SFO Stocks Futures & Options

By Cynthia A. Kase

The Two Faces of Momentum

[***Editor's Note***: Momentum indicators can be used to help with precision exits, but they are "two-faced." Some momentum indicators work well in that after they generate a signal, the market almost always turns, but looking at their performance in the opposite way, there are many market turns that some indicators don't catch. This article by veteran trader turned market technician, Cynthia Kase, CMT, winner of the MTA's Best of the Best Award in Momentum, clears up the mechanical issues as to how to appropriately identify divergence and quantifies how well momentum indicators really work.]

I like to say that trades are like relationships – a lot easier to get into than to get out of. I believe in the adage that maintains that if you have a good exit system, entries hardly matter.

Our approach to entries is very simple. Using a bar length that is one-fifth to one-third the length of the bar upon which we wish to focus, we take second signals in the direction of the trend. We use simple momentum crossover signals and wait for a crossover, a pullback and a new crossover, at which time we consider the entry signal valid. Once a similar signal is generated on the main or "monitor" bar chart, we monitor the trade on that chart. Once in, our goal is to get out on the next bar following the maximum profit bar, or to cut our losses when necessary as soon as called for.

The two components of a good exit system are momentum divergence signals that identify market turns accurately and stops that are set in such a way as to minimize losses, but *also* allow profits to run.

We view using momentum divergence exits as "soft landings" and hope always to exit right after the maximum profit bar (the bar at which point the trade was the most profitable) through the use of such exits. Remember that stops are only useful if a market turns without warning, or if the trade has never become profitable to begin with. Using a stop is the "hard landing."

Toward this end, the focus of this article is on the use of momentum indicators for exits, and it covers two issues. The first issue relates to the *mechanics* of how to use momentum indicators. The second issue relates to the question of *how well* momentum indicators work.

Momentum Indicators – A Quick Review

Popular momentum indicators include the Stochastic, Relative Strength Index and MACD histogram. In our practice, not surprisingly, we also make use of the Kase PeakOscillator and KaseCD (KCD).

The *Stochastic* evaluates the placement of the close relative to a high/low price range over a certain time period. The idea behind the Stochastic is that in a market with good momentum, the closes will be moving in the direction of the trend. For example, the closes will rise relative to the high/low range in a rising market.

CHART 1 Crude Oil Combined

Created with TradeStation 2000 by Omega Research © 1999

The *RSI* looks at the ratio of up closes and down closes to the total amount of close-to-close fluctuations over a certain period. The idea is that if the market is moving with good momentum the rate of change of the closing prices will keep up with the rate at which the market is making new highs, in a bull market, or lows, in a bear market.

All standard oscillators are calculated as the difference between two moving averages. The *MACD histogram* is the difference between an exponential moving average oscillator and its own average. So, the MACD is an oscillator of an oscillator. If an oscillator is a rate of change or velocity indicator, the MACD histogram is then an acceleration indicator. Markets with good momentum will be accelerating not decelerating. Thus the MACD gives a clue as to the strength of the trend.

Momentum divergence signals are generated in the same manner for all momentum indicators. One looks for a higher or equal high in price to be matched by a lower or equal high in the momentum indicator for bearish divergence and the opposite for bullish divergence. Once a divergence signal is generated, traders should begin to take profit.

Let's look at ***Chart 1*** to identify *proper* divergence comparisons (in red) and *incorrect* comparisons (in blue). Making the distinction between the two will undoubtedly factor into a trader's success in the market. The following illustrates both correct and incorrect comparisons between price and momentum:

1. The first divergence, labeled "1," is correct because it compares two highs in price with two highs on the momentum indicator in a rising market.

2. The next divergence "2" is correct as it compares two lows in price with two lows on the momentum indicator in a falling market.

3. In a falling market, one does not compare highs, *only lows*, so comparison 3 is wrong. Also, even if the market was rising, the second high is lower than the first high. A comparison must be between rising highs or falling lows.

4. Along the same lines, one does not compare a high from a falling market to a high in a rising market, so "4" is also wrong.

5. There must be both a peak in price *and* a peak in the histogram. In this case, the price comparison is correct – two lows are compared in a falling market – but there is no downward peak relating to the first price low to be compared. The blue arrow labeled "5" illustrates this point.

6. Divergence "6" is correct because it compares two highs in price with two highs on the momentum indicator in a rising market.

7. In a rising market, one only compares highs, not lows, so comparison "7" is wrong.

8. In rising markets one compares rising highs, and in falling markets one compares falling lows. In this case, the second high is lower than the first high, so the highs are not rising but falling.

9. Finally, "9" is correct, similar to "6."

Avoid Mistakes in Identifying Divergence

In addition to these issues, there are two common errors traders make in identifying divergence: failing to properly identify peaks and not matching price to indicator peaks.

For a peak in price to actually be considered a peak or for a peak in the momentum indicator to actually be considered a peak, a bar following the peak must take place. In a rising market in which bearish divergence is taking

place, a price bar that has a lower high than the peak must be generated.

On the histogram, an indicator value with a lower value than the peak must be generated. The inverse is true for a bullish divergence in a bear market.

A low peak is circled and labeled "10" on the chart, with a red arrow pointing to the low. There is a higher low before and after the peak, which confirms the bar labeled as the low. It is fine to have a plateau made up of multiple bars with equal prices or indicator values – as long as the plateau is preceded by and followed by bars with less extreme values.

Next, the peak in price and the peak in the histogram do not have to take place on the same bar, but they should be close to each other. Our guideline is to have the peaks within two bars of each other on daily charts, and within no more than four of each other on intra-day charts.

Another rule of thumb to keep in mind – if prices continue with the trend before the divergences confirm, it is not a valid divergence. Let's get more specific. Say there was a peak in price followed by a peak on the momentum indicator. However, by the time that the momentum indicator confirmed its peak, prices had begun to rise again. In such cases, we would not consider the divergence to be valid.

Now, relative to the second issue, let's evaluate the performance of the Kase indicators, the PeakOscillator and KCD against the traditional indicators. The Kase indicators, rather than using a fixed number of periods, use a loop built into the code that chooses the best cycle length. Also, when volatility increases, traditional indicators often overreact. Kase's indicators account for changes in volatility and, thus, avoid such overreactions.

Both indicators are based on the Kase Serial Dependency Index where ln(H[N-1]/L[0])/V is used for up moves and ln(L[N-1]/H[0])/V for down moves, where:

H[N-1]	=	high n bars ago
H[0]	=	this bar's high
L[N-1]	=	low n bars ago
L[0]	=	this bar's low
V	=	historical volatility over n bars
N	=	a number from n1 to n2 that gives the highest resultant value for the index.

For those of you *not* into formulas, here's the written explanation of the above. Volatility is a measure of the standard deviation of the logarithmic rate of change of the market. Standard deviation is related to probability, for example a two standard deviation move has a 2.5-percent probability of occurrence, relative to a normal bell curve, which is based on random activity. Thus, the further the market moves in relationship to volatility, the less likely the movement is to be classified as random, and the more likely it is trending. Instead of using moving averages like old-fashioned oscillators do, Kase indicators use trend-indices based how far the market has moved relative to volatility. This is not to be confused with standard deviations of price, commonly called Bollinger Bands, which use only price and not volatility as their basis.

The two components of a good exit system are momentum divergence signals that identify market turns accurately and stops that are set in such a way as to minimize losses, but also allow profits to run.

The PeakOscillator is the difference between two trend measurements, one for rising markets and the other for falling markets, and the KCD is the PeakOscillator minus its own average. So, the PeakOscillator takes the place of a traditional oscillator, and the KCD takes the place of the traditional MACD. ["The Best Momentum Indicators," ***Bridge Trader***, May/June 1997, explains the Kase indicators, including these indices, the Kase PeakOscillator, KCD and DevStop in more detail – request reprint via www.kaseco.com.]

So, What's a Successful Indicator?

To measure how well the momentum indicators work, we first must define what constitutes a successful indicator. For purposes of this study, we measured an indicator's success rate in two ways. First, an indicator's success was measured in terms of how often the market turned sufficiently to hit stops following a momentum divergence signal. Second, success was measured by how often market turns that were of sufficient magnitude to hit stops were preceded by a divergence signal.

So, we can classify our performance measures in terms of "what follows," (e.g., does a turn follow the signal?), and "what leads," (e.g., did the signal take place before the turn?).

For the stops, we employed the Kase DevStops, a system that uses the reversals based on True Range to set stops. True Range is the maximum of the high minus the low, the previous close minus the high, or the low minus the previous close.

The warning line is set at the average two bar reversal and the three additional stops – Dev 1, Dev2 and Dev3 are set at levels around levels which represent one, two and three standard deviation reversals.

On ***Chart 2*** – July 2003 High Grade Copper – the four stops just noted are labeled in the circle marked "11." One can see that minor reversals test Dev1 or Dev2, while the major reversals tend to break Dev3, and the stops follow the market moves well.

In order to evaluate the performance of the indicators discussed, we set up daily data charts over a range of futures contracts data including cattle, coffee, corn, cotton, crude oil, gold, natural gas and the S&P 500 index. Altogether, our test was performed on 47,000 days of data, about 185 years in total.

Divergence signals were programmed on the traditional indicators and on the Kase indicators using the rules and guidelines outlined above relative to the proper mechanics of identification.

For the first part of the momentum performance study, we looked at which stops were hit following divergence.

Because two Kase indicators, the PeakOscillator and KCD, are always used together, we show their results along with the results of two traditional indicators – the Stochastic and MACD – which, when used in conjunction with one another, give the best results.

TABLE 1 Do Turns Follow Signals?

Stop Hit	Stochastic & MACD	Kase PeakOscillator & KCD	Improvement
Warning%	89	90	1
Dev1%	74	76	3
Dev2%	54	57	6
Dev3%	32	34	8

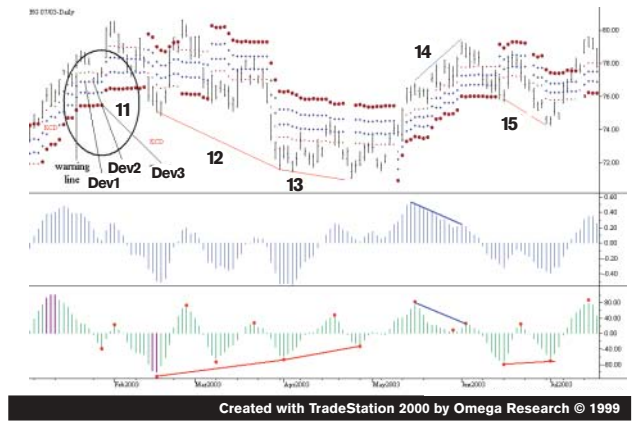
As ***Table 1*** illustrates, we found that relative to "what follows," the indicators work about the same. The Kase indicators result in an average improvement of about four percent, with the level of improvement increasing with the size of the reversal.

TABLE 2 Are Turns Preceded by Signals?

Stop Hit	Stochastic & MACD	Kase PeakOscillator & KCD	Improvement
Warning%	51	76	49
Dev1%	50	77	53
Dev2%	48	78	64
Dev3%	43	78	79

However, a huge difference is seen between the traditional indicators and the Kase indicators when we evaluate the data in the opposite direction, as to "what leads." The traditional indicators catch less than half of the market turns, and the Kase indicators catch more than three-quarters of them (***See Table 2***). There is an overall improvement of more than 60 percent, and the larger the reversal, the greater the level of improvement.

CHART 2 July 2003 High Grade Copper



If one were to use all three traditional indicators, the performance would be marginally better. The results would increase from an average of 48 percent of the turns caught to about 57 percent.

The Kase performance level of 78 percent is so high over the statistically significant sample of 47,000 days of test data used that even if one had managed to follow all three traditional indicators in addition to the Kase indicators, only a marginal improvement in performance, around 10 percent, would have resulted.

Chart 2 illustrates this point. The turns caught by both indicators are shown in blue, while those only caught by the KCD are shown in red.

12. The divergence labeled "12" was caught by the KCD when prices made a lower low and the indicator made a higher low. The MACD failed to catch it because it made a lower low. In this case, Dev1 was broken, and prices stalled right below Dev2.

13. The same is true of "13" as "12," and the market reversed well beyond Dev3 following that turn.

14. Both indicators exhibited a lower high when prices made a higher high and Dev3 was definitively broken thereafter.

15. After the decline that followed "14," the market turned back up, and that turn was caught by a higher low on the KCD that matched a lower low in price. The MACD failed to catch this turn that broke Dev3.

Kase and Company's research has shown that all of the momentum indicators studied are *great* at predicting turns, but of these, only the Kase indicators have worked well as a reliable *exit* system. Traditional indicators miss over half the turns, but Kase's catch more than three-quarters of them, illustrating the superiority of a momentum approach that is self-optimizing for the number of periods in the indicator and which adjusts for volatility.

Nevertheless, regardless of which set of momentum indicators traders choose to work with for exits, they can custom tailor their exit system to their particular risk appetite, based on the odds of hitting a stop once divergence takes place, per *Table 1*. If a trader were only willing to suffer a loss equivalent to the average two-bar reversal, he would exit a large portion of his trade, based on the warning line's hit rate of 90 percent. Those willing to hold a trade through a larger loss - say a two standard deviation move of the two-bar reversal Dev2 on Kase's stop system – could take 57 percent of profit when a divergence took place.

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Cynthia A. Kase is a master's level chemical engineer who worked in that field for the first ten years of her career and in 1983 was transferred into oil trading at Chevron. In late 1991, Kase took a one-year consulting assignment with the Saudi Oil Ministry after which she launched Kase and Company, Inc., which focuses on trading and hedging solutions for the energy sector. Interested traders can log on to ***www.kasestatware.com*** *for more on the indicators discussed in this article as well as information on how to obtain a working version for their trading use. She can be contacted at* ***kase@kaseco.com****.*