CHAPTER 5

# TECHNICAL ANALYSIS: ALTERNATIVES TO BAR CHARTS

Traders record market action in numerous ways and use numerous tools in managing a trading program. Bar charts are the most widely employed and widely watched alternative. Chapter 4 provided coverage of the bar chart and how it can be applied. But alternative tools are also widely used. The point-and-figure chart is a favorite approach of many traders and some traders use moving averages, a mathematical way to monitor the trends in the market. This chapter will explore selected alternatives to the bar chart and show how they can be used.

## POINT-AND-FIGURE CHARTS

A sketch of a point-and-figure chart is shown in Figure 5.1. There is only a price scale. The time calendar used at the bottom of the bar chart is missing. Advocates of this charting technique will argue that only price action, not time, is important.

The important parameters on the point-and-figure chart are the *cell size* and the *reversal requirements.* The cell size is simply the value, in terms of price increments, of each of the cells or "boxes" shown on the chart. The reversal requirement refers to the magnitude of price changes required before a reversal in direction of the price trend will be allowed.

How effective this charting approach turns out to be in signaling correct buy and sell decisions for a particular commodity depends on the choices of cell size and reversal requirements.

Figure 5.2 shows a point-and-figure chart for a hypothetical commodity with a cell size of 4 cents and a three-cell reversal requirement. Each cell in the chart has a value of $.04, and the price scale is therefore set in multiples of $.04. The Xs indicate higher prices; the Os indicate lower prices.

The patterns shown in the figure suggest what is needed to record a price reversal. If prices have been moving up and then start to decline, the price move down must be sufficient to allow the chartist to drop a cell and then fill at least three cells. If these conditions are not met, no reversal has been recorded. A column of Xs, which

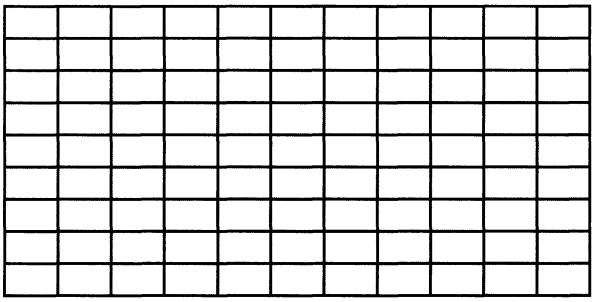



**FIGURE 5.1**
Demonstration of a Point-and-Figure Chart for Commodity Futures

denotes higher prices, must therefore always extend one cell higher than a subsequent column of Os, which denotes lower prices. That is what is meant by "dropping a cell." Also, note that the minimum number of Os (or Xs) shown is always three. This is more precisely what is meant by a three-cell reversal requirement.

More detail on how this somewhat different chart is developed is needed, of course. To start a point-and-figure chart, look at the trading range for a particular day and continue on subsequent days to watch until the daily trading range is sufficient to fill three cells. When this trading-range requirement is met, fill the three boxes with Xs if the close is above the midpoint of the trading range, with Os if the close is below the midpoint.

Call the first day that three or more Xs, for example, can be plotted day 1. On day 2, given that Xs for higher prices are being plotted, look only at the high for the day. If the high allows one or more higher price cells to be filled, plot the added Xs and ignore the low for the day. The daily trading highs can keep the price direction positive and bring the plotting of Xs as higher price cells are filled. Continue the process until, for example, the high on day 5 does not allow the plotting of at least one higher price cell. On day 5, look at the low and do nothing if the low is not sufficiently low to allow dropping one cell and then plotting at least three cells with Os to the downside. If several days pass with no price low sufficient to record a reversal, keep watching and resume the plotting of Xs when the high of a daily trading range finally allows the uptrend to be continued by plotting a new higher cell.

Eventually, of course, higher prices are not available and the reversal requirement will be met and the trend will turn lower as Os are plotted. Then, watch the daily lows and plot Os until the day occurs in which a new lower cell is not filled and the reversal requirement is met. Turn the plot back up and start recording a new column of Xs, denoting that the price direction has switched from down to up.

The procedure looks complicated at first, but it is really quite simple and offers a quick way to track the market. Keep in mind that

There is no time on the chart;

The choices of cell size and reversal requirement will determine the amount of action on the chart. Clearly, if a large cell size and a large reversal requirement are selected, there will be many days during which nothing is plotted; and

Only the highs and lows of the daily trading range are employed. Once the charting process is underway, the daily close or settlement price is not used.

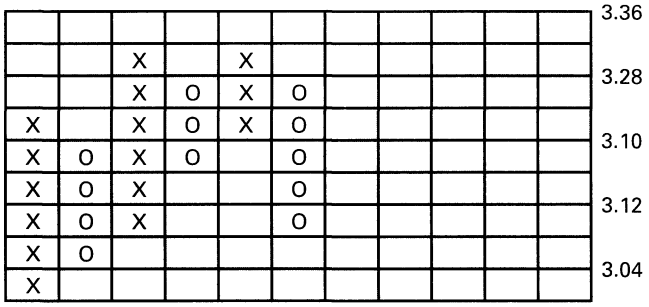



**FIGURE 5.2**
A Point-and-Figure Chart with a Three-Cell Reversal Requirement and a $.04 Cell Value

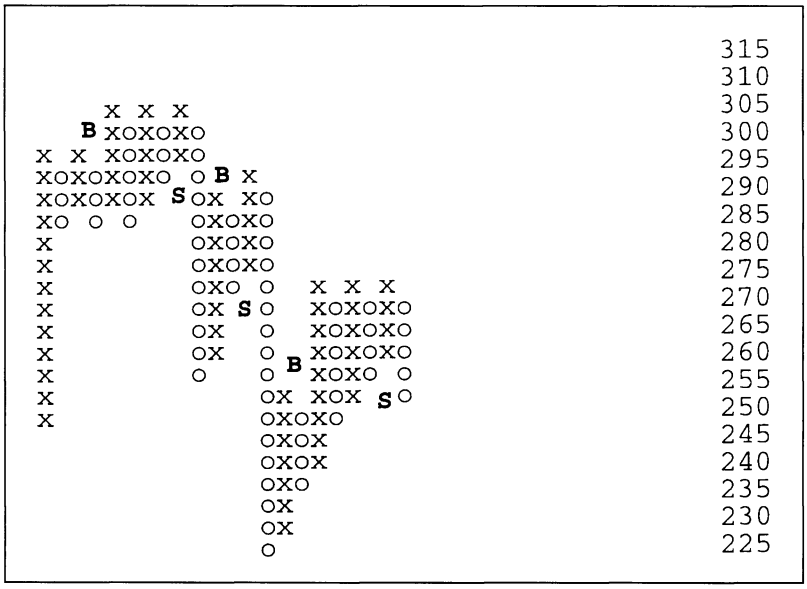
In the context of Figure 5.2, the initial surge in price (left side of graph) never generates a daily high that fills the $3.24 to $3.28 cell. A daily high of at least $3.28 would be required. As market action was monitored, the $3.28 was not reached, but a daily low of $3.08 or less was eventually observed. A daily low of $3.08 or less allows one cell to be dropped and three lower cells to be filled, meeting the reversal requirement. A daily low of $3.04 or less was also eventually observed, but a reversal to the upside was recorded before a low of $3.00 was recorded (the $3.00 to $3.04 cell was never filled). The plotting then continues in a like manner with a column of Xs representing a rising market, a column of Os representing a declining market. A single column could cover several days, or even weeks, of trading.[1]

Examination of Figures 5.3, 5.4, and 5.5 demonstrates the importance of the selection of the cell-size parameters. If there is a widely accepted practice on reversal requirements, it is a three-cell requirement. An entire book by Cohen listed in the references at the end of the chapter deals with the three-point reversal requirement in market analysis. Both Figures 5.4 and 5.5 use a three-cell reversal requirement, but the cell sizes are significantly different. Figure 5.4 uses a $.04 cell size and Figure 5.5 uses a $.02 cell size. Figure 5.3, of course, shows the conventional bar chart and allows comparisons of the two approaches to charting. Most modern computer software packages designed to allow analysis of the markets will let you try various combinations of cell size and reversal requirements. For a particular commodity, you will quickly find the set that seems to capture the significant moves in the market. As a rule of thumb, if you are getting reversals daily, the cell size and/or the reversal requirement may be too small. If you are getting only one reversal or less per week, the cell size and/or reversal requirement are too large.

[1]It might help you to recognize that examination of the chart in Figure 5.2 would enable us to conclude that (1) the initial price rally never reached $3.28; (2) the subsequent and first decline never reached $3.00; (3) the second price rally never reached $3.36; (4) the second price dip never reached $3.12; (5) the third rally never reached $3.36; and (6) the last price dip, when plotting was stopped, had not reached $3.04. Thinking through these "conclusions" should help clarify how the chart was plotted. Also, go back through the fact that before the first price rally reached $3.28, a low of at least $3.08 was recorded and a reversal was allowed. Then, before a price low of $3.00 or less was recorded, a price high of at least $3.20 was observed, a reversal was recorded, and the second price rally on the chart was underway.

**FIGURE 5.3**
Bar Chart for December 1997 Corn


**FIGURE 5.4**
Point-and-Figure Chart for December 1997 Corn with a $.04 Cell Size and a Three-Cell Reversal Requirement



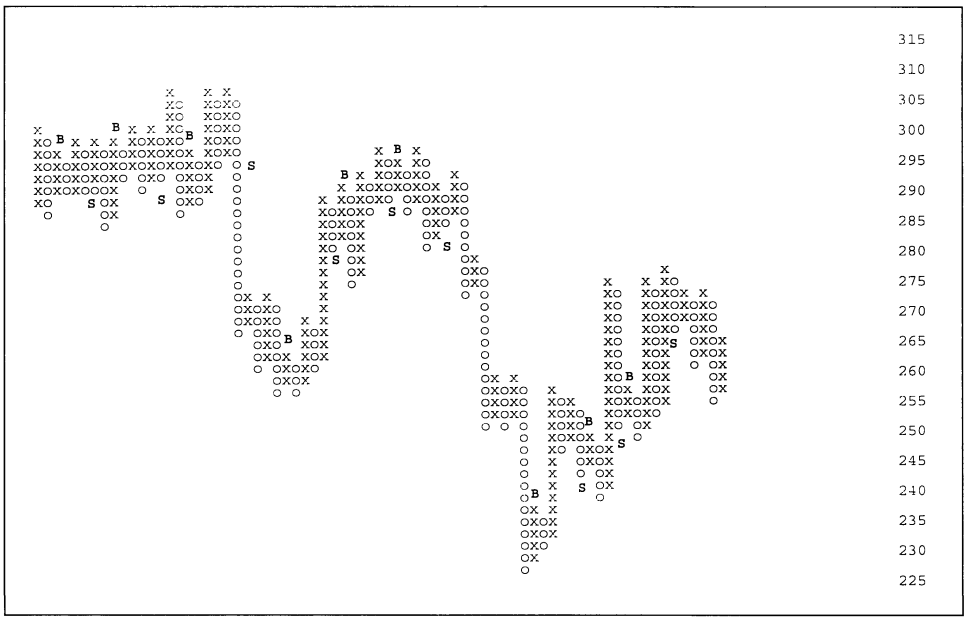



**FIGURE 5.5**
Point-and-Figure Chart for December 1997 Corn with a $.02 Cell Size and a Three-Cell Reversal Requirement

In the point-and-figure charting technique, a buy signal is generated when a market rally pushes a column of Xs above the previous column of Xs. A simple buy signal would therefore appear as follows:

```
O       X ← Buy
O X     X
O X O X
O X O X
O   O
```

Conversely, a sell signal occurs when the prices dip such that a column of Os moves below the minimum cell in the previous column of Os. A simple sell signal would thus be as follows:

```
O X     X
O X O X O
O X O X O
O X O   O
O       O ← Sell
```

Examination of Figure 5.4 indicates only three sell signals were generated during 1996 and into October of 1997. The first sell signal came in the fall months of 1996, during harvest, but the subsequent buy signal developed at a higher price. In a selective hedging program, this would have been a losing trade. The second and major sell signal occurred in April of 1997 when the topping action and price reversal shown on the bar chart (see Figure 5.3) developed. A third sell signal came in the early fall of 1997 when the prices dipped toward the $2.55 level.

Figure 5.5 shows a much more "active" chart. There were several sell signals during 1996 and a total of six during 1997. Even a cursory look suggests the $.02 cell size is the better choice if the charts are being used for a selective hedging program. The two completed round turns (sell and buy back) in Figure 5.4 would have essentially

broken even (depending on exact prices realized) after paying commissions. Picking up the signals in Figure 5.5 during 1996 as the industry came off the record 1995 and 1996 prices, a sell signal at $2.92 was bought back near $2.66—a futures gain of $.26. The two subsequent "round turns" both lost money, about $.23 in total. The next and major sell signal came in late spring of 1997, with a sell signal near $2.83 and a buy near $2.40—a gain of $.43. The later August round turn lost about $.13, and the sell signal in early September would have the producer short as harvest approached.

In net, before commission costs of $.04 to $.06 per bushel, the program gained some $.33. Note this is close to what the conservative hedger or cash contractor would have realized if he had sold near $3.00 back in April of 1997 and still had short futures positions (or cash contracts) with the market near $2.65 to $2.70 in September. But there is a big difference: producers following the point-and-figure signals will buy back the hedge positions and be out of futures and in a cash speculative mode if a major and unexpected move to the upside occurs.

*Figure 5.5 indicates the $.02 cell size would have been much more effective and the patterns also show the parallels between a point-and-figure chart with the correct parameters and the bar chart.* The first sell signal on the point-and-figure chart came when the market declined through the trend line near $3.00 on the bar chart, a signal in October of 1996. The second and major sell signal came in April of 1997, corollary to the break down through the steep uptrend line on the bar chart. If you had used this point-and-figure chart instead of trend lines in a selective hedging program, the results would be roughly comparable.

Figure 5.5 can be used to show a feature that shows an advantage of the point-and-figure chart. The point-and-figure chart provides a means of projecting the price move after a major signal is generated. Once a topping or bottoming pattern is identified, the projection rule is

$$PPRO = CV \times RR \times NC$$

where

*PPRO* = the price projection,
*CV* = value of each cell,
*RR* = reversal requirement in number of cells, and
*NC* = number of columns in the top or bottom formation.

Some judgment will be required, but the pattern on the corn chart suggests topping action near $3.00 in the spring of 1997, and a topping pattern that includes 16 columns. Using that and subtracting the projected distance *from the top of the formation* generates a price estimate of

$$\$3.00 - (\$.02 \times 3 \times 16) = \$2.04$$

The projection is below the plotted low price of about $2.26 shown in Figure 5.5, but the projection does indicate a major price break is imminent. The bottom that dipped down toward $2.25 has four columns, projecting up to $2.49, and the market reached that level before recording another bottom on the dip to $2.38. That seven-column formation projects up to $2.80, and the next rally came very close to the $2.80 level.

The point-and-figure chart also uses a version of the trend line that is so popular with users of the bar chart. But on this chart a 45-degree line is very important. Figure 5.6 demonstrates the use of a 45-degree line in an ascending market in the summer of

1997. Note the pattern of higher lows that traces out a 45-degree line. Once the reversal toward higher prices near $2.25 is recorded, the 45-degree line can be placed on the chart and extended to the upside. When a cell is filled below that extended 45-degree line, this action will be treated as a sell signal, much like the close below the trend line on the bar chart.

As noted earlier, experience with the point-and-figure charting suggests that if little plotting is done in a trading week and reversals occur only once every three to four weeks on average, the cell size is too large, the reversal requirement is too tough, or both complications are present. Conversely, if extensive plotting of new cells is occurring on a daily basis, and reversals are being recorded two to four times per week, the cell size is probably too small and/or the reversal requirement is too easy to meet. If the parameters don't fit the market, then the projections are also likely to be wrong much of the time. As noted earlier, there are many point-and-figure advocates who use a three-cell reversal requirement and who then adjust the cell size for different commodities. If a three-cell reversal requirement is being used, experience suggests cell sizes of $.02, $.02, and $.03–$.04 for corn, wheat, and soybeans, respectively, and a $.15–$.20 cell size for cattle (live and feeder) and for hogs.

A moment's further reflection suggests there are many parallels between the point-and-figure chart and the bar chart. Some were identified in the preceding discussion. The sell signal generated by a price dip on the point-and-figure chart would be a break through a support plane on the bar chart of the same futures contract. The buy signal generated by a column of Xs extending above the highest cell filled with an X in earlier columns is the same action that generates a move up through a resistance plane on a bar chart. Which chart a particular individual might use will be a matter of preference. Many traders use both and experiment with the parameters on the point-and-figure chart to find an effective combination. *You should be reminded again, however, that the bar chart is still the more widely used charting technique.* Buy or sell signals generated on the bar chart are likely to be more widely monitored than buy or sell signals on a point-and-figure chart.

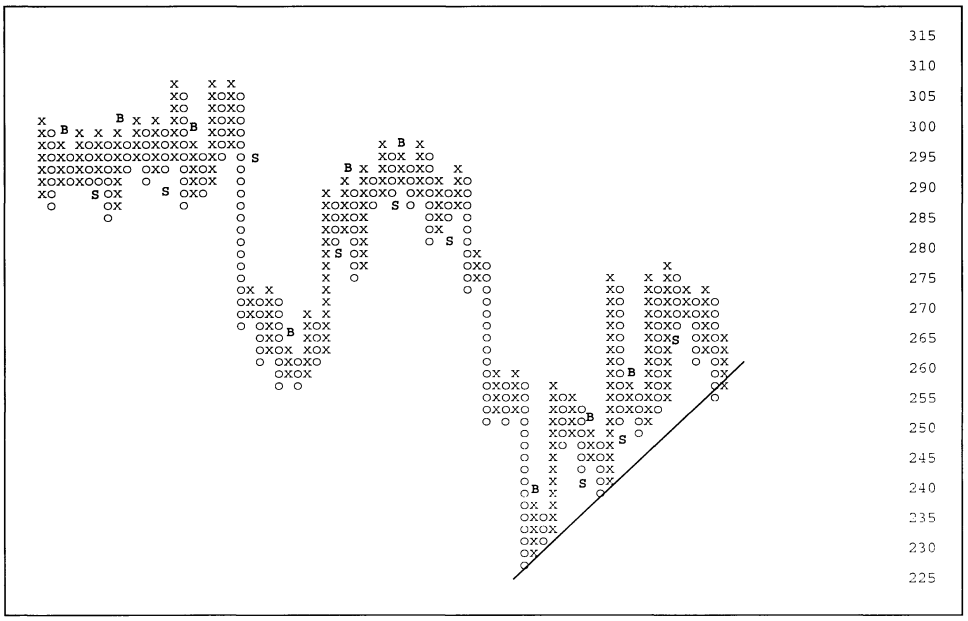



**FIGURE 5.6**
Use of the 45-Degree Line on the Point-and-Figure Chart

**The point-and-figure chart is an alternative to the bar chart. There is no time shown on the chart. Analysts often like the clear and unambiguous buy and sell signals on the chart and a convenient price projection technique is available. The choice of cell size and reversal parameters will be important determinants of the effectiveness of the charting technique for a particular commodity, and you will need to look at the literature for guidance and experiment with different combinations on your own.**

## MOVING AVERAGES

Moving averages are a simple means of monitoring market trends. A three-day moving average can be calculated by adding the last three daily closing prices and dividing by 3. A 10-day moving average is simply the sum of the last 10 closing prices divided by 10. Each day, a new closing price can be added, the oldest close dropped, and new averages calculated. Modern charting packages, offered by advisory services and private distributors, have provisions that allow moving averages to be updated daily electronically. Many have the capability of plotting the moving averages on the computer screen, printing them either superimposed over the bar chart, or in a new chart "window" immediately above or below the bar chart plot.

The choice of what type of moving average system will be used will largely determine whether it is a complement to the bar chart or an alternative to chart analysis. *Moving averages in some form or type of application are used by a significant percentage of commodity traders.*

Many traders and market analysts use a single moving average, such as a 40-day or a 50-day moving average of closing prices, to help monitor the direction of trend in the market and to signal a trend reversal. This type of application can be complementary to bar chart analysis. When a topping action, for example, is seen on the bar chart and the long-term moving average stops increasing and turns down, the two developments tend to reinforce each other. The bar chart topping pattern is suggesting a reversal of price direction and the change in direction of the long-term moving average is suggesting the same thing. In some instances, the moving average turns down before a chart top is apparent and the analyst then begins to anticipate some type of topping action on the bar chart. In other cases, what looks like a top or bottom on the chart may never be confirmed by the moving average, and some analysts will then ignore the chart pattern as long as it is not confirmed by a change in the direction of movement in the moving average. *These types of uses of moving averages are largely a complement to bar chart analysis.*

Some traders use the price action relative to the long-term moving averages as a sell or buy signal. For example, a closing price that is below the 50-day moving average after a sustained period of higher prices is seen as a sell signal. A close above the average after a downtrend would be seen as a buy signal or, at a minimum, suggest that the trend in price is turning from down to up. Figure 5.7 shows a decisive close below a 50-day moving average on the 1996 corn chart during July. During August, this volatile and record-setting market showed closes back above the average, and some users would have lifted short positions. The short positions would have been restored later in September!

The more widely employed strategy using moving-average systems becomes an alternative to, or replacement of, bar chart analysis. In this type of usage, two moving

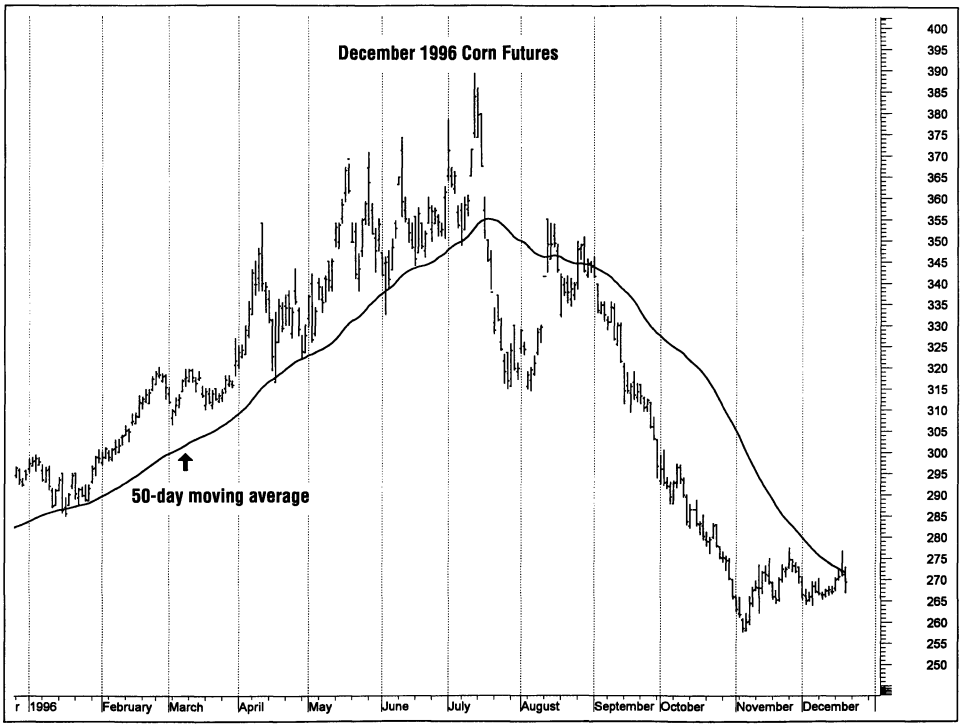



**FIGURE 5.7**
Use of the 50-Day Moving Average on the December 1996 Corn Futures Chart

averages are often employed and crossover action is used to generate buy and sell signals. Buy or sell signals are generated when one moving average crosses the second and a market bottom or market top is being confirmed.

Table 5.1 demonstrates with 3-day and 10-day moving averages. Conceptually, the idea is that in an upward- or downward-trending market, the shorter moving average tends to move faster and "leads" the longer average. When the market turns, the shorter average turns more quickly and crosses the longer and slower-moving average. It is this crossover action that generates the buy and sell signals. In the context of Table 5.1, a sell signal is generated the day the hog futures contract closes at $54.70 (the 12th entry in the "closing price" column) and the 3-day moving average drops below the 10-day moving average. Nine days later, with the closing price at $55.00, a buy signal is generated when the 3-day average moves back above the 10-day average.

Such a system of moving averages becomes a trend-following technique. *The market has to actually record a top or bottom and reverse direction before the moving averages will cross.* Trades will never occur at the exact price highs and lows for the year, and you must understand what the averages can and cannot do. The use of averages *can* impose a type of discipline to the trading program if you, whether hedger or speculator, cannot otherwise bring discipline to your program. The averages *cannot*, most informed observers would agree, outperform experienced bar chart analysts who handle their programs with discipline.

By observing the buy and sell signals in Table 5.1, you can, as a hedger, employ the moving averages in a selective hedging program. The sell and buy signals are clear and require no judgment. And, depending on the type of market behavior that develops, moving averages can be very effective as guides to selective hedging or to speculative programs.

**TABLE 5.1**
Demonstration of 3- and 10-Day Moving Averages for Lean Hog Futures: Calculations and Buy-Sell Signals

| Closing Price | 3-Day Moving Total | 3-Day Moving Average | 10-Day Moving Total | 10-Day Moving Average | Signal |
|---|---|---|---|---|---|
| $54.10 | | | | | |
| 54.75 | | | | | |
| 54.90 | 163.75 | 54.58 | | | |
| 55.30 | 164.95 | 54.98 | | | |
| 55.65 | 165.85 | 55.28 | | | |
| 56.00 | 166.95 | 55.65 | | | |
| 56.10 | 167.75 | 55.92 | | | |
| 55.80 | 167.90 | 55.97 | | | |
| 56.05 | 167.95 | 55.98 | | | |
| 55.60 | 167.45 | 55.81 | 554.25 | 55.43 | |
| 55.10 | 166.75 | 55.58 | 555.25 | 55.53 | |
| 54.70 | 165.40 | ***55.13*** | 555.20 | ***55.52*** | Sell |
| 54.10 | 163.90 | 54.63 | 554.40 | 55.44 | |
| 54.20 | 163.00 | 54.33 | 553.30 | 55.33 | |
| 53.60 | 161.90 | 53.97 | 551.25 | 55.13 | |
| 53.10 | 160.90 | 53.63 | 548.35 | 54.84 | |
| 52.90 | 159.60 | 53.20 | 545.15 | 54.52 | |
| 53.20 | 159.20 | 53.07 | 542.55 | 54.26 | |
| 53.90 | 160.00 | 53.33 | 540.40 | 54.04 | |
| 54.40 | 161.50 | 53.83 | 539.20 | 53.92 | |
| 55.00 | 163.30 | ***54.43*** | 539.10 | ***53.91*** | Buy |
| 55.10 | 164.50 | 54.83 | 539.50 | 53.95 | |
| 54.90 | 165.00 | 55.00 | 540.30 | 54.03 | |
| 55.50 | 165.50 | 55.17 | 541.60 | 54.16 | |
| 55.90 | 166.30 | 55.43 | 543.90 | 54.39 | |

Management of orders to enter and exit the market is important. Market actions can be taken either the day the averages cross or the next trading day. If the 3-day moving average is moving lower and approaching the 10-day average, it is easy to calculate what closing price would prompt "crossover" action and a sell signal on any particular day. A *sell-stop-close-only order* placed at or just below the closing price needed to prompt the crossing action and generate the sell signal would place the short hedge or short speculative position the day the averages cross and the signal occurs. Alternatively, a *limit-price order* can be placed the next day. Long observation suggests there is very little difference in the effectiveness of the moving-average program due to which approach is used in placement of orders. On exchanges that do not accept stop-close-only orders, the order will need to be placed the next day, or the broker can be instructed to use limit-price or *market orders* near the close on the day the crossing action is imminent.

Moving averages work best in a market that presents major and sustained price trends. *When a major price move develops, the moving average system is extremely effective because (1) there will never be a major and sustained downward trend during which the short hedger is caught totally without protection, and (2) there will never be a major and sustained upward trend during which the selective short hedger is not out of the futures market and enjoying the benefits of being a cash market speculator.* Obviously, the same benefits are there for the long hedger. Dur-

ing major price moves up, the long hedger *will be protected against much of the increase in costs*. A corn user, for example, would never be caught unprotected during the long and sustained move to record high corn prices in 1995 and 1996.

*Moving averages do not work well in choppy markets that show no sustained price trends.* Frequent buy–sell signals may be generated, and the typically small losses on such trades may accumulate to very significant levels if the choppy patterns continue. Critics also point to the tendency for moving averages to see the consolidation patterns in upward-trending markets as tops, signaling short hedges prematurely that must subsequently be lifted at losses.

Figure 5.8 demonstrates the tendency for moving averages to signal a premature top, but it also shows the strength of the moving-average approach. Early in calendar year 1996, the 9- and 18-day moving averages generated sell and subsequent buy signals on December 1996 corn that amounted to very little in terms of losses or gains. Note the sell signals in January, March, late April, and early June when the 9-day average dipped below the 18-day average. A selective hedger following the moving-average signals would have placed short hedges on several occasions. The short hedges would have been typically lifted at a break-even or small loss less the costs of the round turn trade in futures. This is the type of action many critics point to in a choppy market where there are no sustained price moves or in a market that is trending higher (like the December 1996 corn) and working through periodic congestion areas.

In July, a sell signal was generated and the strengths of the moving-average approach started to emerge. The sell signal was well below the high in this volatile market, and the short position was lifted during August at essentially a break-even level. But a sell signal was generated near $3.40 in early September, and the short position was not lifted until mid-November near the $2.70 level. That round turn

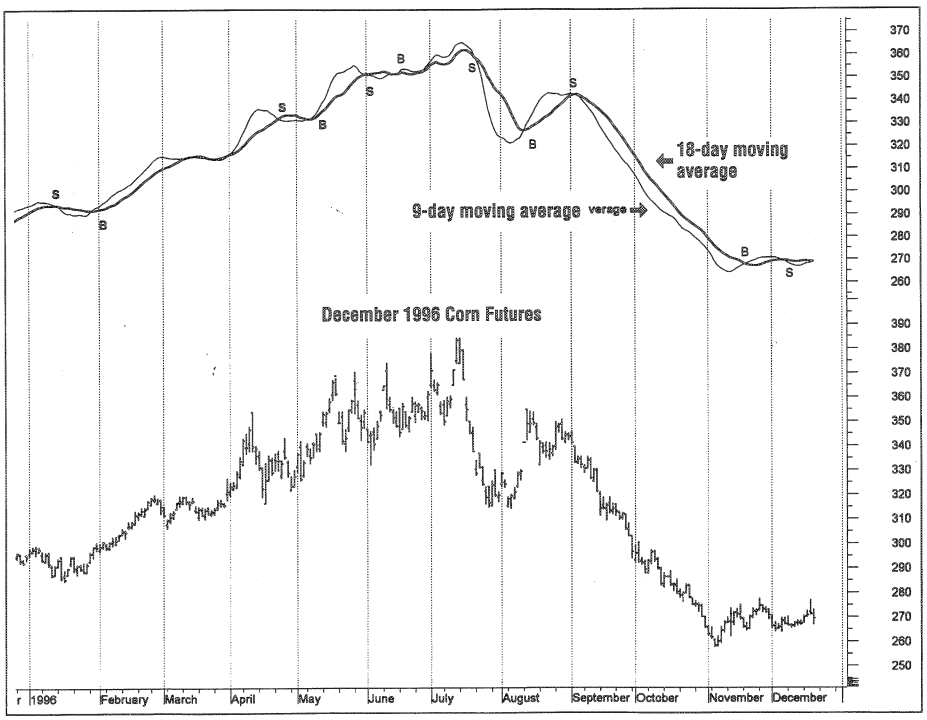



**FIGURE 5.8**
Bar Chart and Performance of 9- and 18-day Moving Averages for December 1996 Corn Futures

grossed $.70, putting the net price well above $3.00 depending on the cash-futures basis level employed.

An uptrend line on the bar chart would have generated a sell signal near $3.50, but the August action would have bothered some chart readers. Do you lift the short hedges? A late-August buy signal would have been seen if you hook a trend line to the contract high and to the early to mid-August price rally. If short positions were lifted, do you have enough discipline to replace them later? Either a short-term uptrend line in August or the break through the early August lows would have generated sell signals. ***But it takes discipline to replace those short positions***, and not all chart users would have followed through to that extent. The moving averages would put you short again in September and protect against that price plunge that was nearly $1.00 per bushel.

In a market that is trending strongly higher, a selective short hedging program based on moving averages is likely to *lose* money in the futures account. ***The strong point of the systems is that they allow the selective hedger to benefit from most of the increase in the markets by not having short hedges in place.*** This involves managing exposure to price risk, and you will recognize there are times when you want to be a cash market speculator since you can then benefit, as a seller, from upward-trending cash prices. That is the idea in selective hedging.

Figures 5.9 and 5.10 show that the choice of moving averages is important. The averages track the December 1997 corn through 1996, a period in which a producer of corn might have been interested in extending price protection into a 1997 crop that had not been planted. Remember, prices were at record highs *during* 1996.

Figure 5.9 shows the 9- and 18-day moving averages. Look carefully at the choppy price action during March to August of 1996. The 9/18 combination is slow to gener-

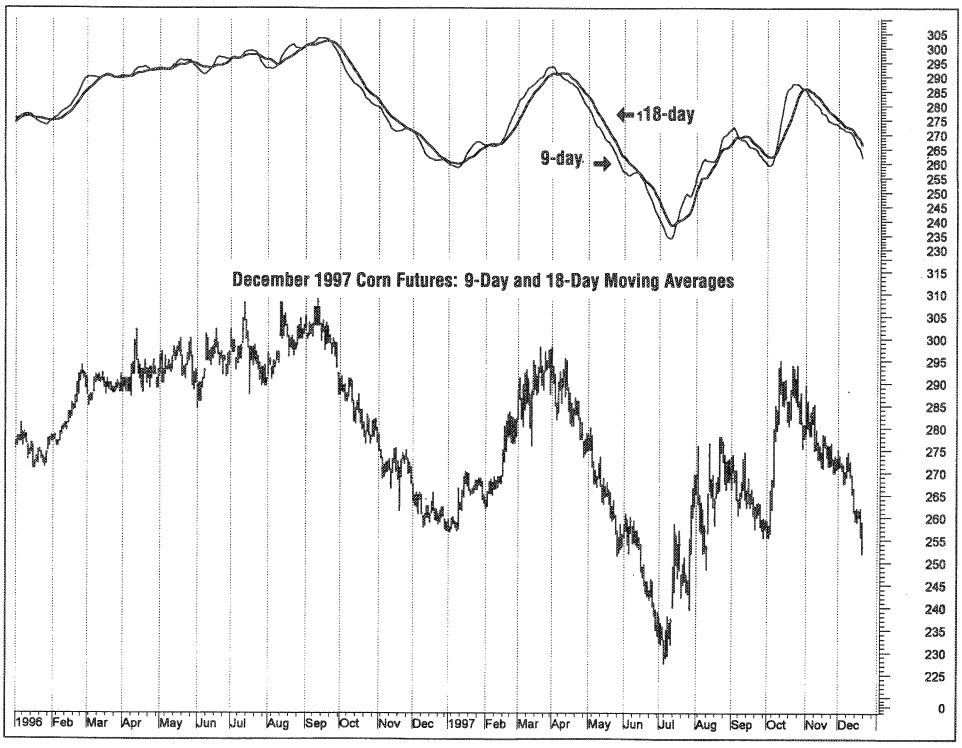



**FIGURE 5.9**
Bar Chart and Performance of 9- and 18-Day Moving Averages for December 1997 Corn

ate signals and will have trouble in this type of market. Note that the late May sell signal would have generated short positions that were bought back at a substantial loss in mid-June. The same thing happened again in late July and early August. Throughout this period, losses would have accumulated in the futures account.

The 4 and 9 combination in Figure 5.10 handled this choppy market much better. The mid-May sell signal and short positions would have been bought back at a break-even or better price in early June. The mid-July sell signal—coming several days earlier than the sell signal using the 9 and 18—would have been offset near August 1 at a profit.

*Perhaps the most appealing feature of the moving-average approach to selective hedging is the tendency for such systems to reduce the variability in the net revenue flow to users without significant reductions in the mean level of revenue over time.* In many instances, research has shown that the optimum set of moving averages can both reduce revenue variability *and* increase mean returns over time.

An example of the potential is shown in the work by Sronce and Franzmann at Oklahoma State. Employing both a third moving average to confirm buy–sell signals and a penetration rule—extensions discussed in Appendix 5A—the authors concluded that the moving-average strategies increased mean net returns *and* decreased the variability of net returns for hog producers. Miyat and McLemore, working with feeder cattle, reached essentially the same conclusion from research done in Tennessee. A number of other research efforts show the same results on other commodities.

In closing discussion on moving averages, three added thoughts are worthy of mention. First, we need to keep in mind that the effectiveness of moving averages is always tested on historical data. *There is no guarantee that the averages will be equally effective in the future.*

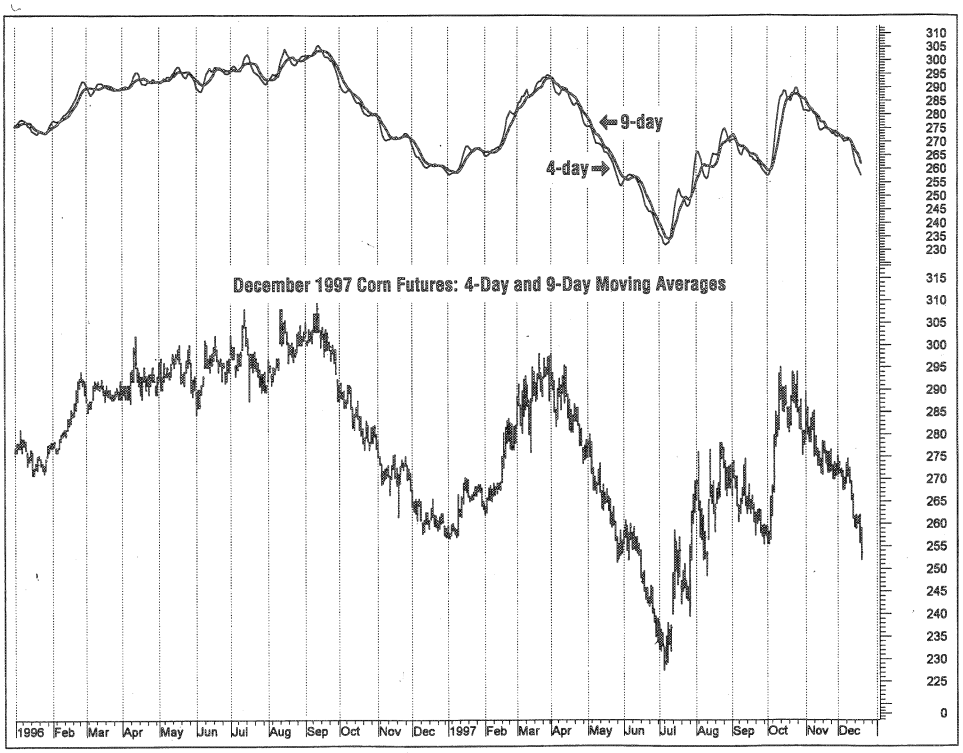



**FIGURE 5.10**
Bar Chart and Performance of 4- and 9-Day Moving Averages for December 1997 Corn

The second observation is related to the first. Over the past 20 years, analysis of the effectiveness of moving averages has been periodically updated by various researchers. *It is encouraging to note that the optimum set of moving averages in one period often performs equally as well or nearly as well in later periods.* That result suggests the averages that worked well across the past few years are likely to work well in the future. Conceptually, you would expect this to be the case unless the price action in the particular commodity changes significantly in terms of frequency and amplitude of price moves.

The third thought revolves around the need for you as a potential user to investigate moving averages, see if they fit your prevailing program and needs, and then make a commitment to the system. *If you tend to override the signals from the moving averages, then you should not use moving averages.* You have to "stay with" a moving-average strategy and give it a chance to work over time.

A number of modifications have been generated to improve the performance of the moving-average systems that employ crossover action to generate signals. One widely observed adjustment is the use of a third or leading moving average to confirm the sell–buy signals. Commodity Price Charts, for example, a widely distributed commercial charting service, shows a 4-9-18 combination. The 9-day and 18-day averages generate the signals, but they must be confirmed by the 4-day leading the 9-day up (down) the day the buy (sell) signal is generated by crossover action involving the 9- and 18-day averages.

Other analysts use optimized sets of moving averages, arguing quite logically that the market patterns vary from commodity to commodity and that no one set of moving averages will work for all commodities. If you wish to pursue this area still further, there are references at the end of the chapter. Appendix 5A extends the discussion concerning the correct set of moving averages and what modifications might help improve the performance of any selected set of averages. Neither the references nor the extended discussions are necessary conditions to moving to later chapters. They are offered solely to allow you, if you get intrigued with the potential of moving averages—and they *are* intriguing—to pursue the area with some focus and direction.

**Moving averages can be complementary to the bar chart, but most traders see them as a replacement. In markets exhibiting sustained price trends, the averages can be very effective. In choppy markets with no major trends, moving averages will not work well. Users need to be aware of the strengths and weaknesses of these trend-following systems. Overall, the averages have the most potential for traders who otherwise cannot bring a disciplined approach to their trading activities, and that can be a powerful advantage.**

## SUMMARY

Among the alternatives to the bar chart, the *point-and-figure* chart is preferred by some traders because it generates clear and unambiguous buy–sell signals. It is easy to update and offers a price projection alternative whenever a top or bottom formation develops. The point-and-figure chart is essentially an alternative to the bar chart and offers few dimensions that could be seen as complementary to the bar chart. The choice of *cell size* and *reversal requirement* will be the key to the effectiveness of the point-and-figure charting technique.

The *moving averages* can be complementary to the bar chart, or they can be a replacement. A single moving average may be used to confirm trends or to signal changes in the trend that is visible on the bar chart. The more widely used application of moving averages involves two averages that are used to generate buy and sell signals via crossover action.

*Which moving averages are employed will be important.* Moving averages will seldom be effective in a choppy and sideways market, and they have a tendency to signal tops or bottoms when a consolidation pattern is developing. In selecting the length of the moving averages to be employed, the need is for a compromise between being responsive to market moves and avoiding the quick reactions that generate premature and incorrect signals. The *best averages will vary across commodities,* and no one set will be best for every commodity.

The primary advantage of moving averages is that they bring a kind of discipline to what might otherwise be undisciplined programs. In major trending markets where a user's emotions tend to get in the way, the moving averages are at their best. The *producer will never be totally unprotected during a major price decline, and the commodity user will never be totally unprotected during a major cost increase when moving averages are employed.* The averages can be a very effective guide to a selective short hedging or selective long hedging program.

## KEY POINTS

- *The point-and-figure chart* is an alternative to the bar chart; it gives clear buy and sell signals and offers a price projection opportunity.
- How effective the point-and-figure chart will be will vary with the *cell size and reversal requirement* employed.
- A simple *moving average* is often used in monitoring *direction of price trend* in spotting changes in trend direction. As such, the use of moving averages is *complementary* to the bar chart.
- The most widely employed moving-average strategies use *two averages* that generate buy and sell signals via *crossover actions.* Moving averages used in this way are essentially an alternative to the bar chart.
- Moving averages are *not effective in choppy markets* that show no sustained price trends.
- *Moving averages* have a tendency to treat a consolidation pattern as a top or bottom, and this tendency *generates premature buy and sell signals.*
- The correct choice of moving averages will *vary with the commodity.*
- Moving averages have the potential of *bringing discipline* to otherwise undisciplined trading programs, and they can be *effective guides to selective hedging* programs. The moving averages will *provide protection against much of any sustained price move.*

## USEFUL REFERENCES

W. A. Cohen. *How to Use the Three-Point Reversal Method of Point and Figure Stock Market Trading,* 5th ed., Chartcraft, Larchmont, New York, 1972. A detailed

treatment of the three-cell reversal requirement approach to analysis of the markets.

C. D. Miyat and D. L. McLemore. *An Evaluation of Hedging Strategies for Backgrounding Feeder Cattle in Tennessee,* Bulletin 607, Tennessee Ag. Exp. Station, February 1982. The reference explores various strategies and shows performance of moving averages.

Jack D. Schwager. *Technical Analysis,* John Wiley & Sons, New York, 1996. The author presents a brief treatment of a single moving average in Chapters 3 and 8 and a more sophisticated coverage in combination with oscillators in Chapter 15.

Phillip W. Sronce and J. R. Franzmann, *Hedging Slaughter Hogs with Moving Averages,* Bulletin B-768, Oklahoma Ag. Exp. Station, July 1983. Alternative moving averages are used and both leading averages and penetration rules are investigated.

Chicago Mercantile Exchange, *Trading Tactics,* CME, Chicago, 1986. Demonstrates moving averages and point-and-figure charts.

# APPENDIX 5A. MOVING AVERAGES: ADDED DISCUSSION, REFINEMENTS

As noted in the chapter discussion, the disadvantages of moving averages come from two primary sources. First, moving averages tend to signal a top too early. In an upward-trending market, the market will often show a consolidation pattern and then resume the upward trend. A bull flag, triangle, or a congestion area will often take several days to develop. In a system that uses two moving averages and relies on a crossover pattern for buy and sell signals, the moving averages may signal a top. The result is a placement of a short hedge in a selective hedging program. A few days later, if the upward trend resumes, a buy signal will be generated and the short hedge is lifted again—typically at a loss. The same thing happens when prices are trending lower. A bear flag might develop on the bar chart as a consolidation pattern emerges, but the moving averages might generate a buy signal and call it a bottom.

The second problem emerges during periods of choppy price action when there are no sustained price trends. Sell and buy signals may be generated as the congestion area or sideways trading pattern develops. Obviously, each of these trades could be a losing trade, and the user of moving averages can quickly become disenchanted.

The need is for an optimized set of moving averages that offers a compromise between the need for a system that (1) is sufficiently sensitive that it tracks the moves in the markets correctly, and (2) is not so sensitive that it gives frequent and premature signals. Based on research, experience, and observation, the following are crossover systems that appear to be effective for each of the commodities shown.

| Commodity | Moving Averages |
|---|---|
| Soybeans | 13–16 |
| Corn | 7–10 |
| Wheat | 4–9 |
| Cattle | 5–15 |
| Hogs | 7–10 |
| Feeder cattle | 4–8 |

There are no guarantees that these averages will work well in the future, but across historical data sets they typically perform better than a general set of averages such as 3–10 or 9–18 for the particular commodity listed. Since the frequency and amplitude of price undulations vary across commodities, it is logical to suspect that no single set of averages will work for all commodities. In general, the correct set of averages for each commodity will (1) generate fewer trades, and (2) avoid the mistakes of prematurely calling a top or bottom compared to a generic or general set of averages. You might want to start with the moving averages listed for each commodity and experiment with combinations near these in terms of length of averages.

Once a set of averages is selected for a particular commodity, several extensions or qualifications have a high probability of improving the performance of the averages selected. Most involve some type of confirmation for buy and sell signals that are generated.

A popular extension is to use a third moving average to confirm the signals generated by a base set of averages. For example, the widely watched 9–18 set of averages is often combined with a 4-day moving average to confirm the signals generated by the 9-day moving average crossing the 18-day average. Procedurally, any sell (buy)

signal generated by the 9-day average moving below (above) the 18-day average must be confirmed by leading action by the 4-day average. That is, the 9-day dropping below the 18-day average is confirmed as a sell signal if the 4-day leads or is below the 9-day when the sell signal is generated.

The use of a confirming average is especially helpful in an upward- or downward-trending market when the 9- and 18-day averages would otherwise signal a top or bottom that would, *ex post*, turn out to be just a consolidation pattern. The short and responsive 4-day moving average would turn up quickly as the consolidation pattern on a bar chart is completed and the upward price trend is resumed. If the 4-day average is above the 9-day when the 9-day dips below the 18-day moving average, the decision maker ignores the sell signal. Conversely, if the 4-day is below the 9-day average when a buy signal is generated by the 9-day moving above the 18-day moving average, the buy signal is ignored.

Using the third and more responsive moving average as a confirming or leading indicator will eliminate some of the mistakes generated by the base set of moving averages. The number of trades, and the possibility of losing trades, is reduced for both the consolidation patterns in trending markets and the sideways patterns that are often present when there are no major trends present. The tendency to signal tops or bottoms mistakenly during consolidation patterns is reduced and the possibility of frequent and losing trades during periods of choppy and sideways price patterns is reduced.

You are encouraged to investigate and experiment with various combinations in addition to the 4- 9- and 18-day moving average combination. Our experience indicates that using a 3-day confirming average, for example, will improve the performance of the 5- and 15-day moving averages for live cattle futures.

A second extension is to use a penetration rule. The idea is to ignore sell and buy signals unless the shortest average moves through the longer average by at least a predetermined amount.

Research in the use of penetration rules is sketchy and is still evolving. It appears, however, that a penetration rule of \$.0l–\$.02 in corn and wheat, up to \$.03 in soybeans, and \$.10–\$.15 per hundredweight in the livestock commodities will improve performance of the underlying moving averages. Sronce and Franzmann found \$.14 per hundredweight to be best for hogs in the work mentioned in the chapter and in the reference list at the end of the chapter.

To elaborate, assume the 7- and 10-day moving averages are being used for corn. The decision maker might adopt a rule that a sell signal will be honored only if the 7-day moving average drops below the 10-day average by at least 1 cent per bushel. For a buy signal, the 7-day would have to be above the 10-day by at least 1 cent.

The logic of penetration rules is apparent. In an upward-trending market, the 7-day might dip below the 10-day by a fraction of a cent per bushel and be there for only 1 to 2 days if a consolidation pattern is developing. Using the penetration rule will eliminate some of the mistakes the moving averages make by calling such a consolidation pattern a market top. A possible disadvantage, of course, is that when a top or bottom does in fact develop, actions in taking a short or long position or in offsetting an existing hedge can be delayed for one or more days waiting for the penetration requirement to be met. The result can be the establishing of short positions at prices lower than the prices the day the initial sell signal is generated, or higher prices than those for the day the initial buy signal was generated.

A third alternative, one that our personal experience suggests merits consideration, is to use the relative strength index (RSI) in combination with the moving averages. It is very possible that a buy signal is generated during the volatile action that

often characterizes topping action in the market, and the selective hedger would consider lifting short hedges in a seriously overbought market. The buy signal might come, for example, during a price surge that is accompanied by the divergent action by the RSI described in the chapter. If divergence between price action and the RSI is developing and/or if the RSI is above 70, the decision maker might reasonably ignore the buy signal generated by the moving averages and keep the short hedge or short position in place. If the RSI is below 30, indicating an oversold market, a sell signal from the moving averages would be ignored, of course.

An obvious positive dimension of using the RSI as a confirming indicator is the possible elimination of additional calculations. Many electronic market news services carry the 14-day RSI and update it after the close of trade each day. If there is easy access to the RSI, only the base set of moving averages need to be updated by the trader. Once familiarity with the averages is established, however, updating each day by hand or, preferably, by an electronic spreadsheet or other computerized routine is very simple and is not time consuming. Many of the more sophisticated electronic data services offer moving-average calculations and allow for some choice in the averages used.

Whatever the extension or refinement, it is important that the user adopt a system to the circumstances and *stick with the system.* Do not, for example, experiment with the size of the penetration rule during the decision period. At the end of the year or other decision period, more refinement might be considered—but not before.

Before leaving this subject area, it is worth emphasizing what moving averages can and cannot do for the decision maker. A system of moving averages generates clear and unambiguous buy–sell signals and thus eliminates the need to develop expertise in the art of chart reading. This may be especially appealing to selective hedgers who have trouble bringing discipline to their program. It can help them make decisions on when to place, offset, and replace hedges. And moving averages bring the huge benefit of ensuring that the hedge (whether short or long) will always be in place when major moves in the market occur that might bring financially ruinous pressure to the firm. Related, the hedges will never be in place when major and sustained moves develop that bring benefits to the firm from being in an unhedged or cash market speculative position.

When no sustained price trends are in place, however, the moving averages can tax the patience of even the most committed user. Frequent trades, incorrect buy–sell signals, and the losses that come with them can challenge both patience and the financial reserves of the firm for prolonged time periods. In the final analysis, you will have to decide whether the moving averages fit your management style and ability, financial position, and overall operation better than some alternative approach to price risk management. But don't take these systems lightly. Remember, they will *never* allow you to endure a major and sustained price break as a producer/seller or a major price rally as a user without protecting you for at least a substantial part of the price move. The record high grain prices in 1996 brought huge margin calls for short hedgers and essentially ruined some grain users, dairys, and poultry firms that were caught with no long hedges or other form of protection. Moving-average systems will *never* allow such extremes.