

Chapter Seven:

RSI—Momentum’s Problem Child

Writing about his Relative Strength Index (RSI) in *New Concepts in Technical Trading Systems*, Welles Wilder noted five different “interpretative factors” or capacities that the RSI would bring to price charts: tops and bottoms, chart formations within the indicator itself, support and resistance, divergences, and a phenomenon he called “failure swings.”

In the years since Wilder first introduced his technical tool, some of these capabilities are more commonly used by traders than others. The RSI is still a popular tool for spotting divergences and for warning traders of overbought and oversold conditions. The RSI has become less widely used for its ability to create chart patterns, and traders have since learned that overbought and oversold conditions do not in and of themselves indicate market tops and bottoms.

Overall, however, the RSI remains widely available in charting software programs and is as often a feature in the price charts of technical traders as any other oscillator, including stochastics and the moving-average convergence divergence indicator (MACD). In addition to discussing exactly what the RSI measures, we will spend time looking at the different ways that Wilder intended his indicator to be used.

We will also use this chapter as an occasion to examine the critique of momentum indicators, like the RSI, made by Tushar Chande in his

book, *The New Technical Trader*. We will highlight his indicator, StochRSI or stochastic RSI, which Chande has suggested improves on the failings of traditional momentum indicators.

What exactly does the Relative Strength Index measure? One way of thinking about the RSI is that it compares the bullishness of bullish sessions to the bearishness of bearish sessions, using points gained or lost as the gauge of “how bullish is bullish/how bearish is bearish.” This differs from the way the stochastic measures bullishness or bearishness, but in both instances the technical indicators are looking forward to determine which of the two forces, those betting on higher prices or those betting on lower prices, is in control of the market.

The RSI is calculated by first determining a figure called relative strength, or simply RS. RS is the ratio between the “average of X days up closes in points” and the “average of X days down closes in points.” The X refers to the number of sessions with points to be averaged; generally, traders use 9 or 14 sessions, with 14 perhaps being the most common default.

So calculating RS would mean, for example, taking all the “up days” over the past 14 days, and averaging the number of points gained. Then take all the “down days” over the past 14 days and average the number of points lost. That figure is relative strength.

To get the Relative Strength Index, RS is then put in the following equation:

$$RSI = 100 - 100 / 1 + RS$$

This provides for a figure between 0 and 100, and a number that will move higher or lower based on the dominance of buyers or sellers in the marketplace as calculated by RSI.

But it is not the 0 and 100 levels that concern traders using RSI. Rather two other levels—at 70 and 30—mark the thresholds between what is considered “normal” or unremarkable market behavior with relative

balance between buyers and sellers, and what is considered “extreme” in which one side of the market is in complete, if not overwhelming, control. It is the latter situation that is often referred to as either overbought (when buyers have maximum control) or oversold (when sellers have maximum control) conditions.

As John Murphy writes in *The Visual Investor*, the ability to determine overbought and oversold levels in the market is the “main value of this oscillator.” That said, he encourages traders to tweak and adjust the RSI depending on market conditions, tightening the RSI when volatility is low and loosening the RSI when volatility is high. Tightening the RSI means shortening the duration to something shorter than 14 at the very least, and maybe even shorter than 9. Loosening the RSI means lengthening the duration beyond 14 periods.

Murphy makes another point that is worth noting, particularly in light of what we’ve learned from the BOSO discussion with regard to the stochastic:

The crossings of the 70 and 30 lines should always be watched closely. During a strong uptrend, it’s not unusual for an RSI oscillator line to rise above 70 and stay there. That is usually the sign of a strong uptrend. Prices may stay above the 70 line for weeks. In such instances, it’s probably best to ignore the oscillator for the time being, as long as it stays above 70.

Compared to the stochastic, I have found chasing the RSI into overbought or oversold territory much more difficult. On standard, default settings, markets have tended to remain longer in extreme conditions as measured by the stochastic compared to the RSI. This may mean that overbought and oversold conditions in the RSI come closer to marking true instances of buyer and seller excess. As such, the RSI would be a better indicator for tracking tops and bottoms based on overbought and oversold readings.

I have never been a frequent user of the RSI. For me, there were always other oscillators—such as the stochastic and the MACD histogram—that were preferable to use when scanning markets for divergences, which is perhaps the best of the “most common” ways that traders use oscillators like the RSI. That said, many, many market technicians do use and appreciate the RSI. What I want to do here is both outline the best of the most common ways to use RSI and re-introduce some of the original ways that J. Welles Wilder Jr. encouraged traders to use and trade his index.

Among the ways of using the RSI that have gone somewhat out of favor is the strategy of using the overbought and oversold levels to indicate tops and bottoms, respectively, in markets. Wilder wrote in his book (1978) that “the Index will usually top out or bottom out before the actual market top or bottom, giving an indication that a reversal or at least a significant reaction is imminent.”

Unfortunately, as we saw in the chapter on the stochastic, markets that become overbought or oversold often remain overbought or oversold for a significant period of time. Much of the “easy money” in a trade is made when a market is overbought and making new high after new high, to the often-annoyed astonishment of those who are not onboard. So to abandon a market because it is overbought or oversold, or to automatically connect those conditions with potential tops or bottoms, can relegate a trader to missing out on some incredible market moves.

Because the RSI has the tendency to mimic price action (in fact, it is when oscillators like the RSI stop mimicking price action that technicians become concerned), some RSI traders have used patterns in the oscillator as advance warnings of potential changes in the underlying market. For example, a trader may notice a support or resistance level in the RSI, and then look at the price chart to see if that support or resistance in the indicator is reflected in the market. Sometimes, wrote Wilder, “areas of support and resistance often show up clearly on the Index before becoming apparent on the bar chart.” Noting instances

where an RSI meets resistance can help a trader pay closer attention to what is happening—or may soon be happening with price. The same is true with patterns such as flags and triangles.

Two of Wilder's techniques for using the RSI, however, deserve special emphasis: the divergence and the failure swing. I have already discussed the nature of divergences in the previous section on stochastics, so I will move more quickly to examples of positive and negative divergences in the RSI. I will also re-introduce Wilder's notion of the failure swing, a type of pattern that can appear in the RSI and one that often dove-tails with the signals provided by positive and negative divergences.

Divergences

Suffice to say that divergences in the RSI work virtually the same way that divergences in the stochastic, the MACDH, or other momentum oscillators do: when prices make a higher high when the indicator makes a lower high, a negative or bearish divergence is created. When prices make a lower low when the indicator makes a higher low, a positive or bullish divergence is created.

One thing is worth repeating, however. A divergence signals a waning of momentum. It does not necessarily signify new momentum in the opposite direction. Divergences appear frequently in uptrends and downtrends in response to the tug-of-war between those trying to drive momentum further faster and those betting against it. Again, there are many divergences in a trending market, but only one of them will end up signaling the end of the trend.

As such, divergences are best thought of first and foremost as warnings to exit, and second as opportunities for a reversal. I do not want to minimize the capacity of divergences to spot reversals—next to Japanese candlestick and 2B patterns, there may be no better tool than divergences in this regard. But first things first. There will be plenty of

opportunities to exploit momentum in a new direction if and when the warning of a divergence turns into an outright reversal.

Consider this example of a negative divergence in the U.S. Dollar/Canadian Dollar currency pair in February 2007 (Figure 7.1). This negative divergence would lead to a stunning collapse in the value of the American greenback versus the Canadian “loonie,” as [forex](#) traders call it. The market for USD/CAD had been wedging higher throughout January after a strong run higher in 2006.

Although the USD/CAD did not make clear, towering peaks in January, it was clear that the market was making higher highs and higher lows. What was equally clear, however, was that the RSI was making lower highs and lower lows at the same time. This negative divergence pattern lasted throughout the month of January until finally, on February 9th, the sellers overwhelmed the buyers and USD/CAD broke down.

Figure 7.1 | U.S. Dollar/Swiss Franc | Daily | May 2007

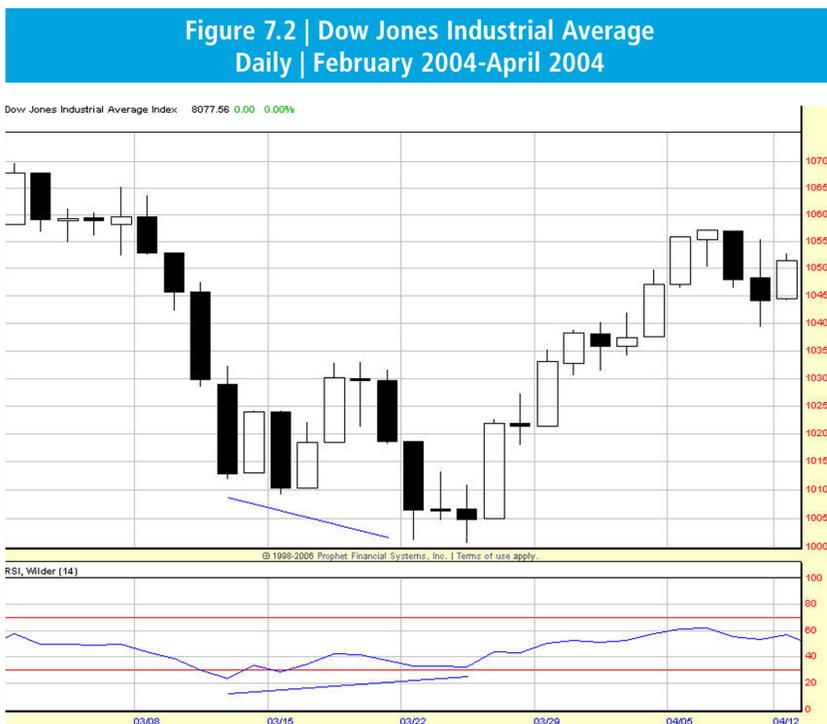


The negative divergence in the Relative Strength Index over the course of January was confirmed as the market for USD/CAD broke down early in February.

Chart courtesy of eSignal

While this breakdown was an excellent opportunity for momentum traders, those who had been long the month before could not say that they had not been warned. The failure of the RSI to confirm the higher highs in price—a failure that lasted for an entire month—was ample market intelligence that momentum to the upside was waning.

An example of a positive divergence comes from the Dow Jones Industrials as they experienced the first major correction of the 2004 bear market (Figure 7.2). Here, the positive divergence did not lead to a new trend; within a few weeks after the positive divergence, the Dow Industrial Average had rolled over en route to fresh lows. However, for traders who were short that first major correction of 2004, and momentum



As the 2004 bear market was just beginning, the positive divergence in the RSI provided the first counter-trend bounce in March.

Chart courtesy of Prophet Financial Systems, Inc.

traders looking to exploit reversals, the positive divergence provided plenty in terms of both exit warning and entry opportunity.

The exit warning arrived on March 25th, just as the RSI was hooking higher to complete the higher low that is the signature of the positive or bullish divergence pattern. After that close, there was simply no reason for a trader betting against the Dow Jones to continue to do so.

The confirmation of the positive divergence as a reversal pattern came two days later on the follow-through confirmation close to the upside. Not only was the bullishness of this session, and the ones following over the next six-odd days, brought on by those who were short and covering their positions later than they would have preferred, but also by momentum technicians who correctly saw in the positive divergence an opportunity for gain.

Failure Swings

The idea of the failure swing is similar to the idea behind divergences and the 2B technique discussed in the first section. The set-up for a failure swing begins when a market makes an overbought or oversold extreme in the RSI. Let's use the example of a bearish failure swing that can occur at a market top. The market moves higher, pushing the RSI above 70 to clear overbought territory. The RSI then pulls back below 70, moving back from overbought territory, before rallying again. Only this time, the RSI fails to re-enter overbought territory (i.e., fails to move above 70) and instead, reverses and moves low enough to fall below the low between the initial RSI peak (the one that made it above 70) and the second RSI peak (the one that failed to make it above 70).

What happens is that the RSI fails to follow-through—to the upside in the case of tops and to the downside in the case of bottoms. Essentially, the RSI makes a lower high (or a higher low) and that action, in combination with the penetration of the overbought or oversold level, is what signals the failure swing.

Figure 7.3 | September Silver | Daily | May 2002-August 2002

A failure swing in silver futures in July 2002 helped traders take position in advance of the massive selling that hit the market at the end of July and again in mid-August.

Chart courtesy of Prophet Financial Systems, Inc.

Here are two examples, one bullish and one bearish, of failure swings in action. Figure 7.3 looks at the summer 2002 top in silver futures and Figure 7.4 looks at the end of the bear market in the S&P 500 in August 2004.

The instance of the top in silver futures in the summer of 2002 is interesting because so often a technician will see all the signs of a top except he will lack a specific pattern—especially the higher high necessary for a 2B or a negative divergence. The failure swing offers another sort of pattern that can also catch a top or bottom.

Notice on Figure 7.3 how the silver market makes a high in early June, pulls back, and goes on to make a somewhat lower high in mid-July.

Figure 7.4 | S&P 500 Index Daily | July 2004-September 2004



The bullish failure swing here in the S&P 500 in August anticipated the end of the 2004 bear market in the S&P 500.

Chart courtesy of Prophet Financial Systems, Inc.

vergence and the month-on-month bullish failure swing an opportunity to the upside.

Chande's Critique and StochRSI

I mentioned a critique of the RSI; a critique that, to be fair, is really extended toward all momentum oscillators. This critique was put forward by market technician Tushar Chande and Stanley Kroll in their book, *The New Technical Trader*. Chande and Kroll's critique of momentum oscillators is one that has been widely understood, if not widely accepted, by most technical analysts.

The core of the Chande critique is expressed by the following summary:

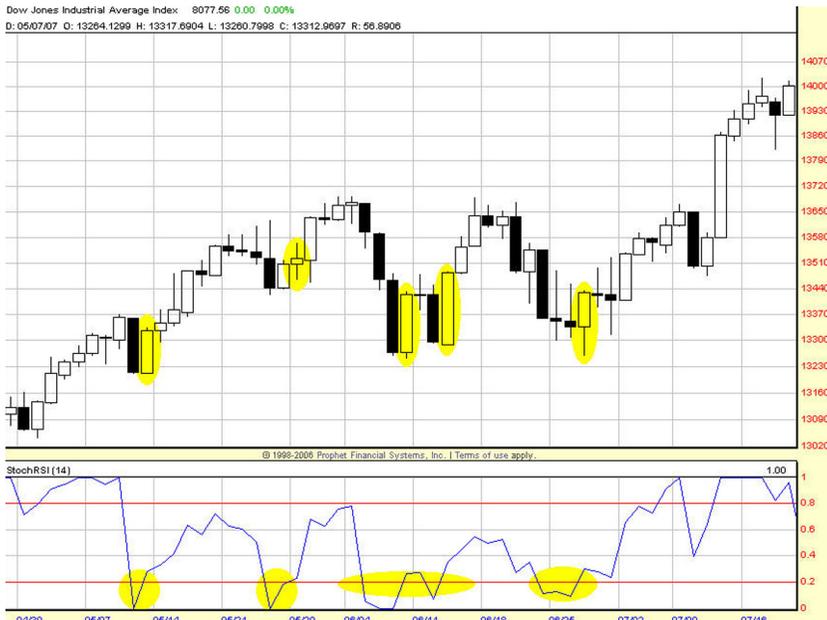
- None of them is a “pure” momentum oscillator that measures momentum directly.
- The time period of the calculations is fixed, giving a different picture of market action for different time periods.
- They all mirror the price pattern; hence, you may benefit more directly trading prices themselves.
- They do not consistently show extremes in prices because they use a constant time period.
- The smoothing mechanism introduces lags and obscures short-term price extremes that are actually valuable for trading.

Much of Chande and Kroll’s critique is boilerplate and accepted by momentum traders as merely the reality of their technical surroundings. What interested me in Chande and Kroll’s work was not the problem they found in other indicators, but more the indicator (or indicators) they saw as the solution.

There are a number of new, interesting indicators in *The New Technical Trader*. One of the ones that has gained a measure of widespread use is StochRSI (Stochastic Relative Strength Index). What is interesting about StochRSI is that it attempts to deal with the problems of momentum indicators by combining two of the more popular ones: the stochastic oscillator and the RSI.

Specifically, StochRSI is intended to improve the RSI. One “problem” that momentum indicators have is the inability to reveal true overbought and oversold extremes in trending markets. Typically, the RSI is considered overbought above 70 and oversold below 30. But because many markets will continue to move higher even after becoming overbought, the ability of the RSI to spot overbought tops and oversold bottoms is diminished.

Figure 7.5 | Dow Jones Industrial Average
Daily | March 2007-July 2007



Movements into and out of oversold territory represent signals of upside momentum to traders using the StochRSI.

Chart courtesy of Prophet Financial Systems, Inc.

Personally, I think waiting for a confirming close—a close above the high of the session during which the trading signal was created—is the best way to avoid getting whipped into bad positions. Sticking to that thinking here, we have a StochRSI buy signal as of the close of March 6. Two days later, on March 8, we get our first close above the high of March 6. That close, on March 8, is to be bought (or, failing that, the opening of the following session.)

The next clear instance of buying an oversold market does not come until the first half of May. Here, the StochRSI dives down sharply below the oversold level before bouncing back out of that area just as swiftly. The buy signal arrives on May 11th. The confirming close arrives one day (ac-

None of this, as far as I’m concerned, makes the study of price action in and of itself irrelevant. Again, price first and everything else second. But when choosing from among the various possible “seconds,” the StochRSI has shown itself to be a worthy oscillator for momentum traders to include within their arsenal of trading tools.