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The price of carcass beef is important. Not only is it important to the retailer to whom it is a resource cost and to the packing plant to whom it is a selling price but it is important also to the feedlot operator. The demand for slaughter cattle is a derived demand and, as such, is a function of the marginal productivity of the packing plant and the price of carcass beef. Feedlot operators, therefore, would find predictions of carcass price useful in assessing the demand for their product.

Estimating the price of carcass beef is no easy feat. The meat packing industry operates under an oligopolistic market structure. This economic structure poses difficult problems in price estimation. The "kinked" nature of the demand schedule results in a discontinuity in the marginal revenue schedule and consequently, the marginal cost schedule may shift without any resultant change in price.

Efforts to model econometrically this type of industry are met with extremely difficult problems. Reaction curves of individual

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firms are not likely to be known but, if so, are most probably held by such firms as privileged information. Even should such information be made available, aggregation presents a new set of difficult problems. A simulation approach does little to resolve these issues and such approaches are very costly.

Re-examining the problem, it can be noted that predictions involve the concepts of a change in price and the associated magnitude of that change. A related dimension is the timing of the change. An ideal prediction would consist of the direction, magnitude and time of the price change. In practice the ideal has been generally unattainable. For managerial purposes, not all three elements are of equal importance. Although there may be room for debate, a proper ranking in order of importance would appear to be 1) direction, 2) time, and 3) magnitude.

Some market analysts employ "technical analysis" to futures contract prices in an effort to forecast the direction of a price change as well as the magnitude of the change. Some techniques do not actually forecast, but merely indicate the direction and time at which a trend change is occurring. The methods employed are rooted in a philosophy that 1) the market detects and discounts all known and foreseeable fundamental information, 2) the market moves in trends, and 3) trends remain in effect until a reversal is signalled.

Use of the tools of technical analysis is widespread among individual traders, futures market fund managers and, brokerage firm research departments. Despite claims by random walk adherents, published research, where technical tools have been applied to both speculative and hedging transactions, continues to indicate positive

results. A search of the literature, however, failed to disclose any effort to apply technical analysis to cash prices.

A possible explanation as to why technical analysis has not been applied to cash markets is that this type of analysis may have been viewed as only applicable to speculative markets where emotions are an important part of the decisions resulting in a high level of volatility. Although not characterized by a great deal of emotionalism, the carcass market exhibits a high degree of volatility and, therefore, might lend itself to technical analysis.

The Methodology

Point-and-figure analysis has been one of the more popular tools of the market technicians. Point-and-figure charts are easy to construct and to use.[1] One reason for the popularity of the point-and-figure technique is that there is no room for misinterpretation. Another reason is the belief that certain formations are repetitive and contain forecasting implications.

The method applied in this investigation was to plot a point-and-figure chart using the daily price of Choice Grade carcass beef weighing 600-700 pounds as reported by the National Provisioner over the period January 3, 1977 through April 14, 1983. The plot employed a $1.00 box size and a one box reversal.

There exists a large number of point-and-figure formations upon which to estimate the magnitude of a price change. Interest here is

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[1] A brief explanation of the technique is contained in the Appendix. A more complete explanation can be found in Cohen, A., "The Chartcraft Method of Point-And-Figure Trading," Chartcraft, Larchmont, New York, 1960.

in the magnitude of the larger price moves so only Spread Triple Tops and Bottoms using a horizontal count will be investigated. An evaluation of the technique as a prediction of important trend changes will be undertaken also.

A price projection will be considered to have failed if the objective is not reached. A price projection will be considered to have failed also if a signal occurs either after the objective has been achieved or if the objective is reached within two squares ($2) of the signal. A price projection is considered to be a success if the objective is reached and more than two squares ($2) from the signal. A price projection is considered to be an unqualified success if the objective is reached and is within two squares of the projected price.

Projection Analysis Results

The analysis proceeds from the plot of the data in Figure 1. Over the historical period under examination, twenty-five Spread Triple Top and Bottom formations were identified. Of the twenty-five, nine were considered to be failures and five of these produced a signal within one or two boxes of the projected price.

Seven of the formations were classified as successes. In each of these seven instances the projected price was attained but a continuation of the move carried price well beyond the expected price. That is to say, if a projection were accurate, when the projected price is attained a reversal of some type would occur ordinarily. The reversal might result in the development of a new formation leading to a continuation of the move or it might result in the development of a

reversal formation. In each of these cases additional minor formations did result, but not in the immediate vicinity of the projected price.

The remaining nine formations were classified as unqualified successes. Of these nine, one projection was exceeded by two squares; six projections were exceeded by a single square; and, two projections were met exactly. In the final tally then, about one-third of the projections were considered to be unqualified successes, two-thirds were considered to have been some type of success while the remaining one-third were considered to have failed.

Trend Change Analysis

For reasons unspecified in the literature, point-and-figure analysts adhere rigidly to forty-five degree angles to depict trendlines. An examination of the plot gives some evidence that trendlines drawn at other angles may be significant and, perhaps, more significant than the forty-five degree angle. Nevertheless, the work reported here will conform to the accepted standard.

Since the peak in 1979, forty-five degree lines drawn from the support and resistance points have generally followed the seasonal patterns in carcass price. Peaks in price have occurred at or very close to the point at which the forty-five degree trendline intersected the resistance line. Seasonal lows were not well identified by this technique. This can be attributed partly to the fact that the seasonal peaks have been formed rather abruptly whereas when the seasonal lows are made considerable basing has occurred. Consequently, the lows are less well defined. This raises the

possibility that the lows are formed in the discontinuous portion of the marginal revenue schedule and the peaks formed in the vicinity of the "kink" in the marginal revenue schedule.

The data period chosen is too short to provide a valid analysis of an apparent longer term periodicity. The meager evidence suggests a period of close to two years. Without any sound reasons for such fluctuations, any conclusions must await tests over a longer historical period. It may well be that prices followed a seasonal pattern until 1977 when strong inflationary forces propelled prices to a new plateau and that a new inflationary surge could repeat the pattern.

Summary

Carcass beef prices are difficult to model and forecast in part because of the economic structure of the beef processing industry. Data availability and the nature of the revenue curves pose difficult estimation problems.

Futures market technicians have employed rather simplistic techniques to project future prices of futures market contracts and claim some modicum of success. One such technique is referred to as point-and-figure analysis. A search of the literature revealed no applications of point-and-figure analysis to the cash markets for agricultural products.

Data from January 1977 through mid-April 1982 were subjected to a point-and-figure analysis using a $1 box size and a one box reversal number. An analysis of the data was undertaken to test the ability of the point-and-figure technique to accurately project future prices of

Choice Grade 600-700 pound carcass beef and to test the ability of the technique to determine points of major changes in trend.

To test the projection potential of the technique only the Spread Triple Top and Bottom formations were employed. Price projections were based on the use of the horizontal count method as applied to the formations. Although some degree of success can be claimed for the technique, the results are not superior to the traditional statistical techniques and, in general, appear inferior.

Furthermore, the technique lacks information on one of the more important dimensions of a price forecast, the time at which the forecast can be expected to be realized without any compensating feature such as improved accuracy of the forecast.

A trend analysis based on the use of forty-five degree angle trendlines produced some unusual results in that seasonal peaks occurred in a remarkably consistent manner. However, seasonal lows could not be identified as readily and the length of the data series chosen for this preliminary analysis is insufficient to form conclusions with an acceptable degree of confidence.

While some additional testing of the technique may be warranted using a longer data series, the results produced in this study suggest that a significant advance in prediction of prices is unlikely to surface with this approach. The approach may have some value as a supplement to alternative price projection methods.

APPENDIX

Point-And-Figure Analysis Adopted to
Cash Price Series

Point-and-figure analysis is typically applied to price data generated in the securities and commodities markets and utilizes the high and low prices for each day. In the following, the procedure for developing the point-and-figure chart is modified to permit the use of a single price to be charted.

Charting

To illustrate the construction of a point-and-figure chart for carcass beef, consider the data below:

| Date	Price	Date	Price
12-13	$92.00	12-27	$94.00
12-14	90.00	12-28	94.00
12-15	90.00	12-29	94.00
12-16	91.00	12-30	92.00
12-17	91.00	--Market Closed--	
12-20	92.00	1-3	90.50
12-21	93.00	1-4	91.50
12-22	94.00	1-5	92.00
12-23	94.00	1-6	93.00
--Market Closed--		1-7	94.00
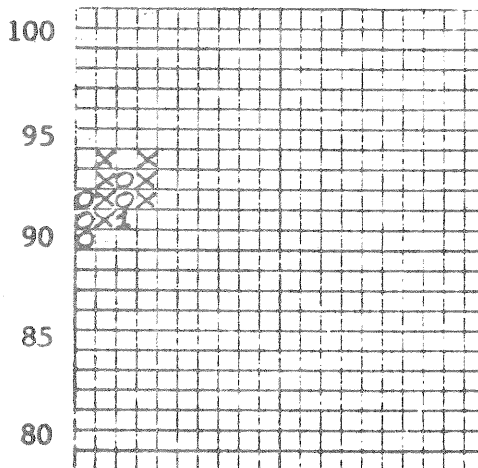
Using a piece of graph paper such as the K & E 46 0700 or 47 0700 10 X 10 to the inch, construct a price scale along the vertical axis, say, $10 to the inch. This means each box will have a value of $1.00. Starting with December 13 and 14 note that the market is declining and has declined by more than $1.00. (In this analysis a one box or $1.00 change in price -- up or down -- is sufficient to reverse the minor trend. The choice of the reversal number is at the discretion of the analyst as is the box size.) Therefore, using the convention of O for downtrends and X for uptrend, enter an O in the box representing $92, $91, and $90. On the 15th the price remained at $90 so no entry is made. On the 16th, however, the price rose to $91. Consequently, move one column to the right and enter an X in the box representing $91. On the 17th no entry is made. On the 20th enter an X in the $92 box; on the 21st an X in the $93 box; and, on the 22nd an X is placed in the $94 box. No entries are made until the 30th. On that date move one more column to the right and place an O in the $93 box and an O in the $92 box. On January 3rd instead of an O to represent the decline to the $91 box, enter a 1 in the $91 box to denote the change in month. The remainder of the data is plotted in a similar manner.

Patterns

Adherents to point-and-figure analysis believe that certain recognizable patterns are formed that repeat themselves and, in addition, foretell the future trend in price. A catalog of the formations can be found in The Chartcraft Method of Point-and-Figure Trading. The following figure is representative of the pattern labeled Spread Triple Top and Spread Triple Bottom. Penetration of

the row containing the X's at the same high level represents a breakout to the upside and is indicative of an increasing trend to ensue. Penetration of the row containing the three O's at the same low level represents a breakout to the downside and is indicative of a declining trend to ensue.

Spread Triple
Top
      Spread Triple
Bottom
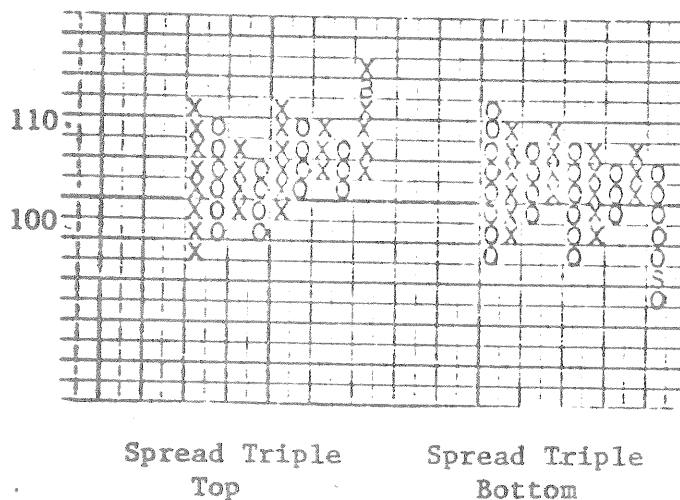
The Horizontal Count

The horizontal count can be illustrated through the use of the Spread Triple Top depicted above. The procedure is as follows: (Assume a box size of $2 and a reversal number of 2.) Count the number of boxes across the top of the formation -- in this case 9. Form the product of the number of columns in the width of the formation, the reversal number and the box size (9 X $2 X 2 = $36). Add this product to the lowest price in the formation ($100). The price is then projected to reach a target price of $136. An analogous procedure follows for the Spread Triple Bottom.

Box Size = 91.00
Reversal Number = 1

Box Size = $1.00
Reversal Number = 1