

Retailer Pricing Behavior

Analyzing retailer pricing behavior requires a skillful blend of data analysis, economic modeling, and institutional understanding. When asking if retailers exercise market power, one is asking if retailers are able to influence prices away from the perfectly competitive

level (see box, “Market Competitiveness”). In short, consumers would be paying prices in excess of those that would have prevailed under perfect competition, and retail suppliers would be receiving prices below those in a competitive market.

Market Competitiveness

Researchers use the perfectly competitive market as a benchmark for assessing the degree of firm market power. In this competitive market, price equals marginal production cost for each firm in the market. Thus, researchers typically try to measure the gap between prices and marginal cost when estimating the presence and the degree of firm market power. In industries where sellers have market power, firms charge consumers prices above marginal cost, while market power in buying is the ability to set prices paid to suppliers below marginal cost.

In a monopolistic market, one firm has complete control over setting the selling price. Industries with few firms (oligopolies) have some, but not total, market power, and thus the gap between price and marginal production cost will be smaller than in the monopoly case. The same principle applies when firms have market power in buying. When there is a single buyer in the market (monopsonist), it sets buying prices in the same way that a monopoly sets the selling price. When there are few buyers (oligopsonists), prices paid to suppliers will diverge from perfectly competitive prices by a smaller amount than in the monopsony case.

Exercise of either oligopoly or oligopsony power by retailers is harmful to shippers because both forms of market power reduce sales of the farm commodity through retail channels. Oligopoly power at retail results in prices set above the competitive level, which may reduce sales and divert product to alternative market outlets, such as foodservice. Oligopsony power in procurement reduces prices to shippers below the level that would prevail under competition. Oligopsony concerns are magnified in the produce sector because the selling side of some produce markets is unconcentrated relative to the buying side. In many cases, the highly perishable nature of produce makes supply at any point in time very unresponsive to price (Sexton and Zhang, 1996). There is more flexibility in semiperishable products that can be stored and marketed when prices are higher.

At a conceptual level, two basic factors give grocery retailers some degree of market power in selling, or influencing prices charged to consumers. First, because consumers are dispersed geographically and incur nontrivial transaction costs in traveling to and from stores, a typical store enjoys a modicum of market power over nearby consumers.⁵ Second, retailers can differentiate themselves (and thereby charge a premium) through the services they emphasize, advertising, and other marketing strategies. The question, thus, is not whether retailers have the ability to influence price, but, rather, the extent and implications of that influence.

⁵Market power due to location is inevitable when consumers are distributed geographically and incur nontrivial transportation costs. Even when large numbers of sellers exist in a market, any one seller competes actively with only its nearest rival(s). In the absence of barriers to their doing so, retailers will enter a geographic market until economic profits are driven to zero. Prices will exceed marginal costs on average, however, based upon the fixed costs of entry.

Retailer Market Power⁶

Oligopoly power in food retailing is not amenable to some methods used by economists to examine market power questions because modern groceries sell so many different products—an average of 40,000 or more items for U.S. supermarkets. To fully examine the market power of supermarkets, pricing behavior in the relevant markets would have to be estimated across all products. The structure-conduct-performance (SCP) approach, however, can be applied by aggregating prices into indices.⁷ These studies seek to explain grocery prices as a function of demand, cost, and market structure variables. Studies such as Hall et al. (1979), Lamm (1981), Newmark (1990), Marion et al. (1993), and Binkley and Connor (1998) have examined average retail food price relationships, using cities as the unit of observation.

Marion et al. (1979), Cotterill (1986), Kaufman and Handy (1989), Cotterill and Harper (1995), and Cotterill (1999) focused upon the behavior of individual stores, giving them the opportunity for increased precision and relevance in construction of explanatory variables relative to earlier studies. Cotterill (1986) studied food retailer monopoly power in Vermont, a sparsely populated State, and provided an almost ideal setting to delineate relevant geographic markets for identifying concentration. Concentration variables (four-firm and one-firm concentration rates and the Herfindahl index) were positively associated with price and were statistically significant.⁸ A parallel study of Arkansas supermarkets by Cotterill and Harper (1995) and Cotterill (1999) reached similar conclusions as to the impacts of retailer concentration on food prices.⁹ MacDonald (2000) argues that observed pricing patterns at retail for food items with a strong seasonal

⁶The material in this section draws heavily on two studies commissioned by ERS, which were conducted by Sexton et al. and Richards and Patterson.

⁷The structure-conduct-performance approach is an empirical methodology based upon a loose conceptual framework, which posits that conduct and, in turn, performance in an industry are determined by structural conditions in the industry, such as degree of concentration, entry barriers, and extent of product differentiation.

⁸Four-firm concentration ratio is the share of market sales made by the four largest sellers, one-firm concentration ratio is the share for the market leader, and the Herfindahl index is the sum of the squares of market shares for all sellers in the market.

⁹Studies conducted at the city level finding a positive structure-price relationship include Hall et al. (1979), Lamm (1981), and Marion et al. (1993).

component are consistent with models of oligopoly rivalry among retailers.

However, not all studies of grocery retailing have found a positive association between concentration and price. Kaufman and Handy (1989) studied 616 supermarkets chosen from 28 cities. Both firm market share and a four-firm Herfindahl index were negatively but insignificantly correlated with price. Newmark (1990) also obtained a negative and insignificant coefficient on four-firm concentration in a study of the price of a market basket of goods for 27 cities. Binkley and Connor (1998) suggest one explanation for the conflicting results in terms of the product coverage in the price variable. They found a positive and significant concentration-price correlation for dry groceries, but a negative and insignificant correlation for fresh and chilled food items.

Other investigations into food retailer pricing have focused on the transmission of prices from farm to retail for commodities. This research has emphasized two primary issues: the “stickiness” of retail prices relative to farm prices, and potential asymmetries in the transmission of price from farm to retail. Of particular concern is the allegation that retail prices tend to respond more quickly and fully to farm price increases than to farm price decreases (asymmetric price transmission). To the extent that such behavior occurs, it is harmful to producer interests. If the free-on-board (f.o.b) price decreases due to a large harvest, but the decrease is not transmitted to consumers, the additional sales needed to absorb the increased production are not achieved, exacerbating the decrease in the FOB price.

The empirical evidence on asymmetry in price transmission is mixed. Kinnucan and Forker (1987, dairy products), Pick et al. (1990, citrus), and Zhang et al. (1995, peanuts) found evidence that retail prices and margins were more responsive to farm price increases than decreases. More recently, Powers and Powers (2001) found no asymmetry in the magnitude or frequency of price increases, relative to price decreases, for California-Arizona lettuce, based on a sample of 40 grocers for 317 weekly observations from 1986 to 1992.

Asymmetry of price transmission, wherein farm price increases are passed on to consumers more quickly than farm price decreases, is less readily explained. In a standard model of monopoly or oligopoly pricing, the optimal price change in response to a given increase or decrease in marginal costs may not be

symmetric, and depends upon the curvature of consumer demand (Azzam, 1999). This consideration, however, does not explain a delay in responding to a price decrease, relative to a price increase.

One of the many potential explanations for sticky or rigid prices is that of “tacit collusion.” Firms in imperfectly competitive industries (oligopolies) enforce tacitly collusive price setting arrangements through punishment strategies based on shared recognition of trigger price (Green and Porter, 1984). To sustain tacitly collusive pricing strategy, there must be some means by which rivals implicitly (not formally) cooperate with one another to fix prices.

On the other hand, sticky or fixed prices are also consistent with many models of competitive pricing behavior. The high cost of physically changing prices (Slade, 1990), the desire to prevent confusion among consumers (Bliss, 1988), the appeal of constant selling costs (Blinder et al., 1998), and the possibility that consumers become very price sensitive during recession (Rotemberg and Saloner, 1986) are some of the reasons for fixed prices in competitive markets.

The implications for competitiveness of food retailing from the research on rigidity of retail prices and asymmetry of transmission of farm-level price changes are not clear. Rotemberg and Saloner (1987) have shown that sellers with market power are more likely to maintain stable prices in response to changing costs than are competitive firms. The incentives are reversed for price changes due to demand shifts, but Rotemberg and Saloner showed that the cost effect dominates, when both cost and demand are subject to fluctuations.¹⁰ Repricing or menu costs also explain retail price rigidities. Retailers incur costs when changing prices, so a product’s price will be fixed unless its marginal cost or demand changes by a sufficient amount to justify incurring the cost of repricing.

To date, little research has been conducted on the topic of food retailers’ oligopsony power as buyers from food shippers and manufacturers. To a great extent, the issue has surfaced only recently in response to concerns over slotting and related fees charged by retailers. Oligopsony power is difficult to determine because prices paid by retailers to shippers or manufacturers

¹⁰The fundamental intuition is that as the extent of competition increases, individual sellers perceive an increasingly elastic demand. This makes price changes more beneficial because some of the benefits are derived at the expense of competitors.

are typically confidential. Retailers’ selling costs are also generally confidential and, moreover, almost impossible to apportion to individual products, given the multitude of products sold in the store.

Produce commodities provide one of the better opportunities to examine retailer buying power because farm-level prices are typically reported, as are shipping costs to major consuming centers, and sales are often direct from grower-shippers to retailers. Sexton and Zhang [1996] examined pricing for CA-AZ iceberg lettuce for January 1988-October 1992 and concluded that retailers were successful in capturing most of the market surplus (profit above harvest costs) generated for that period, essentially consigning grower-shippers’ economic profits to near zero.

Retailer Market Power: New Findings

Two new studies investigate the relative market power of shippers and retailers. Richards and Patterson (2003) examine retailer market behavior in the selling and buying of apples, oranges, grapes, and grapefruits. Sexton et al. (2003) examine the market for iceberg lettuce, packaged salads, and tomatoes.

Each study combines institutional knowledge of the industries with statistical models to test for retailer pricing behavior in regard to consumers and suppliers. The analytical approaches used in both studies illustrate the “new empirical industrial organization,” melding statistical methods with structural models of the industries they consider. The techniques in the two studies are distinct, reflecting both the range of empirical models available and some important differences in the types of commodities analyzed in each study. In particular, the products analyzed by Richards and Patterson are all storable to some extent, thereby requiring that their empirical modeling account for responsiveness of supply to current market prices, based upon incentives to move product to and from storage. In contrast, the commodities analyzed by Sexton et al. are highly perishable; supply at any point in time is essentially fixed by the available harvest and, hence, unresponsive to price.

Although the availability of microdata on retailer pricing and sales represented an important asset in conducting the two studies, neither study had direct access to data on retailers’ costs.¹¹ Although Richards and

¹¹Retailer costs include the cost of purchasing the fresh produce from shippers, storage and transportation costs, and other marketing and retailing costs. The cost of purchasing fresh produce from shippers is a large share of the retailer’s cost.

Patterson do not have direct information on retailers' costs, they know from economic theory the variables, such as wage rates, that determine the magnitude of those costs. Thus, they posit a retailer cost equation, expressed as a function of those variables and estimate the equation as part of their statistical model. Sexton et al., by contrast, use benchmarks to construct an upper and lower bound for each retailer's selling costs for each commodity. This approach leads to a commensurate upper and lower bound on the extent to which each retailer is exercising market power for the various commodities in their analysis.

The retail data set used in the empirical analyses contained weekly price and sales information on selected produce commodities.¹² Retail data were obtained from Information Resources Incorporated for 20 retail grocery chains, operating in 6 metropolitan markets (Albany, Atlanta, Chicago, Dallas, Los Angeles, and Miami) over a 2-year period (January 1998- December 1999). Within these regions, the data cover small, medium, and large supermarket retailers. Mass merchandisers, such as warehouse clubs and supercenters, are not represented.

The ERS Produce Marketing Study interviews indicated that a shipper could receive different prices from different retailers, while a retailer may pay different prices to different shippers (Calvin et al., 2001). However, such transaction data could not be obtained. As a substitute, prices paid by retailers to grower-shippers were approximated by f.o.b prices from USDA's Agricultural Marketing Service and grower organizations. F.o.b. prices represent the daily average spot price or price range received by shippers for a specific commodity and grade.

Perishable Fresh Produce

Sexton et al. (2003) examined supermarket retailers' pricing behavior for iceberg lettuce shipped from California and Arizona, mature-green tomatoes shipped from Florida and California, vine-ripe tomatoes shipped from California, and iceberg-blend fresh salads for 20 retailer supermarkets in 6 markets (table 4).

¹²In a perfect world, researchers would have access to price and marginal cost data, and assessing whether a firm was exerting market power would be straightforward – researchers would be able to calculate the price-cost markup directly. Yet cost data are proprietary information. Specifically, prices paid by a firm are normally confidential. They are not available to researchers, except in isolated cases where they were produced in the context of litigation. Thus, the vast majority of empirical industrial organization studies rely on publicly reported, market-average prices.

A typical retail supermarket carries 40,000 products, so it is not possible to evaluate the impact of retailers' behavior on consumer welfare based only upon examination of a few produce commodities. Instead, the effects of retailer pricing (to consumers) on the welfare of produce grower-shippers is examined. The tendency of some retailers to stabilize consumer prices and, in some cases, hold them constant over the 2-year period analyzed was shown to be generally detrimental to producers.

Analysis of retailer pricing behavior with regard to consumers was limited by a lack of information on retailers' costs of selling produce commodities. Reflecting this lack of information, the analysis generated a set of upper- and lower-bound estimates on the degree of retailer oligopoly power for each commodity. The results indicate that retailers are not fully exploiting consumers' unresponsiveness to price changes for produce commodities in their pricing decisions. However, the results also indicate that most retailers are setting prices for iceberg lettuce and fresh tomatoes in excess of marginal costs. Pricing above marginal costs reduces produce sales at retail relative to what would be sold under competitive pricing, and thus is detrimental to producer welfare.

Analysis of farm-retail price spreads demonstrated that the price spread widened as a function of the aggregate volume of product shipped. This finding supports the hypothesis that large volumes of these perishable commodities are used as a tool to bid down f.o.b. prices and, thus, widen the price spread. Variations in the cost of shipping the produce commodities to consuming destinations had little impact on the price spread. In general, the farm-retail price spreads are not highly correlated across retailers, indicating that retailers exhibit considerable independence in setting produce prices, even within a given city.

Statistical analysis revealed evidence that grower-shippers of iceberg lettuce received lower prices for their product than under perfect competition. Retailers were estimated to capture, on average, about 80 percent of the market surplus (retail price in excess of harvest cost) for iceberg lettuce, with retailers' share increasing as a function of the magnitude of the harvest.¹³ The farm price for iceberg lettuce was equivalent to

¹³If the market for procuring produce was perfectly competitive, the shipper would realize the entire surplus. See Sexton et al. (2003) for more detail.

Table 4—Results of retail price behavior

Product	Market competitiveness	Average retailer share of surplus (price over (harvestcost)	Price spread as a function of quantity
Perishable fresh (Sexton et al.)			
Iceberg lettuce (CA & AZ)	Perfect competition in procurement rejected Half of the supermarkets maintained constant selling price over the study period. Retail prices exceed marginal cost, suggesting retailers influence consumer prices.	80%	Increases in 11 of 12 cases
Florida mature green tomatoes	Perfect competition in procurement not rejected. Retail prices exceed marginal cost, suggesting retailers influence consumer prices.	27% ¹	No impact
CA vine-ripe tomatoes	Perfect competition in procurement not rejected Retail prices exceed marginal cost, suggesting retailers influence consumer prices.	14%	Increases in 7 of 9 cases.
CA mature green tomatoes	Perfect competition in procurement not rejected Retail prices exceed marginal cost, suggesting retailers influence consumer prices.	60% ²	Increases in all 11 cases.
Bagged lettuce	No evidence of coordination among retailers in pricing. Stable price for house brand and frequent sales for national brands.	NA	NA
Semi-perishable fresh produce (Richards and Patterson)			
Red delicious apples (WA)	Retailers influence shipper and consumer prices.	NA	Decreases in 13 of 20 cases
Florida grapefruit	Retailers influence shipper and consumer prices.	NA	Decreases in 13 of 20 cases
Fresh CA & FL oranges	Retailers exert greater influence over consumer than shipper prices.	NA	Decreases in 8 of 20 cases
Fresh CA grapes	Retailers do not influence shipper prices Retail prices exceed marginal cost, suggesting retailers influence consumer prices.	NA	Decreases in 9 of 20 cases.

NA - not available.

¹For Florida mature green tomatoes, Sexton et al. compared retail prices to the price floor (rather than harvest cost).

²This estimate of shipper/retailer share is less precise than the other estimated shares.

harvest costs for an estimated 38 of the 104 total observations.

Analysis of retailers' pricing behavior for fresh tomatoes produced mixed results. In general, tomato shippers appeared to capture a larger share of the market surplus than did iceberg lettuce shippers, and the hypothesis of perfect competition in procurement could not be rejected for mature-green tomatoes shipped from either California or Florida nor for vine-ripe tomatoes shipped from California. The price floor set for Florida mature-green tomatoes as part of a trade dispute settlement between Florida's and Mexico's shippers appeared to support the price for Florida mature greens during the 1998 and 1999 shipping seasons.¹⁴

Lack of data precluded formal analysis of pricing behavior of bagged salad retailers. Nonetheless, some useful conclusions emerge based on the available information. The 20 retailers differed markedly in the strategies they pursued for iceberg-based salads. Some chains carried only their own private label. Most carried a maximum of two brands. Great variety was also exhibited in the chains' pricing strategies. Chains that carried multiple brands usually preferred to maintain a stable and relatively low price for one brand (often their private label) and use a second brand as a premium item, but with frequent sales. The data showed no evidence of coordinated pricing for these items by chains within a city, and price correlations were low and often negative (indicating prices moving in opposite directions).

The study by Sexton et al. indicates that retailers are often able to pay prices below perfectly competitive prices to grower-shippers when procuring lettuce. Structural conditions in these markets, including low seller concentration relative to buyer concentration and sale of a perishable commodity that must move to market quickly, are consistent with such an outcome. Their results for tomatoes suggest that retailers did not pay below-competitive prices for mature-green or vine-ripe tomatoes.

Their work also indicates that supermarket retailer prices for these products were above full marginal cost, and the wide variety of pricing strategies manifested for the commodities included in the study rejects the notion of retailers acting as passive price

¹⁴Data limitations forced both the California vine-ripe and California mature-green tomato analyses to cover only the 1999 marketing year.

takers. However, there was no evidence of coordinated pricing or collusion among retailers within a city. To the extent that retailers are exercising market power, they are exploiting the unilateral market power they possess through geographic and brand differentiation.

Semi-Perishable Fresh Produce

Richards and Patterson (2003) examined Washington Red Delicious apples, California fresh grapes, California fresh oranges, and Florida fresh grapefruit (table 4). Analyses of the retail and shipping-point data revealed two main points.

- Retail prices responded more rapidly to shipping-point price increases than to declines, although this result was less significant for apples than for the other commodities.
- Retail prices are fixed relative to the variation that occurs at the shipper level. These results suggest that supermarket retailers influence prices in both the commodity and retail markets. However, retail price fixity may not be inconsistent with competitive pricing behavior.

For Washington apples, the results suggest that retailers influence both buying and selling prices in virtually all market/chain pairs. The f.o.b.-retail margin was found to be wider than it would be under competitive pricing, thereby reducing both consumer and producer welfare. Retailers' ability to influence prices decreased as the volume shipped increased.¹⁵ This decline in retail bargaining power is likely due to retailers' precommitments to higher quantities during promotional periods and to meeting retail demands created through their produce merchandising and category management programs.

For fresh grapes, individual retailers were unable to influence prices they paid to shippers. Retailers, however, consistently charged consumers prices in excess of shortrun marginal cost, although the degree of deviation from competitive pricing varied by markets. While retailers in the Albany market showed great influence on consumer prices, retailers in the Chicago

¹⁵This result differs from Sexton et al. (2003). The contrasting results follow from the perishability of their products. With storable products, shippers can withhold product from market, especially when retailer demand increases, giving the shippers increased bargaining power. For highly perishable products, retailers are able to reduce prices as shipped volume increases. Thus, the perishable nature of certain products grants retailers the upper hand in setting prices.

market did not. Except for one retailer, the Dallas market appeared to be fairly competitive in both buying and selling fresh grapes.

Retailers in fresh orange markets were found more likely to influence consumer prices than shipper prices. The presence of large independent packing houses and grower cooperatives in this market may make it difficult for retailers to influence shipper prices.

Retailers had a measurable influence over prices when buying and selling Florida grapefruit. Retailers influenced prices in buying grapefruit from shippers in 60 percent of the sample cases, and consistently set retail prices above the perfectly competitive level when selling to consumers. Retailers' ability to influence prices, with respect to shippers, decreased as the volume of

sales increased. This is likely due to retailers' need to secure sufficient supply to meet higher quantities demanded under periodic price promotions.

Richards and Patterson's study suggests that retailers set (consumer) prices in excess of the perfectly competitive level for all four commodities. Retailers' ability to hold shipper prices below the competitive level was less consistent. For two of the commodities, Washington apples and Florida grapefruits, retailers did pay shippers prices below the perfectly competitive level. Retailer ability to influence prices decreased, however, as shipments of the two commodities increased. Furthermore, shippers saw periods when prices were competitive as well as times when prices were noncompetitive.