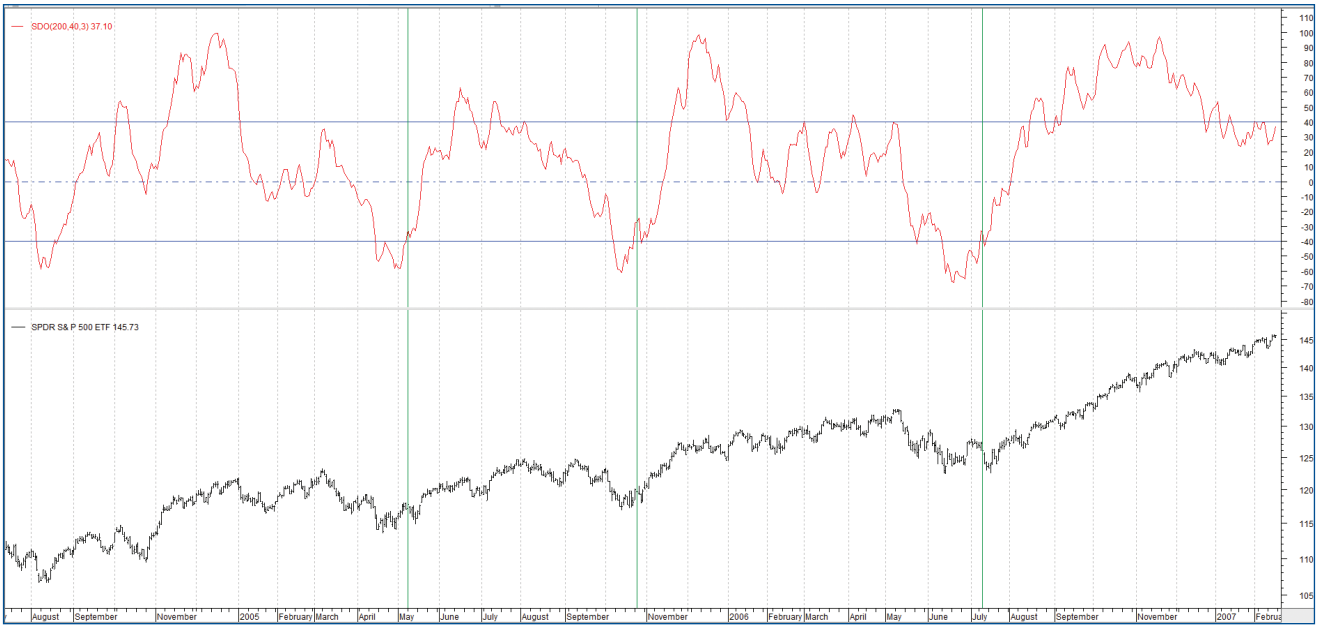


FIGURE 3: UPTREND, S&P 500 ETF (SPY). This shows the SDO (200,40,3) in the upper pane and the SPY from July 2004 to February 2007 in the lower pane. When the larger trend is up, oversold readings can be used to identify pullbacks as potential entry points for long trades (green vertical lines).

The stochastic distance oscillator (SDO) is a momentum indicator that shows the size of the current distance relative to the maximum–minimum distance range over a set number of periods.

STRONG UPTREND

The chart in Figure 2 shows the SDO (200,12,3) in the upper pane and the Russell 2000 index from May 2003 to March 2004 in the lower pane. Bullish centerline crossovers (green lines) can be used as entry points for long trades during a strong uptrend. Signals worked until February–March 2004 (red lines).

The chart in Figure 3 shows another example of an uptrend. The chart shows the SDO (200,40,3) in the up-

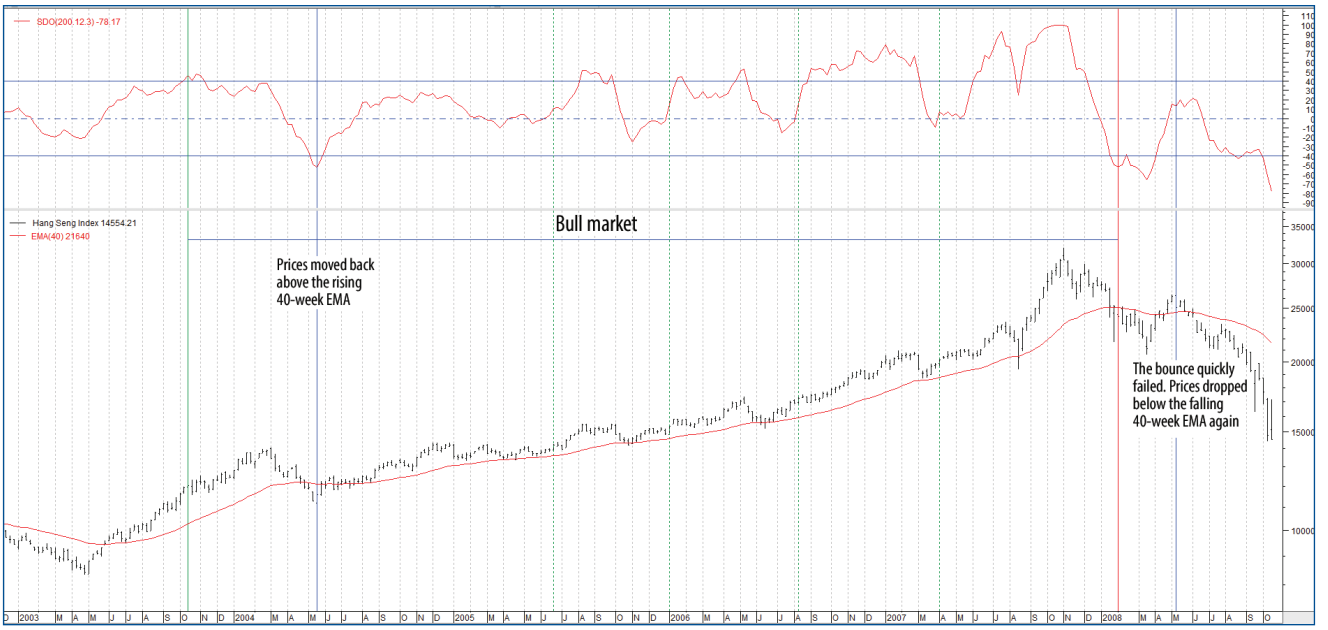


FIGURE 4: TREND IDENTIFICATION. This weekly chart shows the SDO (200,12,3) in the upper pane and the Hang Seng index with a 40-week exponential moving average in the lower pane from December 2002 to October 2008. You can see two SDO oversold readings, in May 2004 (blue vertical line) and in February 2008 (red vertical line). After the first SDO oversold reading, prices returned above the rising 40-week EMA, a buying opportunity. After the second SDO oversold reading, prices moved back above the falling 40-week line from April to May 2008. But this bounce quickly failed, a selling opportunity.

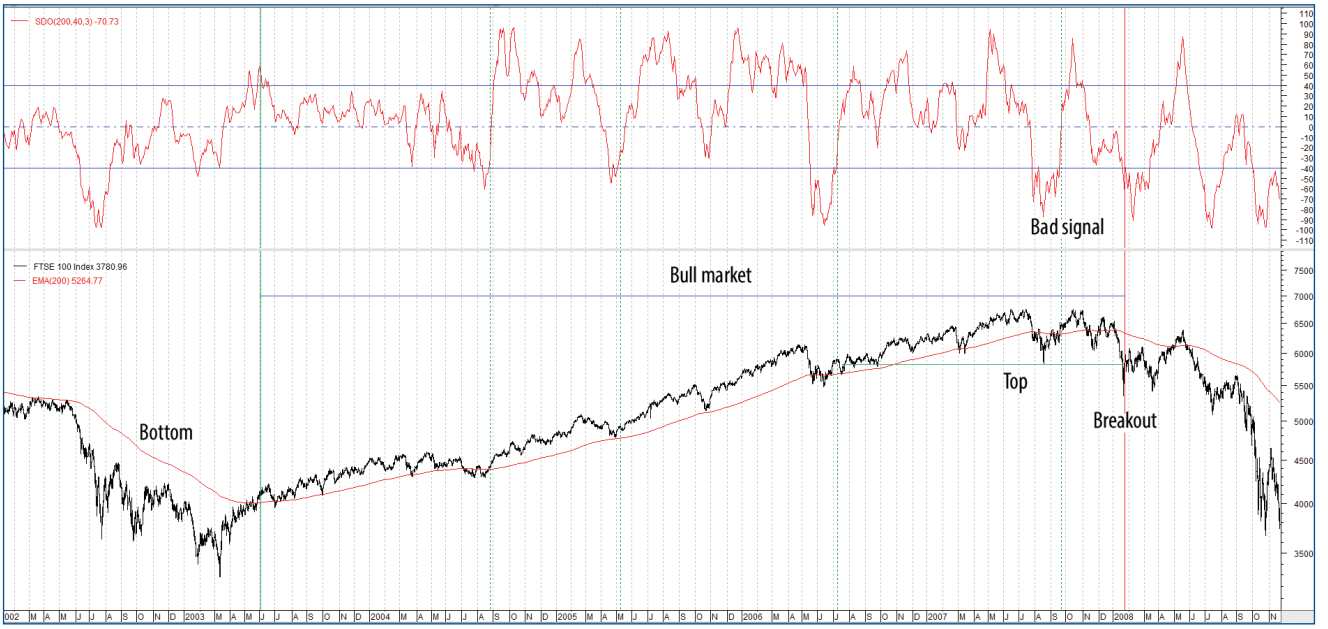


FIGURE 5: BULL MARKET, FTSE 100 INDEX. This shows the SDO (200,40,3) in the upper pane and the FTSE 100 index with a 200-day EMA in the lower pane from January 2002 to November 2008. Bullish oversold readings (green dashed vertical lines) show entry points for long trades during the 2003–2007 bull market. You can see a bad signal in September 2007 during the top formation. An SDO overbought reading with a rising 200-day EMA in June 2003 (green vertical line) and an SDO oversold reading with a falling 200-day EMA in January 2008 (red vertical line) defined the bull market.

per pane and the S&P 500 ETF (SPY) from July 2004 to February 2007 in the lower pane. The SDO oscillates between oversold and overbought levels. When the larger trend is up, oversold readings can be used to identify pullbacks as potential entry points for long trades (green vertical lines).

TREND IDENTIFICATION

The weekly chart in Figure 4 shows the SDO (200,12,3) in the upper pane, and in the lower pane, the Hang Seng index with a 40-week exponential moving average from December 2002 to October 2008. There were two SDO oversold readings in May 2004 (blue vertical line) and

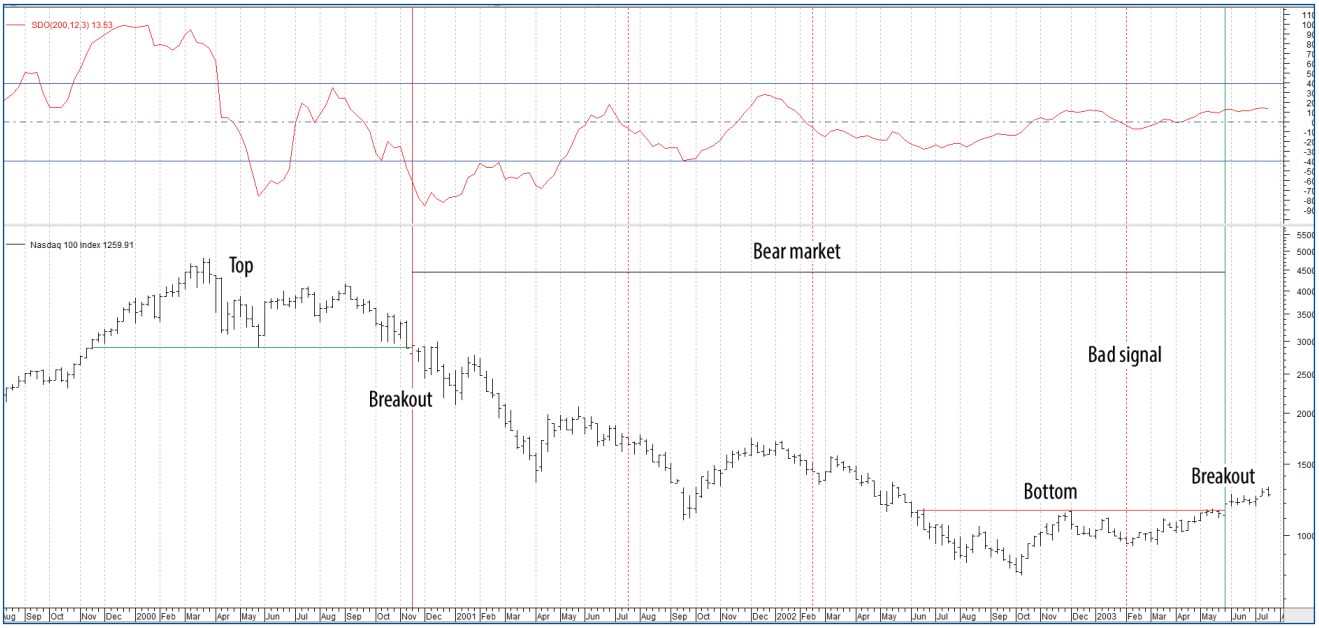


FIGURE 6: BEAR MARKET, NASDAQ 100 INDEX. This weekly chart shows the SDO (200,12,3) in the upper pane and the Nasdaq 100 index from August 1999 to July 2003 in the lower pane. Bearish centerline crossovers (red dashed vertical lines) suggest entry points for short trades during the 2001–2003 bear market. You can see a bad signal in February 2003 during the bottom formation. A break below support (green horizontal line) coupled with an SDO oversold reading in November 2000 (red vertical line) and then a break above resistance in May 2003 (red horizontal line) defined the bear market.

FIGURE 7: BEAR MARKET, SHANGHAI COMPOSITE INDEX. This shows the SDO (200,40,3) in the upper pane and the Shanghai Composite index from October 2003 to April 2006 in the lower pane. Bearish centerline crossovers (red dashed vertical lines) show entry points for short trades. You can see a bad signal in October 2005 during the bottom formation. A price crossover below the 200-day EMA coupled with an SDO oversold reading (red vertical line) in May 2004 and then later, an overbought reading (green vertical line) coupled with a break above resistance (red horizontal line) in January 2006 defined the bear market.

February 2008 (red vertical line).

Prices came back above the rising 40-week EMA after the first SDO oversold reading. It was a buying opportunity. Prices moved back above the falling 40-week EMA from April to May 2008 after the second SDO oversold reading. This bounce quickly failed. It was selling opportunity. Bullish centerline crossovers (green dashed vertical lines) showed entry points for long trades.

An SDO overbought reading with a rising 40-week EMA in October 2003 (green vertical line) and an oversold reading in February 2008 (red vertical line) with a falling 40-week EMA defined the bull market.

The chart in Figure 5 shows the SDO (200,40,3) in the upper pane and the FTSE 100 index with a 200-day

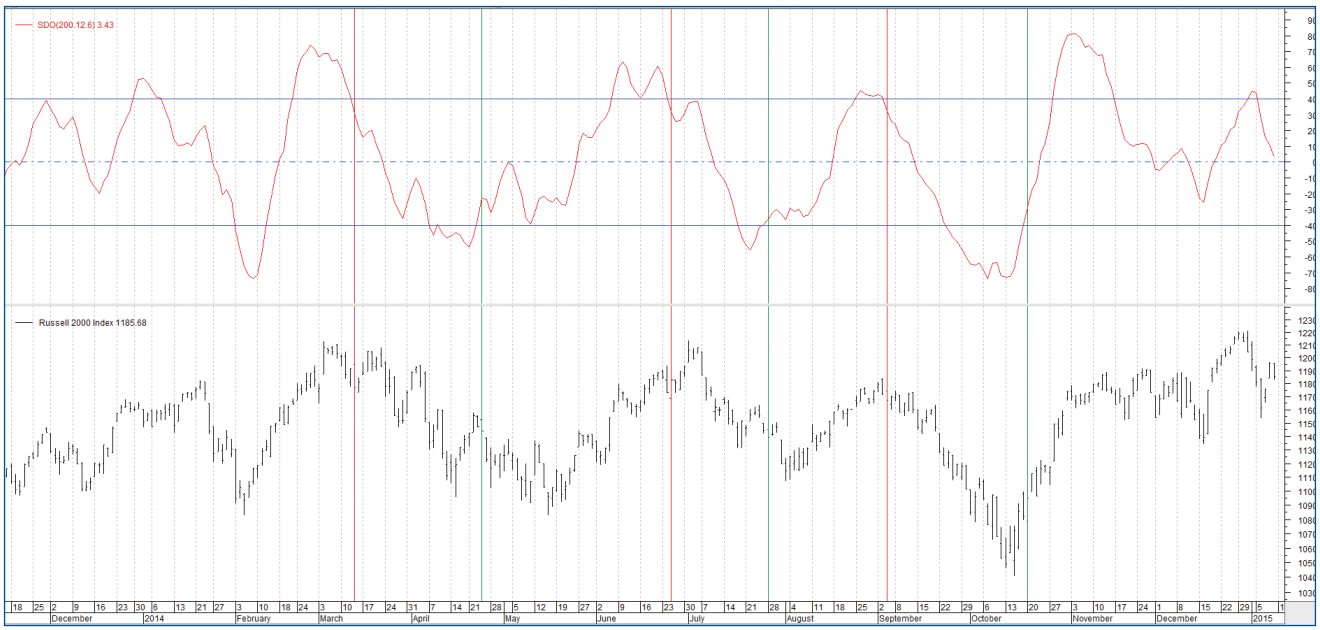


FIGURE 8: TRADING RANGE, RUSSELL 2000 INDEX. This shows the SDO (200,12,6) in the upper pane and the Russell 2000 index in the lower pane from January to November 2014. The index peaked soon after the SDO reached 40 and bottomed soon after the stock reached −40.

exponential moving average from January 2002 to November 2008 in the lower pane. Bullish oversold readings (green dashed vertical lines) show entry points for long trades during the 2003–2007 bull market. There was a bad signal in September 2007 during the top formation. An SDO overbought reading with a rising 200-day EMA in June 2003 (green vertical line) and an SDO oversold reading with a falling 200-day EMA in January 2008 (red vertical line) defined the bull market.

The weekly chart in Figure 6 shows the SDO (200,12,3) in the upper pane and the Nasdaq 100 index from August 1999 to July 2003 in the lower pane.

Bearish centerline crossovers (red dashed vertical lines) suggest entry points for short trades during the 2001–2003 bear market. There was a bad signal in February 2003 during the bottom formation. A break below support (green horizontal line) coupled with an SDO oversold reading in November 2000 (red vertical line) and then later a break above resistance (red horizontal line) in May 2003 defined the bear market.

The chart in Figure 7 shows the SDO (200,40,3) in the upper pane and the Shanghai Composite index from October 2003 to April 2006 in the lower pane. Bearish centerline crossovers (red dashed vertical lines) show entry points for short trades. There was a bad signal in October 2005 during a bottom formation. A price crossover below the 200-day EMA with an SDO oversold reading (red vertical line) in May 2004 and an overbought reading (green vertical line) coupled with a break in resistance (red horizontal line) in January 2006 defined the bear market.

SIDEWAYS

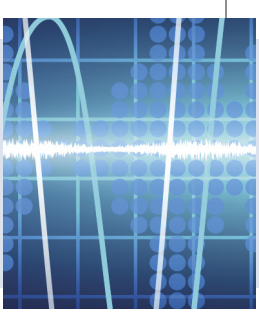
Momentum oscillators such as the SDO also work when prices move sideways within a range. The chart in Figure 8 shows the SDO (200,12,6) in the upper pane and the Russell 2000 index in the lower pane from January to November 2014. The index peaked soon after the SDO reached 40 and bottomed soon after the stock reached −40.

CONCLUSION

The stochastic distance oscillator can be used with securities or indexes that trend. It is also suitable for trading ranges. The SDO can be used to identify buying/selling opportunities in harmony with the larger trend.

The SDO can also be used to identify trend changes. A break in support or a bearish price crossover of the 200-day EMA coupled with an oversold SDO reading can signal the start of a downtrend. Conversely, a failure

When the larger trend is up, oversold readings can be used to identify pullbacks as entry points for long trades.



of resistance to hold coupled with an SDO overbought reading can signal the start of an uptrend.

Like all technical indicators, it is important to use the SDO in conjunction with other technical analysis tools.

Vitali Apirine is a programmer engineer with an interest in technical analysis, especially the application of indicators such as MACD, RSI, OBV, etc. to trading. He may be reached at vitapirine@gmail.com.

*See our **Traders' Tips** section beginning on page 48 for implementation of Vitali Apirine's technique in various technical analysis programs and trading platforms. Accompanying program code can be found in the Traders' Tips area at Traders.com.*

*The code given in this article is available in the **Article Code** section of our website, Traders.com.*

FURTHER READING

Lane, George C. [1984]. "Lane's Stochastics," *Technical Analysis of* STOCKS & COMMODITIES, Volume 2, May.

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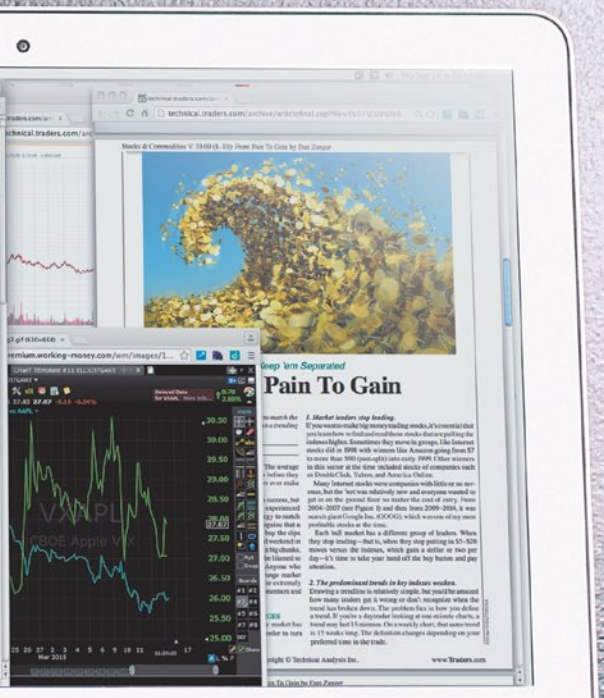

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