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U.S. Fresh Produce Markets

Marketing Channels, Trade Practices, and Retail Pricing Behavior

**Carolyn Dimitri, Abebayehu Tegene
and Phil R. Kaufman**

Abstract

Retail consolidation, technological change in production and marketing, and growing consumer demand for produce have altered the traditional market relationships between producers, wholesalers, and retailers. Increasingly, produce suppliers are asked to provide additional marketing services and incentives in exchange for volume purchases and other commitments by buyers. This report synthesizes the results from a multiphase project that examined the dynamics of produce marketing, the produce shipper-retailer relationship, and how changes in the produce market affect the relative market influence of producers, retailers, and consumers.

Keywords: Fresh fruits and vegetables, fresh produce, fresh produce marketing channels, supermarket, market power, competition, trading practices.

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Summary

By all accounts, marketing fresh fruits and vegetables has been transformed. First, consumer demand has increased for greater variety and quality in fresh produce. Second, supermarkets have merged, acquired new stores, and grown larger. Third, anecdotal evidence suggests that the role of merchant wholesalers in produce has become less important while that of the foodservice sector has increased. And fourth, nonprice provisions such as marketing fees have grown increasingly common in transactions between retailers and grower-shippers.

ERS's study of the produce industry aimed to answer several questions. What is the current state of the produce industry? How do produce shippers and retailers conduct business? And is the increased use of different types of marketing fees the result of growing retailer influence or business efficiencies?

The scarcity of public data led ERS to use a three-pronged approach.

- ERS collaborated with Cornell University, and exhausted the public domain for data describing the fresh produce industry; these results are published in the ERS report, *Understanding the Dynamics of Produce Markets: Consumption and Consolidation Grow*, August 2000.
- Because data on transactions between shippers and retailers are scarce, ERS—in collaboration with the University of California, Davis; University of Arizona, and University of Florida—conducted interviews of shippers, retailers, and wholesalers for information on marketing of grapes, oranges, grapefruit, tomatoes, lettuce, and bagged salad. While the small number of interviews warrant caution in interpreting the findings, the research enhances understanding of recent changes in produce marketing. Results from this portion of the project are published in *U.S. Fresh Fruit and Vegetable Marketing: Emerging Trade Practices, Trends, and Issues*, January 2001.
- ERS contracted studies with university researchers to assess the pricing by retailers for some fresh produce commodities in selected markets. Timothy Richards and Paul Patterson (Arizona State University) investigated supermarket retailer behavior in the selling and buying of Washington apples, California oranges, California grapes, and Florida

grapefruits in *Competition in Fresh Produce Markets: An Empirical Analysis of Channel Performance*, published by ERS in September 2003. Richard Sexton, Mingxia Zhang, and James Chalfant (University of California, Davis) examined the market for California and Arizona iceberg lettuce, packaged salads, and Florida and California tomatoes in *Grocery Retailer Behavior in the Procurement and Sale of Perishable Fresh Produce Commodities*, published by ERS in September 2003.

U.S. produce markets have evolved considerably since the 1980s. Per capita consumption of fresh fruits and vegetables increased 6 percent between 1987 and 1995, and 8 percent between 1995 and 2000. New products were introduced to meet burgeoning consumer demand, and as a result, the average produce department is larger. The marketing channels have changed also. The share of produce volume sold directly by grower-shippers to retail supermarkets has increased, as have sales to the foodservice sector.

Mass merchandisers, emphasizing everyday-low-price strategies, have provided new competition for supermarkets. In response, large supermarket retailers have emphasized customer service while pursuing efficiency gains and lower capital investment costs. Many of them have merged or acquired other chains, citing the potential for lower costs through streamlined operations, volume discounts in buying, and exclusive partner relationships. Consolidation through mergers and acquisitions by grocery retailers has produced a significant increase in the share of total U.S. grocery store sales by the largest firms.

Coincident with these changes were new provisions in retailer-shipper transactions. Most controversial is the “slotting fee,” where suppliers pay a lump sum to retailers for introducing their new products to the supermarket shelves. The use of fees and services is controversial. Some argue that they are a manifestation of retailers' market power over shippers, while others suggest the various fee and service requests have efficiency-based motives. Because both points of view are valid, empirical evidence is needed to provide greater insight into the factors underlying fees and retail consolidation. To date, no comprehensive empirical studies have examined these issues, largely because transaction data are proprietary. Thus, the issue remains unresolved.

To assess emerging practices in the produce sector, such as retailers' requests that shippers pay slotting fees or provide services like customized containers, it helps to understand the importance of retailer market power. If they possess little or no market power, then fee and service requests must be driven by efficiency concerns, in which case policy response is inappropriate. If market power exists, fees and services may be a symptom of that market power, but the appropriate policy remedies may not focus on disallowing use of such fees and services so much as the exertion of market power itself. If retailers hold market power over grower-shippers or consumers, banning the use of particular fees and/or services may simply cause that power to be manifested elsewhere, such as in lower acquisition prices, and perhaps at the cost of reduced efficiency.

Econometric analysis indicated that retailers do influence prices paid to fresh produce shippers and by con-

sumers for some commodities. Retailer ability to hold shipper prices below competitive prices was evident for grapefruit, apples, and lettuce, but not for tomatoes, grapes, and oranges. Consumer prices in excess of purely competitive prices were evident for apples, oranges, grapefruit, fresh grapes, tomatoes, and lettuce.

ERS' multiphase project has provided a deeper understanding of the relationship between retailers and shippers, ranging from the form of the transaction to the degree of retailers' influence over prices paid to shippers for some products. Despite these advances, several important questions remain. Specifically, does the presence of market power engender new trends in marketing, such as direct buying from grower-shippers, supply chain management, and fees and services? Or are they the outcome of efforts to gain distribution efficiencies? Making that determination requires additional research.

Introduction

The fresh produce market has changed markedly over the last 15 years. Shifts in consumer demand, technological change in production and marketing, and retail consolidation have altered the traditional market relationships between producers, wholesalers, and retailers. Consumers are eating more fresh produce, purchasing a wider variety year-round, and demanding more convenience, like bagged salads. Information technology has introduced efficiencies throughout the supply chain, reducing production and marketing costs. Retail consolidation has occurred rapidly as large supermarket firms have merged or been acquired. Mass merchandisers and warehouse club retailers are selling an increasing volume of food products with low-price strategies. Fresh fruits and vegetables sold to restaurants, fast-food outlets, and other foodservice operators have grown to account for more than half of all retail produce sales.

Against this backdrop of changing supply and demand relations, fresh produce suppliers for supermarkets and mass merchandisers are being asked to provide additional marketing services and incentives in exchange for volume purchases and other commitments by buyers. The demand for such fees and services coincides with new modes of supermarket retailer operation.

To assess emerging practices in the produce sector, such as retailers' requests that shippers pay slotting fees or provide various services, it helps to understand the importance of retailer market power. If they possess little or no market power, then fee and service requests must be driven by efficiency concerns, in which case policy response is inappropriate. If market power exists, fees and services may be a symptom of that market power, but the appropriate policy remedies may not focus on disallowing use of such fees and services. Rather, the focus of policy should be on the exertion of market power itself. If retailers hold market power over grower-shippers or consumers, banning the use of particular fees and/or services may simply cause that power to be manifested elsewhere, such as in lower acquisition prices, and perhaps at the cost of reduced efficiency.

To put the changing relationship between produce suppliers and supermarket retailers in perspective, ERS, at the request of the Secretary of Agriculture, conducted a multiphase project, the results of which are summarized in this report. The overall project had three major objectives:

- Develop a comprehensive overview of the produce industry from grower-shipper to retailer, including consumption and retail sales trends, markets and marketing channels, and the changing structure of produce buyers.
- Identify and characterize the types of trade practices used in the produce industry, including fees and services provided by shippers, contracts, and other marketing strategies.
- Analyze shipper-to-retailer and retailer-to-consumer pricing behavior to assess the relative influence of retailers, grower-shippers, and consumers in the market for fresh produce.

The project focused on several homogeneous fresh produce items: California grapes, California oranges, California vine-ripe tomatoes, Florida and California mature-green tomatoes, Florida grapefruit, California and Arizona lettuce, bagged salads, and Washington apples.¹ These products were selected for their importance as a share of total production volume or share of retail sales. In terms of farm value, leading fruit products are grapes, oranges, and apples. (In terms of volume, apples, oranges, grapefruit, and grapes are the top fruit products.) The fruits with the highest value at the retail level in 1997 were apples, oranges, and strawberries. In terms of farm value, leading vegetable products were potatoes, tomatoes, and lettuce. At the retail level, the top three vegetables in 1997 were lettuce, tomatoes, and potatoes.

All of the issues summarized here are examined in detail in several companion publications (see box).

¹Apples are included in the examination of retail pricing behavior only, while both trade practices and retail pricing behavior are explored for oranges, grapefruit, grapes, tomatoes, and lettuce.

The Project's Publications

ERS collaborated with Geoffrey M. Green, Edward W. McLaughlin, and Kristen Park, from Cornell University, to develop a comprehensive overview of the produce industry, including changes in consumption, retail sales, and marketing channels. The research relied on public data to document changes in produce markets from 1987 to 1997 in the United States, and identified consumer, retailer, wholesaler, and supplier forces acting on market channels. The results of this research were published in the ERS report, *Understanding the Dynamics of Produce Markets: Consumption and Consolidation Grow*, published by ERS in August 2000.

ERS collaborated with researchers from the University of California (Roberta Cook-Canela), University of Arizona (Gary Thompson), and University of Florida (Suzanne Thornsby). The results of this effort were published as *U.S. Fresh Fruit and Vegetable Marketing: Emerging Trade Practices, Trends, and Issues*, published by ERS in January 2001. In this report, ERS relied on in-person discussions with shippers, wholesalers, and retailers to provide a rich description of current marketing practices, covering sales channels, types of sales, and fees (including the widely discussed slotting fee) and services that are frequently part of transactions.

Timothy Richards and Paul Patterson (Arizona State University) investigated supermarket retailer behavior in the selling and buying of Washington apples, California oranges, California grapes, and Florida grapefruits in *Competition in Fresh Produce Markets: An Empirical Analysis of Channel Performance*, published by ERS in August 2003. Richard Sexton, Mingxia Zhang, and James Chalfant (University of California, Davis) examined the market for California and Arizona iceberg lettuce, packaged salads, and Florida and California tomatoes in *Grocery Retailer Behavior in the Procurement and Sale of Perishable Fresh Produce Commodities*, published by ERS in August 2003.

Today's Produce Industry²

Fresh fruit and vegetable products move quickly through the marketing system to combat spoilage. After harvest, fresh produce is handled and packed either by a shipper or grower-shipper. Produce grown in the United States may be exported, or sold direct to consumers, retail stores, or foodservice establishments. Sales from grower-shippers to retailers and foodservice establishments might be mediated by wholesalers or brokers, or might occur directly.

These marketing channels have undergone considerable change since the late 1980s. Prior to 1987, fresh fruit and vegetable markets were more fragmented; most transactions took place between produce grower-shippers and wholesalers on a day-to-day basis, based on fluctuating market prices and quality levels. Today, a typical produce sale may take place between a multi-product grower-shipper and a large supermarket retailer under a standing agreement or contract specifying various conditions and terms, including marketing services provided by the grower-shipper, volume discounts, and other price adjustments and quality speci-

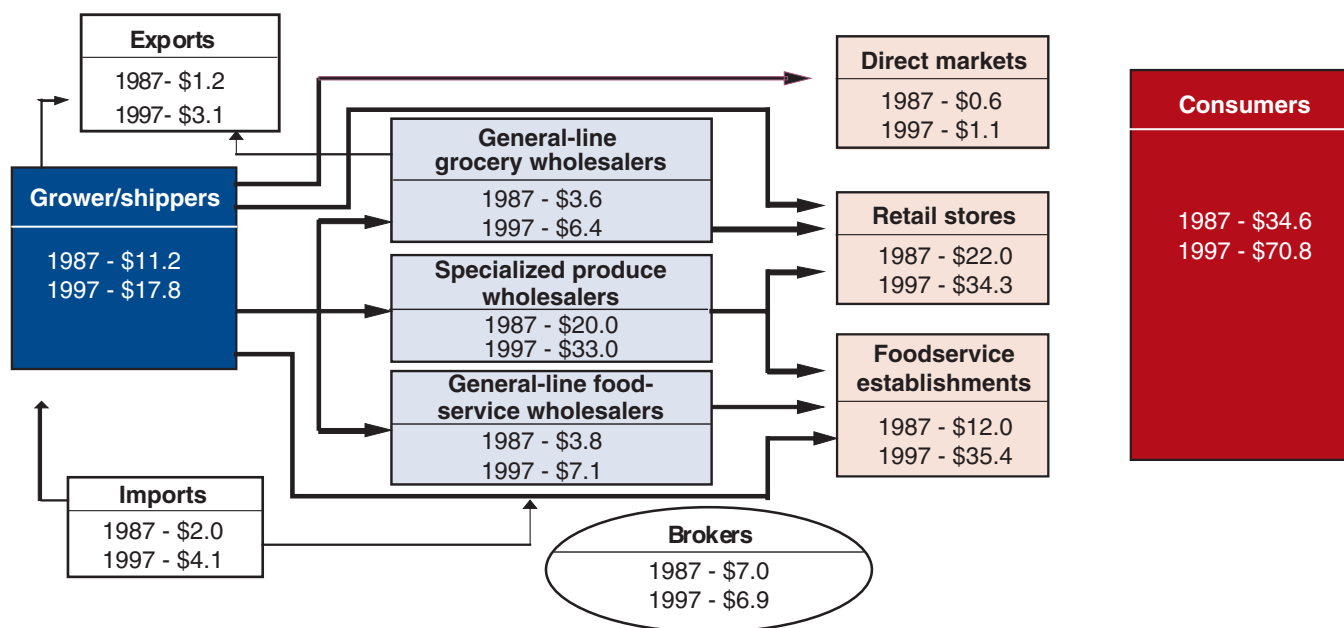
cations. Changes in these marketing services coincided with the growth of value-added and consumer-branded products, increasing variety, consolidation of food wholesalers and retailers, the expansion of the foodservice sector, and the greater role of produce imports and year-round supply.

In 1997, \$1.1 billion worth of produce was sold directly to the consumer, \$34.3 billion in retail stores, and \$35.4 billion through foodservice establishments (fig. 1). While the dollar amount of produce moving through specialized produce wholesalers increased from \$20 billion in 1987 to \$33 billion in 1997, the share of produce wholesaler sales to retailers declined—from 38.1 percent to 34.6 percent (fig. 2). Large retail stores have increased the volume of direct purchases, bypassing produce wholesalers. At the same time, wholesalers dramatically increased their share of produce sales to the foodservice channel—from 8.4 percent of sales in 1987 to 21.2 percent of sales in 1997. This threefold increase occurred as consumers devoted more of their food dollar to restaurants, fast-food outlets, schools, and other foodservice outlets.

Americans are spending more on fresh produce, and in addition to buying a greater quantity of produce, they are buying new value-added products. Per capita consumption of fresh fruits and vegetables increased 6 per-

²For additional information on the material in this section, see Kaufman et al., 2000.

Figure 1
Fresh fruit and vegetable marketing channels 1987 and 1997



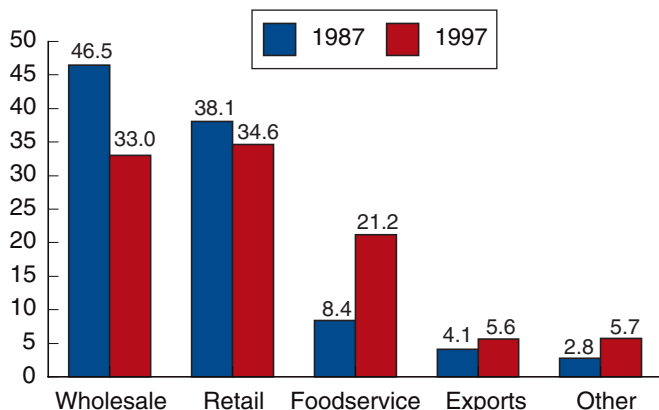
Note: All values are in \$ billion.

Sources: Census of Wholesale Trade Census of Retail Trade; Blue Book, 1997; McLaughlin et al., 1998.

Figure 2

Produce wholesalers sales

Produce wholesaler sales to retailers declined while sales to food service increased



Source: Census of Wholesale Trade, 1987 and 1997.

cent between 1987 and 1995, and 8 percent between 1995 and 2000 (table 1). As consumption has increased, so has the demand for variety, convenience, and quality, as evidenced by the explosion in produce department offerings (fig. 3). Many products (for example, lettuce and tomatoes) are available year-round, produce is pre-cut, and more packaged and branded products are available. The share of branded produce increased from 7 percent in 1987 to 19 percent in 1997, while fresh-cut produce and packaged salads rose from 1 percent to 15 percent of total sales (fig. 4).

Supermarkets, including supercenters,³ accounted for the largest share (91.5 percent) of produce sales in foodstores in 1997, amounting to \$30.2 billion. Produce sales by supermarkets and supercenters totaled almost 43 percent of total retail produce sales by foodstores and foodservice establishments (Kaufman et al., 2000). For this reason, supermarket developments have considerable impact on wholesalers, grower-shippers, and other intermediaries.

Economic forces—from both consumers and competitors—have been changing the environment in which supermarkets compete. The share of income spent for food-at-home purchases continues to fall. Consumers spent almost 47 percent of their food dollars in the foodservice/restaurant sector in 2000, compared with 44.7 percent in 1987 and 46.6 percent in 1997 (ERS, 2003).

³A supercenter is a large combination supermarket and discount general merchandise store, with grocery products accounting for up to 40 percent of selling area.

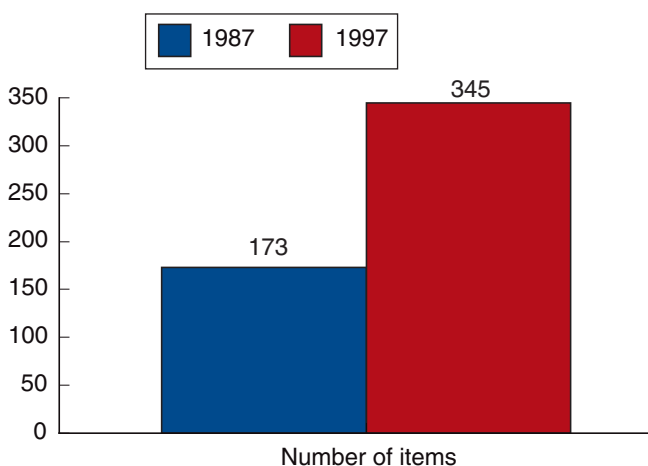
Table 1—U.S. consumption of fresh fruits and vegetables

	Pounds of Consumption Per Capita		
	1987	1995	2000
Fresh fruits	121	125	130
Fresh vegetables	162	177	196
Total	283	301	326

Source: USDA, *Fruit and Tree Nuts Situation and Outlook Yearbook, 2000*, and *Vegetables and Specialties Situation and Outlook Yearbook, 2000*.

Figure 3

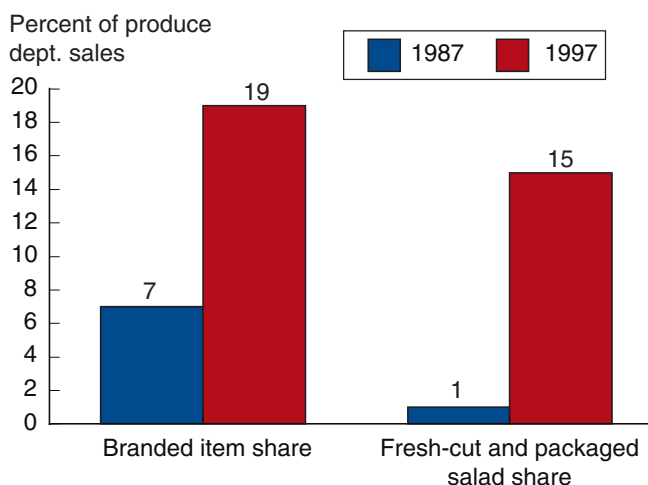
The variety of fresh produce items carried by retailers has increased



Source: Supermarket Business, October 1999.

Figure 4

Branded and packaged items account for a growing share of produce sales



Source: P. Kaufman, et. al. "Understanding the Dynamics of Produce Markets," USDA-ERS (AIB-758).

In addition, rapid expansion of retail food sales by mass merchandise and warehouse club stores has provided additional competition; they captured 8.5 percent of total retail food sales in 2000, up from 2.4 percent in 1987 and 6.8 percent in 1997. Meanwhile, the share of food sales by supermarkets fell from 63.7 percent to 57.8 percent over 1987-2000.

Mass merchandisers such as Wal-Mart, Kmart, and Target have emphasized everyday-low-price strategies to achieve rapid growth in food sales. They have also introduced innovations in the procurement and distribution of the products they sell to gain efficiencies and lower costs (Kinsey 2000; *Supermarket News*, 2002a, 2002b). They customarily purchase large volumes of produce to obtain the lowest prices from suppliers.

Some mass merchandisers, such as Wal-Mart, do not accept fees as part of their transactions. Instead, Wal-Mart provides suppliers with real-time store sales data to support distribution, inventory management, and in-store promotion activities (Kinsey, 2000). Wal-Mart also introduced a standardized returnable (to the supplier) plastic container that is used both for distributing fresh fruit and vegetable products to their stores and for in-store product display. The Wal-Mart model emphasizes cooperation and coordination of activities in the supply chain between suppliers and buyers, with the goal of reducing systemwide costs. Many features of the so-called “Wal-Mart model” were incorporated in the supermarket industry initiative known as Efficient Consumer Response (ECR), introduced in 1992.

Large supermarket retailers have sought efficiency gains, in the form of lower labor and capital costs, product differentiation, and improved consumer services (*Wall Street Journal*, 1998).

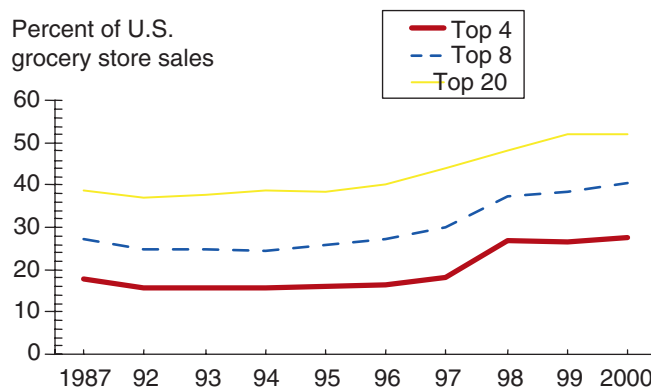
Many supermarket retailers have merged or expanded through acquisitions, citing the potential for lower costs as an incentive for becoming larger (Kroger Co., 2000; Safeway, 2001; *Food Institute Digest*, 2000). Consolidating retailers have cited potential cost savings through streamlining of product distribution functions (*Wall Street Journal*, *The Packer*, company press

releases). Large retailers typically perform wholesaling activities such as purchasing goods from suppliers, arranging for shipment to distribution warehouses, and replenishing store-level inventory.

Supply-chain management practices such as continuous inventory replenishment, the use of cross-docking facilities, direct store delivery by suppliers, and selective use of specialty wholesalers can reduce the need for large distribution centers and their associated costs. The number of distribution centers can be reduced, while remaining warehouses can be used more efficiently. Supply chain initiatives have also spurred the greater use of forward contracting arrangements that set fixed prices for suppliers.

To achieve these efficiencies, retailers are consolidating, as evidenced by a significant increase in the share of total U.S. grocery store sales by the largest firms (fig. 5). By 2000, the share of the 20 largest retailers had reached 52.0 percent of total grocery sales, up from 36.5 percent in 1987. While retail concentration at the national level has increased, concentration at the local level has not changed significantly. This is important because local concentration may influence the degree of retailer control over consumer prices.

Figure 5
U.S. grocery store concentration, 1987-2000¹



¹Includes grocery sales of Wal-Mart supercenters but no other mass merchandisers.

Sources: Monthly Retail Trade Survey, Census Bureau; Company annual reports.

New Relationships Between Retailers and Shippers: Trade Practices

Retailer-shipper agreements center on quantity and price considerations. Increasingly, however, retailer-shipper transactions include off-invoice marketing and trade practices. “Trade practices” cover both fees (such as volume discounts and slotting fees) and services (like automatic inventory replenishment, special packaging, and requirements for third-party food safety certification.) The term also refers to the overall structure of a transaction—for example, long-term relationships or contracts versus daily sales with no continuing commitment. The specific provisions of transactions between buyers and sellers are, by their nature, proprietary. Little public information is available, except for anecdotal information reported in trade publications.

There are differences in opinion about the growing use of fees and services in marketing produce. Shippers argue that mergers have given retailers market power over them, citing fees and services as evidence. These fees, they argue, undercut competition and reduce consumer welfare by reducing output, increasing prices, or slowing product innovation. Retailers counter that the explosion in new products exerts enormous pressure on a limited amount of shelf space, and fees serve to efficiently allocate that space. Thus, increases in fees reflect the increasing cost of retailing (Bloom et al., 2000).

To better understand trade practices, ERS and its cooperators conducted personal interviews with shippers, supermarket retailers, and wholesalers.⁴ The interviews focused on the following products: California grapes, California oranges, Florida and California mature-green tomatoes, California vine-ripe tomatoes, Florida grapefruit, and California/Arizona lettuce (head, leaf, and romaine) and bagged salads. Shippers, retailers, and wholesalers answered questions about contracts, fees, marketing services, pricing, number of accounts, and length of accounts for the years 1994 and 1999.

Seventy-four personal interviews were conducted: 57 with shippers and 17 with retailers and wholesalers (table 2). Proportional random sampling was used to select the shippers interviewed, with medium and large firms given more weight in the sample selection process than small. (Small shippers sell very little to

⁴Results from these interviews are reported in greater depth in Calvin et al.

retailers, the focus of the study.) Retailers (supermarkets) and wholesalers were both large and midsized, and covered different regions.

Interview results suggest that the structure of the shipping industry varies greatly according to product. For example, in 1999 there were 149 California grape shippers, with none accounting for over 6 percent of total industry sales. At the other extreme, there were only 25 California tomato shippers, down from 31 in 1996. While there were 54 bagged salad firms selling to retailers (down from 63 in 1994), the top two firms accounted for 76 percent of total fresh-cut salad sales in supermarkets. Hence, for a few fresh produce items, concentration of sales at the shipper level has surpassed that of retailers, even though the sales of these firms may still be small relative to those of the large retail chains.

The wave of retail consolidation in the late 1990s raised the question of whether newly formed companies were merging their buying operations. If they were, shippers might have fewer supermarket customers since each buyer would be purchasing for a larger number of stores, which might increase the negotiating power of buyers relative to shippers.

When asked about the number of customers (supermarket, foodservice, and mass merchandisers), shippers reported small changes in the number of regular customers. Although some shippers reported a decrease in the total number of customers, roughly as many reported an increase. Some shippers were selling to fewer but larger retail accounts, and others were replacing retail accounts with other types, such as foodservice buyers.

Supermarket retailers report similar findings: between 1994 and 1999, retailers reported that the number of their produce buyers remained fairly constant at the corporate and division levels, although 18 percent reported a decline in field buyers. The ultimate impact on shippers of fewer supermarket field buyers is likely offset by the increase in purchases by foodservice buyers and mass merchandisers.

Although the total number of produce buyers of all types may not have changed much for most shippers between 1994 and 1999, the importance of the largest buyers has increased (table 3). The top four buyers accounted for 22 to 45 percent of sales in 1999, depending on the product. The largest increase (11

Table 2—Number of firms interviewed, total number of shippers, and share of State production

Type of firm	Firms interviewed	Shippers in State	Share of 1999 State production ¹
		Number	Percent
Shippers			
California fresh grape	9	149	19
California orange	9	39	38
Florida grapefruit	8	110	54
California tomato	8	25	56
California tomato (repackers)	2	n.a.	n.a.
Florida tomato	6	65	32
California/Arizona lettuce ²	8	n.a.	n.a.
California/Arizona bagged salad ³	7	54	n.a.
Retailers and wholesalers			
National retailers	8	n.a.	n.a.
Regional retailers	6	n.a.	n.a.
Wholesalers	3	n.a.	n.a.

Notes: n.a.= Not available or not applicable.

¹Imports and production from other States handled by these shippers were excluded in determining the sample share of State production.

²Lettuce includes head, leaf, and romaine.

³Number of firms selling bagged salads nationally to mainstream supermarkets is used as a proxy for the number of California/Arizona shippers.

Sources: Calvin et al., 2001.

Table 3—Share of total shipper sales going to top 4 and top 10 buyers, 1994 and 1999¹

	California grapes	California oranges	Florida grapefruit	California tomatoes	Florida tomatoes	CA&AZ lettuce
Top 4 buyers:						
	<i>Percent of sales</i>					
1994	29	28	26	26	34	21
1999	31	34	29	28	45	22
Top 10 buyers:						
1994	47	46	54	45	48	37
1999	49	52	51	48	59	39

¹Results are based on a limited number of observations and must be interpreted with caution.

Source: Economic Research Service, Produce Marketing Study interviews, 1999-2000.

percent) in this share was for Florida tomato shippers. Retail buyers, on the other hand, reported their top four suppliers provided from 85 to 97 percent of total purchases, depending on the product, in 1999 (fig. 6).

Nonprice Provisions

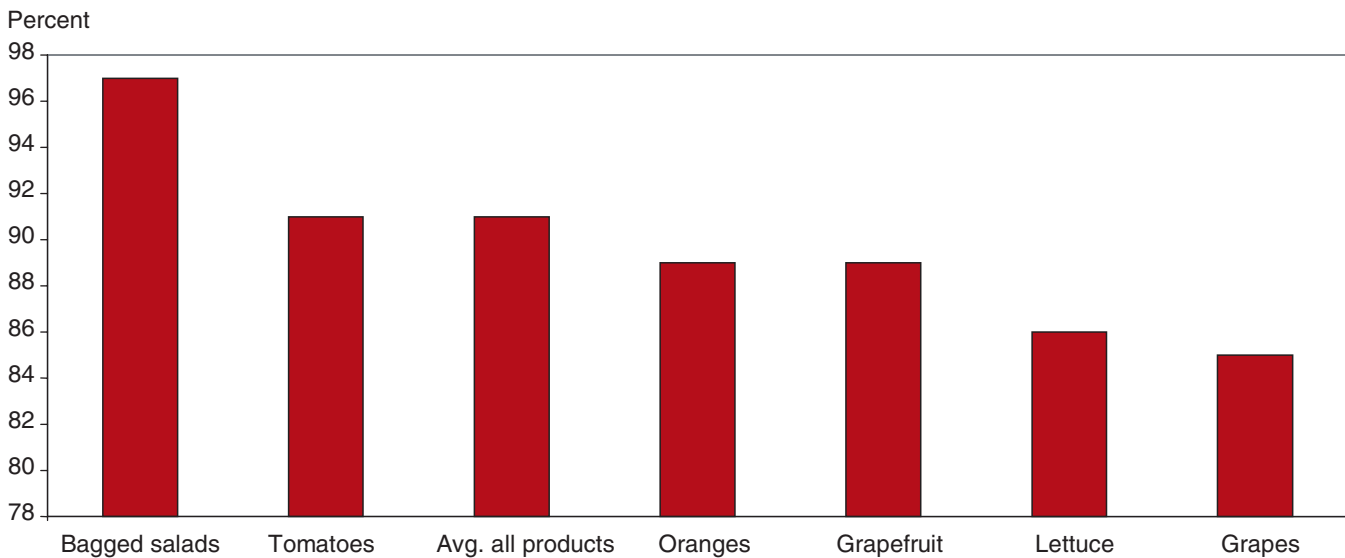
Traditionally, the fresh produce industry has been characterized by daily sales transactions. For grapes, oranges, grapefruit, and tomatoes, daily sales remain the most important sales mechanism across all types of buyers. However, the share of daily transactions to total transactions declined from 72 percent in 1994 to 58 percent in 1999. The use of advance pricing arrangements for promotions increased from 19 to 24 percent over the same time period, and the number of

weeks in advance for which prices are fixed appears to have grown as well.

The use of contracts has also become more common. In 1999, short-term contracts accounted for 11 percent of total commodity sales (grapes, oranges, grapefruit, and tomatoes), and long-term (annual or multiyear) contracts 7 percent. Lettuce sales mechanisms in 1999 were similar to those of other commodities, except that all contracts were long term. Bagged salad shippers indicated that annual or multiyear contracts are the standard for retail sales.

Since the inception of supermarkets when retailers requested free samples of products, nonprice provisions have been part of the retailer-shipper transaction. Since then, new kinds of provisions have been intro-

Figure 6

Share of produce purchased by retailers from their top four suppliers in 1999

Source: Economic Research Service, Produce Marketing Study interviews, 1999-2000.

duced. Shipper and retailer interviews provided insight into the frequency and magnitudes of the provisions. Most shippers and retailers reported that the incidence and magnitude of fees and services associated with transactions had increased between 1994 and 1999. Fees paid to retailers are usually around 1 percent of sales for grapes, oranges, grapefruit, and tomatoes, and range from 1 to 8 percent for bagged salads. Overall, 48 percent of the types of fees requested were new in the last 5 years (1994-99).

Forty-one percent of firms reported they had lost accounts when they did not comply with a fee request from retail or mass-merchandise buyers. The most frequently paid type of fee is the volume discount, a trade practice that has been used for years, although shippers agree that the incidence and magnitude of this fee has increased. Volume incentives can promote a more stable relationship between suppliers and retailers; as the retailer buys more units from the supplier, costs per unit decline, providing an incentive for the retailer to buy larger quantities (over the season) from a particular supplier. Shippers and retailers may both gain efficiencies in marketing by increasing the size of accounts.

Slotting fees have long been used in the supermarket for dry grocery items, and recently entered the fresh produce department. Slotting fees are common for fresh-cut produce and may be either requested by

retailers or offered by shippers. Bagged-salad shippers reported that shippers, not retailers, first introduced slotting fees to this industry in an attempt to buy market share from their competition; they also reported that the fees began before the last wave of retail consolidation. Slotting fees were reported to range from \$10,000 to \$20,000 for small retail accounts to \$500,000 for a division of a multiregional chain, and up to \$2 million to acquire the entire business of a large multiregional chain. None of the grape, orange, grapefruit, and tomato shippers reported paying slotting fees as defined in our study.

Requests for marketing services from produce shippers have increased, with 77 percent of requests reported as new between 1994 and 1999 (see box "Select Services Requested"). Overall, shippers reported having lost 21 percent of accounts for noncompliance with a service request. Shippers believe they receive more benefits from providing services than from paying fees, as they may obtain advantages relative to competitors. This likely explains their higher compliance with services than fees. According to shippers, the most common service requested is third-party food safety certification, followed by returnable plastic containers.

Retailer interviews indicate that 9 out of 10 retailers requested more services from their suppliers in 1999 than in 1994. On average, retailers report requesting 5.5 different services from suppliers. The top three ser-

Select Services Requested

Third-party food certification. Third-party food certifiers examine suppliers for compliance with microbial quality control processes, pesticide application, and pesticide residue regulations.

Returnable containers/pallets. Recyclable plastic cartons and standardized pallets may help to streamline handling at the distribution and retail levels.

Electronic data interchange. Electronic interchanges between specific retailers and their preferred suppliers are used for invoicing, electronic ordering, and other procurement activities.

Provision of private labels. Private-label products (also known as “house brands”) bear the name of the retail outlet where they are sold (such as Safeway or Stop & Shop). Suppliers and retailers can lower costs and increase gross margins by selling private-label products.

Automatic inventory replenishment. The supplier is electronically integrated into the buyer’s inventory management system. The preferred supplier has responsibility for and access to the data necessary to co-manage the inventory with the retailer.

Category management. Retailers who use category management (merchandising of product groupings based on actual consumer purchasing patterns) analyze detailed sales data to create an optimal product mix, usually with the help of a manufacturer from within that category.

vices requested (as reported by retailers) are private-label produce items, category management, and electronic data interchange. More than half of retailers asked for special transportation arrangements (such as discounts on transportation for large volume sales), new types of packaging, and third-party food safety certification.

Interviews with shippers and retailers indicate that their relationship is changing. But are increased fees and services the result of retailer market power over shippers? Or has the trading relationship changed because of increased consumer demand, technological innovations in marketing/retailing fresh produce, and growth in foodservice firms and mass merchandisers? An important first step in addressing these questions is to examine retailer pricing behavior.

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.

Conclusion

Four key developments prompted this study. First, consumer demand for greater variety and quality in fresh produce has risen. Second, supermarkets have merged, acquired new stores, and grown larger. Third, anecdotal evidence suggests that the role of merchant wholesalers in produce has faded while that of the foodservice sector has grown. And fourth, nonprice provisions such as marketing fees have grown increasingly common in transactions between retailers and grower-shippers.

ERS's study of the produce industry aimed to answer several questions. What is the current state of the produce industry? How do produce shippers and retailers conduct business? And is the increased use of different types of marketing fees the result of growing retailer influence or business efficiencies?

As the average consumer now enjoys year-round availability of many fresh fruits and vegetables, pre-cut produce, and more packaged/branded products, the underlying marketing system has changed too. Large self-distributing supermarkets are buying a larger share of fresh produce directly from shippers. By 2000, retail concentration had increased at the national level but not at the local level. Many shippers reported little change in the number of total customers, although most saw fewer retail buyers and more foodservice accounts. We found that shippers too are consolidating, with tomato and bagged lettuce shippers among the most concentrated.

Advance pricing arrangements and contracts are becoming more common. Fees and services are being used more frequently. Volume discounts are the most commonly imposed fee, while returnable plastic containers are the service most often requested. Slotting fees are not used for bulk items, such as tomatoes, lettuce, grapes, grapefruit, and oranges, but are used in the bagged salad industry. Interviewed shippers were

concerned about fees and services, fearing that they would lose accounts if they did not comply with buyer requests.

Two empirical studies conducted in this project suggest retailers are able to influence prices paid to fresh produce shippers and by consumers for some of the commodities. Consumer prices in excess of competitive prices were evident for Washington State apples, California oranges, Florida grapefruit, California fresh grapes, California and Florida tomatoes, and California and Arizona iceberg lettuce. Retailers' ability to hold shipper prices below competitive prices was evident for Florida grapefruit, Washington State apples, and iceberg lettuce, but not for California and Florida tomatoes, California grapes, and California oranges.

These results indicate the need for future research with regard to empirical robustness. To what extent are these findings (of retailer market power) applicable to produce categories not included in the study? How would the econometric results change if we had access to individual retailer procurement and operating cost data? How would these results differ had the retailer market power analyses included supercenters and mass merchandise retailers?

From a policy perspective, it is vital to determine whether fees, services, and other trends like supply chain management are the result of retailer market power or the desire to gain distribution efficiencies. What are the different retailer-shipper models for procuring, marketing, and retailing produce, and what are their implications for competition in produce markets? Which factors drive retailer pricing behavior? How do the incidence of fees and services and the type of fees and services vary across shippers and retailers? Are specific fees and services used to accentuate a particular shipper or retailer's business strength? As researchers address these complex questions, we will better understand competition in produce markets.

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