Farm, Wholesale, and Retail Beef Price Relationship[1]

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Summary

Analysis of weekly retail, wholesale, and farm beef price data indicated that a time lag exists between price changes at the various market levels. Farm-level slaughter cattle price changes typically lead wholesale beef price changes by 2 to 3 weeks. Similarly, wholesale beef price changes typically lead price changes at the retail level by 3 to 4 weeks.

Introduction

The temporal relationships among live, wholesale, and retail beef prices changes are important in effectively monitoring and analyzing the conduct and performance of the meat processing and retailing industry. Knowledge of how prices at the various market levels react to one another is useful for private as well as public policy decision making.

Frequently, in the short-term, cattle prices decline during periods when retail beef prices are not declining. This leads to a short-term increase in the farm-to-retail beef price margin. Similarly, when slaughter cattle prices are increasing, retail beef prices may not be increasing simultaneously, resulting in a temporary decline in the farm-to-retail price spread. Retail beef price patterns reflect wholesale prices of previous weeks, which in turn, are responding to changes in slaughter cattle prices of earlier weeks. Thus, prices at separate market levels on a given day do not reflect the same set of market information.

The time required to move beef from feedlots to retail shelves, including transporting, processing, and packaging, is one factor contributing to the lag in price response at the different market levels. However, attempts by retailers to curtail short-term price fluctuations at the retail level may also dampen the response. Retailers typically sell meat about a week after purchase. Since virtually no aging of beef occurs after slaughter, the physical process of transporting beef from the farm to the retail shelf typically takes less than 3 weeks. If retailers are using markup pricing, they will adjust retail prices to reflect changes in what they have to pay for meat at the wholesale level.

The objective of this study was to determine the typical lead-lag relationship between retail, wholesale, and farm beef prices. Knowledge of the typical lag length of price changes across market levels provides some explanation as to why the farm-

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to-retail beef price spread fluctuates during periods of volatile live cattle prices. In addition, knowledge of which market level's price is the leading indicator should help provide a grounds for price forecasting.

Procedure

The data analyzed in this study consisted of weekly prices for 900 to 1100 pound Dodge City slaughter steers, weekly Yellow Sheet (midwest river basis) prices for yield grade 3, 600-to 700-pound choice steer carcasses, and a composite weekly, weighted average, retail beef price. The retail prices were averages of 15 retail beef cut prices, weighted by their respective percentage volume of total retail cuts. The retail prices were an average of beef prices in nine major U.S. cities (Commodity News Services). The price data analyzed covered the January 1983 through December 1986 period.

Statistical analyses of the prices were performed to determine the approximate lead-lag relationships between the three market levels.

Results

A summary of the average retail, wholesale, and farm beef prices during the January 1983 through December 1986 period is reported in Table 23.1. The retail beef price averaged $180.09/cwt (retail weight), the wholesale price for yield grade, 3 600 to 700 pound, choice steer carcasses averaged $94.00/cwt (carcass weight), and the price for 900 to 1100 pound slaughter steers averaged $62.74/cwt (live weight). Although the retail price was the most volatile price in absolute dollars, with a standard deviation of $7.96/cwt, the retail price was the least variable when variation was expressed as a percentage of average price. For example, although the farm price standard deviation is just over half as large as the retail price standard deviation, indicating that the farm price is much less variable in absolute dollars, the retail price coefficient of variation is just over half as large as the farm price coefficient of variation. Therefore, when adjusted for the average price, the retail price is much less volatile in a relative sense than the wholesale and farm beef prices. The lower relative price variability at the retail level suggests that retailers do not change retail prices very quickly as prices at the lower market levels change. They are apparently able to exert some market power to maintain comparatively more stable retail beef prices.

A graph of the wholesale and farm prices is provided in Figure 23.1. Note that the two price series tend to follow the same general patterns. Statistical analyses, however, revealed that changes in the live slaughter steer price led changes in the wholesale carcass price by 2 to 3 weeks. That is, an increase in the price of slaughter steers this week (all else constant) generally will result in an increase in steer carcass prices over the next 2 to 3 weeks. In the short-run, no significant price influence was found from the wholesale price back to the farm price. This means that changes in the live slaughter steer price led to significant changes in carcass prices; however, carcass price changes did not systematically lead to short-run changes in farm prices.

The wholesale and retail price patterns are shown in figure 23.2. Once again, the retail and carcass prices tend to follow the same general patterns, though they do not visually match each other as closely as the farm and wholesale prices. Changes in the wholesale price typically led changes in the retail price by 3 to 4 weeks. That is, a decline in the wholesale price of beef this week (all else constant) would be expected to lead to a decline in the retail beef price over the next 3 to 4 weeks. In the short run, no significant price influence from the retail price back to the wholesale price was detected.

Implications

Cattle price changes at the farm level are reflected in the wholesale beef price after a 2 to 3 week lag, which in turn, is transmitted to the retail beef price in 3 to 4 weeks. This holds at least two significant implications for cattlemen. First, the retail beef price does not provide much information on the expected direction of future slaughter steer prices. The retail price appears to be responding to prices at the farm level of previous weeks and little new information on short-term price expectations is introduced at the retail level.

Second, short-term changes in the farm-to-retail price spread will occur simply as a result of changes in slaughter steer prices. During periods of increasing slaughter steer prices, the farm-to-retail price spread can be expected to decline, because the retail price generally does not increase as rapidly as the farm price. During periods of declining slaughter steer prices, the farm-to-retail price spread can be expected to increase as a result of the lagging response of retail prices to farm level price declines.

Table 23.1. Summary of Weekly Retail, Wholesale, and Farm Beef Prices, January 1983 through December 1986

Market Level	Average Price	Lowest Price	Highest Price	Standard Deviation	Coefficient of Variation
	----$/cwt----				
Retail[a]	$180.09	$161.40	$198.48	$7.96	4.42%
Wholesale[b]	94.00	76.00	108.50	7.19	7.65
Farm[c]	62.74	50.90	72.45	4.47	7.12

[a]Composite weighted average of 15 separate beef cut price in nine major US cities including Atlanta, Chicago, Houston, Kansas City, New York, Minneapolis, San Francisco, St. Louis, and Washington. Primary source Commodity News Service.

[b]Weekly Yellow Sheet midwest river basis price for yield grade, 3 600 to 700 pound, choice steer carcass. Source National Provisioner.

[c]Dodge City, Kansas Weekly price for 900 to 1100 pound, choice slaughter steers. Source USDA.
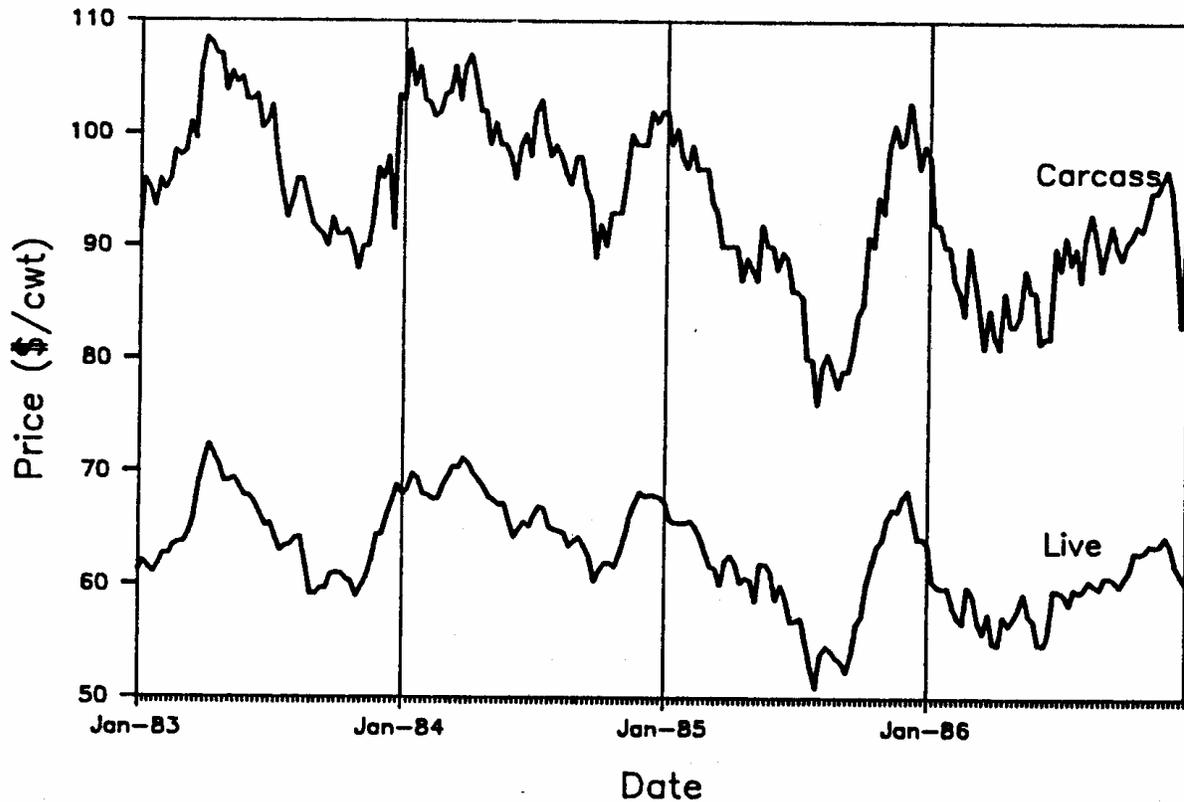
Figure 23.1. Weekly, Dodge City Slaughter Steer Price and Yellow Yield Grade 3 6/700 lb Steer Carcass Price, January, 1983 - December, 1986
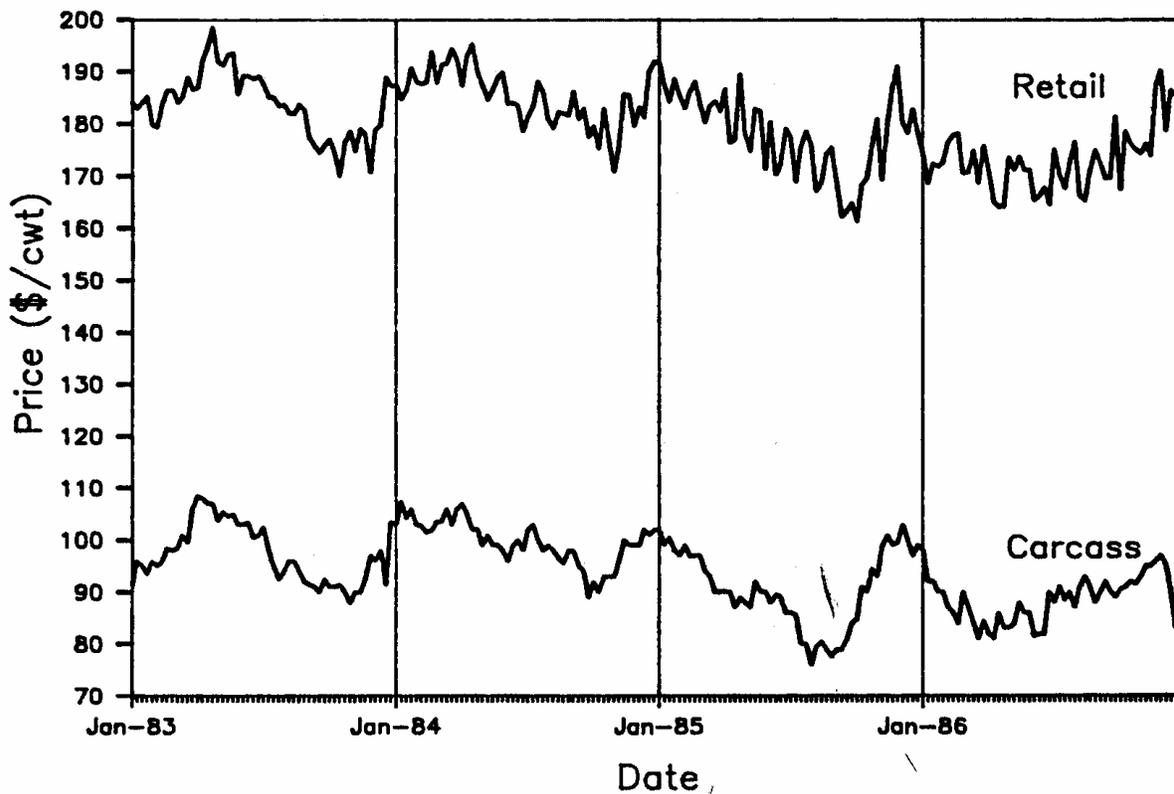

Figure 23.2. Weekly Yellow Sheet Yield Grade 3 6/700 lb Steer Carcass Price and Nine - City Average Retail Beef Price, January, 1983 - December, 1986