Multi-dimensional time trading

In the second of three articles, Cynthia Kase shows how an understanding of time — in more than one dimension — led to the development of a statistical screening system and a replacement for the MACD that employs random walk theory.

By Cynthia Kase

Generally, we can separate futures traders into two broad categories: fund or portfolio traders and single market traders. Fund managers improve profitability and limit risk by trading a group of commodities with low covariance, that is, through diversification. Many private traders and investors have neither the capital nor the time to trade multiple markets. Most corporate and institutional traders usually trade only one market — T-bonds or crude oil, for example. Here we'll present two indicators that improve accuracy and diminish risk by employing time diversification techniques.

In our discussion of the Dev-Stop (see "Putting The Odds On Your Side," *Futures*, April 1996), we showed how risk is dictated by the market and has nothing to do with what we can afford. Risk is related to volatility, which in turn is proportional to the square root of time. If we want to reduce risk, everything else being equal, we only can reduce our time frame or our volume.

A key point is that the market is fractally symmetrical. To illustrate this, I often use the analogy of the Russian doll — a doll that opens to reveal a smaller, but identical doll within, and so forth, until the doll is too small to break down. The market is the same: larger price waves consisting of progressively smaller price waves in shorter time frames.
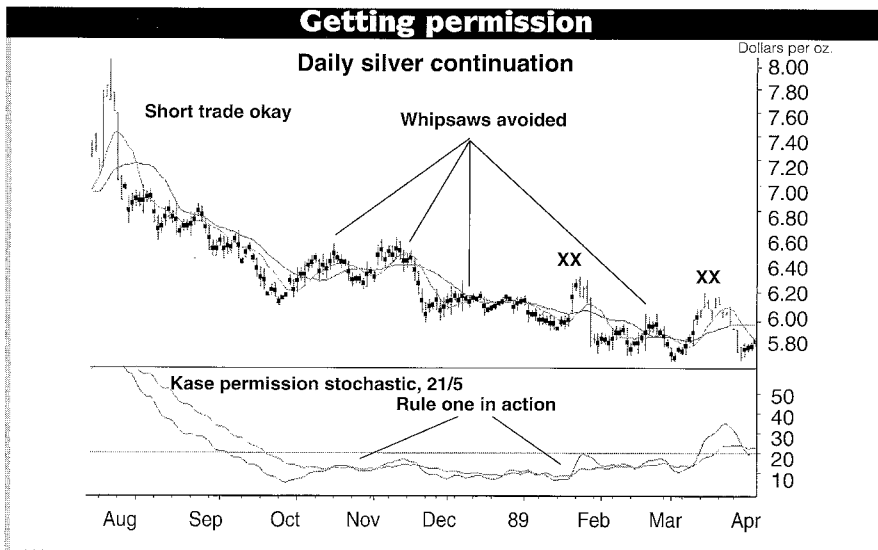
Permission slip Over a century ago, when trade was conducted on sailing ships, you could say that the further you were willing to venture and the more risks you were willing to take, the greater your potential reward. First, it would make sense to sail with the wind and in the direction of greatest reward. It also would make sense to build up a profit buffer in less risky ventures before attempting a major voyage. Trading is the same — we want to trade in the direction of the major trend and build profit in our trade in a low-risk environment before taking on additional risk with the expectation of further gains.

To accomplish this, we simultaneously trade multiple time frames, using the longer-term time frame to screen trades in the shorter time frame. For example, we can reduce by one-third our risk relative to a daily chart by trading in one-ninth of the daily time frame: For a market open six hours, we can trade a 45-minute chart, taking trades only in the direction of the trend evident on the daily. Once we have an established profit in our trade, we can move all or a portion of our position to a daily chart, using this profit as a buffer against the increased risk. If we lose, we only lose an amount equivalent to one-third of the daily.
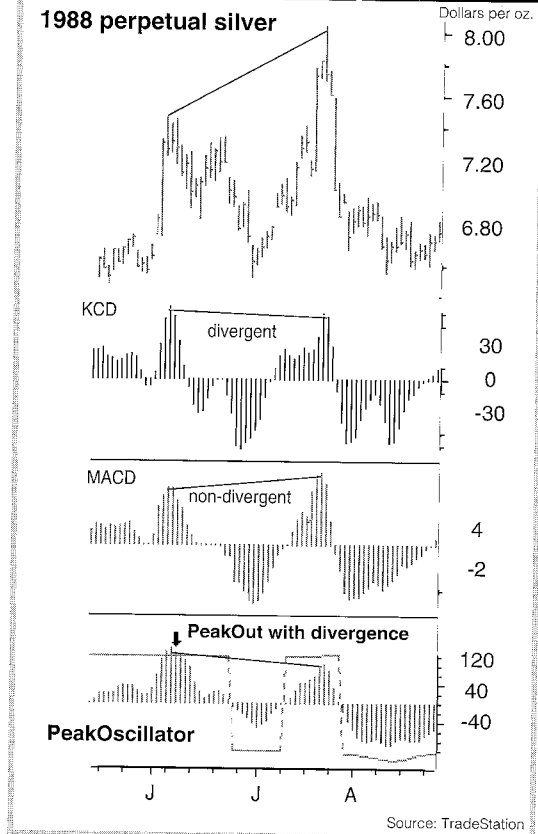
We can carry this further, for example, reducing risk by another third by entering the trade on a five-minute chart in the direction of the 45-minute trend, scaling up sequentially to the 45-minute and then the daily. We also can increase (scale up) the trade size as we receive signals on increasingly longer time frames.

Rudimentary techniques that require traders to watch multiple charts in different time frames — waiting for the completion of bars in the longer time frame to determine the major trend — have been sug-

Getting permission

Daily silver continuation

Dollars per oz.

Short trade okay   Whipsaws avoided

Kase permission stochastic, 21/5
Rule one in action

Aug   Sep   Oct   Nov   Dec   89   Feb   Mar   Apr

The Permission-Stochastic filter helps prevent countertrend whipsaw trades. Permission-Short bars in this bear market contain black dots.

1988 perpetual silver

Dollars per oz.

- 8.00
- 7.60
- 7.20
- 6.80

KCD
divergent
- 30
- 0
- -30

MACD
non-divergent
- 4
- -2

PeakOut with divergence
- 120
- 40
- -40

PeakOscillator

J   J   A

Source: TradeStation

The KCD and PeakOscillator give a bearish divergence signal missed by the MACD.

gested in the past. We have overcome the two drawbacks of this method — watching two charts and waiting for a bar to complete — through automation and simplification.

First, we redefine time. Going back to our earlier example, if we wish to filter a five-minute bar chart with signals from a 45-minute bar, we simply redefine 45 minutes as the 45-minute period ending at the conclusion of each five-minute bar. Thus we have a moving 45-minute window and do not have to wait for the completion of the bar.

This is done by defining the high of the larger bar as the highest high over nine five-minute bars, the low as the lowest low over the same period, the open as the open of the ninth bar back (O[8]) and the close as the close of the current bar (C[0]). We then can substitute our synthetic OHLC into any formula, such as the traditional slow stochastic (with the initial %K line and smoothed %D lines) to design a filter, with the provision that the resultant indicator usually must be smoothed to take out some of the

bumps caused by updating in shorter time increments. This is the math behind our Permission-K(PK), Permission-D(PD) and Permission Stochastic filters.

The next simplification step is to reduce the filter to either "long only" or "short only" signals by defining trade filter rules. We developed three simple rules for Permission-Long and their inverses for Permission-Short.

These are 1) when both the PK and PD are riding the top of the chart, and the difference between them is small (say, less than 2% to 5% — the exact variables would depend on the length of the indicator), 2) the PK and PD are in the neutral zone (for example, 20 to 80), and PK is above PD, or 3) when the PK is above the lower threshold, rising, and is substantially greater (at least 5% or more) than PD.

"Getting permission" (page 32) shows a bear market in silver with the Permission-Stochastic below. In this instance, rule one prevails for an extended period, a common phenomenon in trending markets: Momentum indicators tend to ride the top or bottom of the chart, staying in overbought or, in this case, oversold territory for extended periods. Contrary to popular myths about overbought or oversold markets, what is important is when the market exits these conditions, not that the condition itself exists (which is the reasoning for rule three).
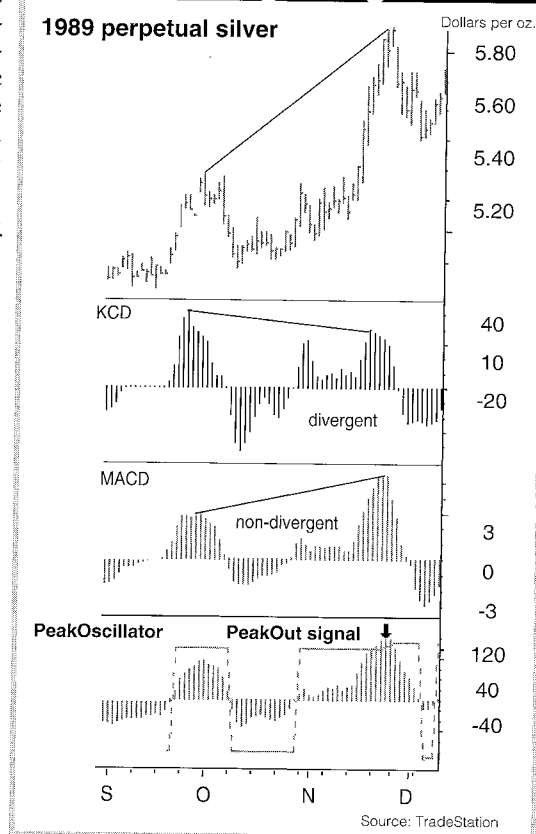
The result is binomial — we have only one of two outcomes — Permission-Long or Short. We can display the permission in a number of ways: as a histogram with one color for long and another for short, or with +1 for long and -1 for short, as a backdrop on the chart with one color for long and another for short, or we can color code bars. In this example,

we show Permission-Short as a black dot in the middle of the bar, and Permission-Long as blank.

Notice the majority of the bars contain a black dot throughout the bear market. Using a simple moving average (nine and 18 period) crossover system for timing market entry there are six long signals. Four signals are not "permissioned" and so the long whipsaw trades are avoided. (Applying other simple rules, for example, waiting for a second confirming signal to take a trade against the previous prevailing trend unless a spike top or bottom has occurred, would have screened out the two trades marked XX. If a new low is made following a buy signal, the next buy signal is again a first signal.)

Listening to CDs Another way we can diversify in time is by using integral calculus (it sounds complicated but it's not). Velocity is the first derivative of distance with respect to time, and acceleration the second ➠

1989 perpetual silver

Dollars per oz.

- 5.80
- 5.60
- 5.40
- 5.20

KCD
- 40
- 10
- -20
divergent

MACD
non-divergent
- 3
- 0
- -3

PeakOscillator   PeakOut signal
- 120
- 40
- -40

S   O   N   D

Source: TradeStation

The KCD divergence confirms the PeakOscillator's PeakOut signal prior to the sell-off.

➠ derivative. In the same way most so-called momentum indicators actually are rate-of-change or velocity indicators of some kind, where price substitutes for distance. Momentum is a misnomer in that in physics, momentum is the product of mass and velocity. Because popular "momentum" indicators generally do not include a "mass" term, velocity indicator, a first derivative of price relative to time, would be more accurate.

Acceleration is the derivative of velocity relative to time, or change in price relative to time squared. One such popular "momentum" indicator is the MACD.

Last month we discussed how substituting a statistical measure of trend in the form of revised random walk indexes for traditional moving averages in an oscillator (producing the PeakOscillator) is superior to traditional oscillators. Advantages are that it is normalized for volatility (and therefore universal), evaluates multiple cycle lengths and is more accurate due to the rigorous statistical measures underlying the mathe-matics. Similarly, substituting the indexes for moving averages in the MACD produces the superior KaseCD (KCD).

Just as the MACD in its popular histogram form is simply an exponential moving average oscillator less its own average, the KCD is the PeakOscillator less its own average.

KCD = average ((PeakOscillator) - average(PeakOscillator, 8),3);

Simply, it is more accurate, gives more reliable divergence signals, fewer false signals, produces clearer formations and is much more stable around the zero line.

By employing this "polished" acceleration indicator with the velocity-based PeakOscillator, in addition to a timing technique such as a simple moving average, we are evaluating price in three "dimensions:" on its own, with respect to time and with respect to time-squared. The odds of identifying possible market turns are thus improved.

"Silver setup" (page 33) shows the silver market peaking just prior to the onset of the bear market pictured in "Getting permission." The KCD shows a classic divergence while the MACD is non-divergent. The lower subgraph shows the PeakOscillator with a classic PeakOut signal followed by divergence. The PeakOut with divergence, confirmed by the divergent KCD, is a strong signal that the market may either be reversing or going into a corrective phase of reasonable magnitude.

Following the bottoming out in the late summer of 1988, the market corrected to the upside throughout the fall, peaking in late November (see "Confirming divergence," page 33). The KCD diverged, confirming a PeakOut signal, indicating a turn back into the bear market, while the traditional MACD was non-divergent.

Next month we'll show how to combine multi-dimensional statistical indicators using an actual trade.   **FM**

Cynthia Kase, author of Trading With the Odds, *is a trading and risk management advisor. E-mail: KASEandCo@aol.com.*