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Effect of a New Wal-Mart Supercenter on Local Retail Food Prices

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Introduction

The number of non-traditional retail outlets, such as warehouse clubs and discount mass merchandisers, has increased substantially in the past decade. Traditional supermarkets are facing serious competition from these retail outlets because non-traditional retailers with low-operating margins are able to provide low-price appeal to consumers (Capps and Griffin, 1998). Warehouse clubs and supercenters typically consist of a complete discount, general merchandise outlet and a large-scale supermarket together under one roof. Kaufman (1996) estimated that the combined grocery products sale of non-traditional retail outlets, club stores, and supercenters would reach about \$70 billion, or about 14 percent, of all grocery-related sales in 2000. According to Capps and Griffin (1998), supercenters, ranging in size from 100,000–200,000 square feet, are the prime retail growth vehicle of the future. Their study showed that the impact of a Wal-Mart store could mean as much as a 21 percent reduction in the sales of traditional supermarkets.

In this study, we monitored food price changes in Athens-Clarke County, Georgia. Georgia has 42 metropolitan counties and 117 non-metropolitan counties (Selig Center for Economic Growth, 1998). As a small metropolitan area, Athens has several traditional supermarkets. The Wal-Mart supercenter in Athens opened on January 25, 2000. The addition of the Wal-Mart supercenter was expected to increase price competition among existing supermarkets and food retailers in Athens. The effect of increasing competition from the Wal-Mart supercenter could force traditional supermarkets to change and adopt new food-pricing strategies. The objective of this study is to determine the impact of the opening of a new Wal-Mart supercenter on retail food prices among selected supermarkets in Athens, Georgia.

Data

To monitor the competitiveness of food pricing among the supermarkets, a survey of retail food prices was conducted among six major traditional supermarkets (Bi-Lo, Food Lion, Harris-Teeter, Ingles, Kroger, and Publix) in Athens before and after the opening of the Wal-Mart supercenter. These supermarkets are geographically located on the east and west sides of Athens. Food Lion and the Wal-Mart supercenter are located on the east side, and Harris-Teeter, Ingles, and Publix are located on the west side. Bi-Lo and Kroger have stores located on both sides of the city.

Food retail price data from each grocery store were gathered from November 1999 through April 2000 on a weekly basis for 11 weeks before and 11 weeks after the opening of the Wal-Mart supercenter. Supermarket prices were collected for a total of 95 food items grouped into 12 categories. These categories include cereals and bakery products, dairy products, red meats, poultry, fish, other meats, eggs, fresh vegetables, fresh fruits, processed fruits and vegetables, sugar, and miscellaneous food items. The food items were selected on the basis of the Consumer Expenditure Survey (BLS, 2000) and average household food consumption data (USDA, 1997).

Food Price Indexes

Usually, the Consumer Price Index (CPI) is used to measure changes in the price of goods and services that a specified population pays for consumption over time (Turvey, 1989). However, price changes with respect to "food at home" are considered in this study for only selected local retail food stores during a 22-week period. To this end, three price indexes were constructed from the survey data to test a primary hypothesis that the opening of a Wal-Mart supercenter would induce a significant change in the food-pricing pattern among the neighboring traditional supermarkets. In addition, it is hypothesized that the effects of price changes will dissipate over distance and time.

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In order to test these hypotheses, a common measurement—such as a market basket or food price indexes—is needed (Vogt and Barta, 1997). Consumer price indexes are usually estimated for the period in which expenditures are measured to obtain weights preceding the price reference period. The weights may be calculated using a revaluation of these expenditures during the study period. To construct a consumer price index, it is desirable to have household expenditure data cover the entire year and information on regional expenditures by household characteristics (Turvey, 1989).

For this study, only primary data for selected retail food prices were collected. Given this, per capita food consumption data (USDA, 1997) were used to represent a consumption basket, and average annual food expenditures of households in the southern region of the United States (BLS, 2000) were used to approximate consumers' food cost. These data were used as appropriate weights for the construction of price indexes representative of selected food items among the selected supermarkets. Although 95 items were monitored at each traditional supermarket before and after the opening of the Wal-Mart supercenter, only 63 individual food prices, in 10 food categories, were included in the calculation of price indexes for purposes of comparison. The omitted food categories were other meats and miscellaneous food items. Information concerning per capita consumption or household food expenditures on these two food categories was not available. Specifically, the following three index numbers were constructed, based on the price data collected from the area supermarkets.

- (1) *Average food price per unit weight*—This index is constructed by averaging prices of each selected food item on a unit weight basis (for example, per pound). This is a simple and unweighted average food price index. The index provides an overall summary of food price movements for each traditional supermarket before and after the opening of the Wal-Mart supercenter.
- (2) *Consumption weighted average food price index*—This index is constructed by multiplying the average price of each food item in a specific store by the share of per capita consumption of selected food items (Table 1). The per capita food consumption is used as a weight to compute average food prices for each supermarket. This index provides a means to measure the impact of food price changes on the average food costs of a consumer's consumption basket by supermarket.
- (3) *Expenditure weighted average food price index*—This index is constructed by multiplying the average food price of each item in unit weight by the average food (at home) expenditure share of selected items (based on the food expenditures of households in the southern region of the United States). This weighted index is designed to provide a food cost measurement that reflects the average proportion of food dollars that consumers spend for food at home by store. The 1998 average food at home expenditures and their budget shares for households in the southern region are presented in Table 1.

Table 1. Average Annual U.S. Per Capita Food Consumption and Household Food Expenditures in the South.

Food Category	Consumption		Expenditure	
	Quantities (lbs.)	Share (%)	Amounts (\$)	Share (%)
Cereal and bakery products	156.7	15.34	386	21.40
Red meats	115.3	11.29	360	19.96
Poultry	90.0	8.81	137	7.59
Fish	3.1	0.30	97	5.38
Eggs	30.8	3.02	32	1.77
Dairy products	201.63	19.74	273	15.13
Fresh vegetables	146.0	14.29	131	7.26
Fresh fruits	82.3	8.06	126	6.98
Processed fruits and vegetables	129.19	12.65	167	9.26
Sugar	66.5	6.51	95	5.27
Total food at home	1,021.52	100.00	1,804	100.00

Source: USDA (1997); BLS (2000).

It is assumed that supermarkets may change their pricing strategies, depending on the importance of a food item in the consumer's food basket. Thus, one would expect that the weighted food price indexes would represent the real cost of a consumer's food basket more accurately than a simple, unweighted price index.

Results and Discussion

The number of food items with lower average prices in each traditional supermarket is presented in Table 2. Among the six major supermarkets surveyed, Ingles, followed by Publix, reduced prices for most food items after the opening of the Wal-Mart supercenter in January 2000. Between January and April 2000, Ingles lowered prices for 42 out of 95 food items, more than 44 percent of the food items monitored. Publix also reduced prices on 40 items. In contrast, Bi-Lo reduced prices on only about 31 percent of the food items.

It is interesting to note that among the food categories, red meats had the largest number of food items with lowered prices in four supermarkets, followed by dairy products in two stores. This suggests that red meats and dairy products were the most popular food items that traditional supermarkets chose to reduce in price following the opening of a Wal-Mart supercenter. Given that red meats and dairy products account for more than 31 percent of per capita consumption and 35 percent of household food expenditures (Table 1),

such a competitive pricing strategy is to be expected. Similarly, in Table 2, local supermarkets are shown to frequently discount their prices on cereal and bakery products, which account for about 15 percent and 21 percent of consumption and expenditure shares, respectively.

Changes in weekly average food prices among selected local supermarkets are depicted in Figure 1. In general, average food prices among the surveyed stores appear to vary within a relatively small range, less than a 40¢/lb. difference between the highest- and lowest-price stores. Prior to the opening of the Wal-Mart supercenter, the traditional supermarkets could be divided into two groups according to pricing behavior. Harris-Teeter and Kroger belonged to the group that charged the highest average prices. It is obvious that Kroger and Harris-Teeter were competing with each other, particularly the Kroger store located on the west side near Harris-Teeter.

The second group included Bi-Lo, Food Lion, Publix, and Ingles, whose average food prices were generally 10–30¢/lb. below those of Harris-Teeter and Kroger. Although average food prices at Publix were about 20¢/lb. below those of Harris-Teeter and Kroger, price movements appeared to parallel those of Harris-Teeter and Kroger. Food Lion, a major supermarket competing with Kroger on the east side, also exhibited a price-movement pattern that was similar to that of Kroger and Harris-Teeter.

Table 2. Number of Food Items with Lower Average Prices After Opening of the Wal-Mart Supercenter, by Store.

Food Category (no. of items)	Publix	Ingles	Harris Teeter	Kroger	Bi-Lo	Food Lion
Cereal and bakery products (10)	4	6	3	4	5	3
Red meats (13)	4	8	8	6	3	8
Poultry (4)	3	0	1	2	0	3
Fish (2)	1	1	2	2	1	0
Eggs (1)	0	0	0	1	0	0
Dairy products (13)	9	7	4	4	8	4
Fresh vegetables (10)	3	4	6	5	1	6
Fresh fruits (9)	3	5	5	4	2	1
Processed fruits & vegetables (8)	4	2	3	3	2	2
Sugar (1)	0	1	1	0	0	0
Other meats (11)	6	3	2	0	3	4
Miscellaneous (13)	3	5	1	2	4	2
Total (95)	40	42	36	33	29	33

Note: The largest number in a column is highlighted by bold face.

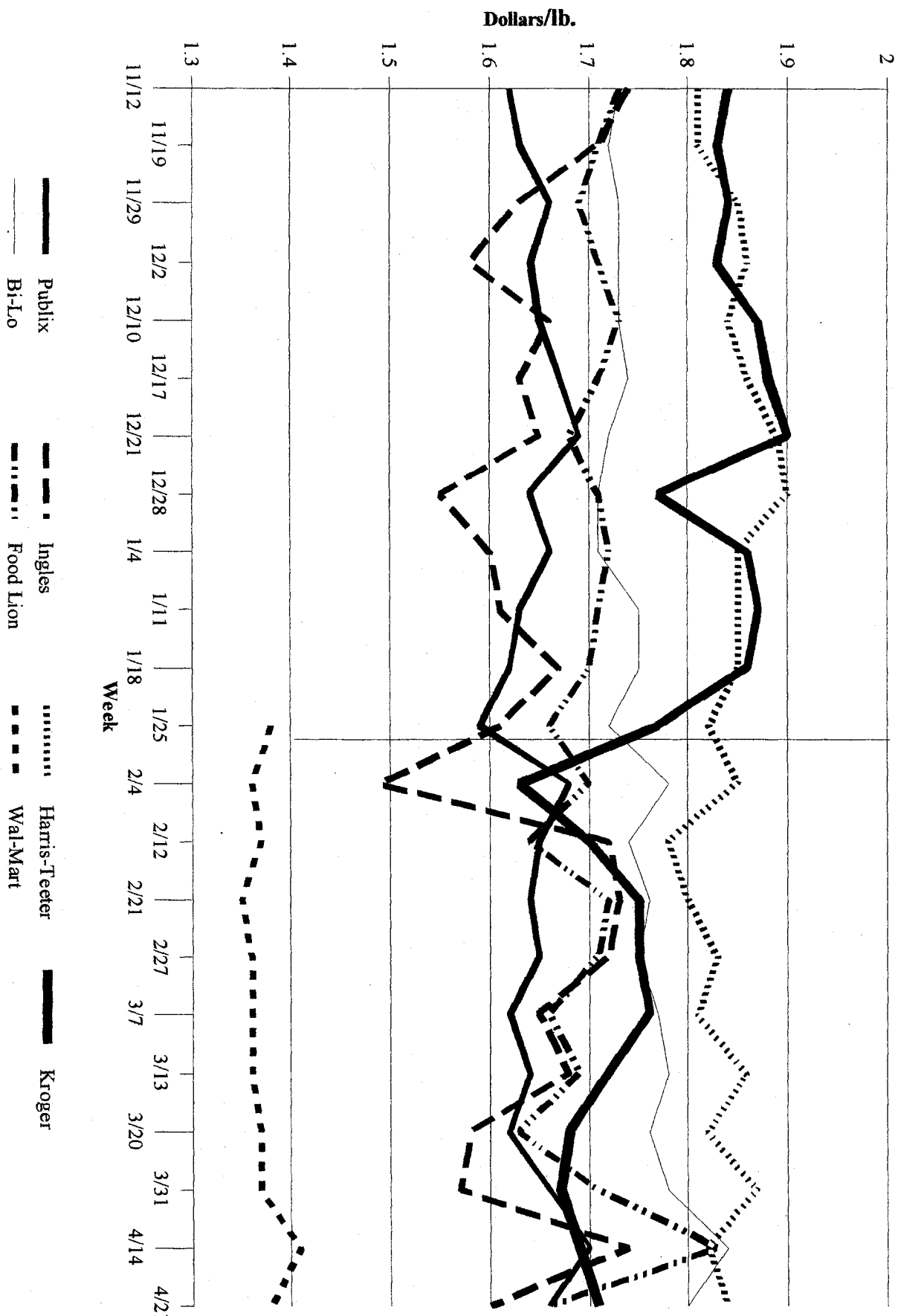


Figure 1. Unweighted Average Food Price per Pound.

Except for Ingles, price movements and average food price changes were relatively smooth with low variation. With anticipation of the grand opening of the Wal-Mart supercenter, average food prices dropped in every supermarket, without exception, a week prior to January 25, 2000. During the post Wal-Mart weeks, there is no doubt that Wal-Mart established itself as the low food-cost leader and had the overall lowest average food prices in Athens. Average food prices at the Wal-Mart supercenter were generally 20–50¢/lb. lower than those at the traditional supermarkets.

As shown in Figure 1, substantial price fluctuations with greater magnitudes are evident among other supermarkets as compared with the period before January 2000, while average food prices at Wal-Mart remained fairly stable. In particular, both Kroger and Harris-Teeter lowered prices to be more competitive with other supermarkets in the area. Although average food prices at Harris-Teeter stayed at the top of the chart, the gap in price level narrowed considerably. The magnitudes of price changes are most evident at Kroger, Ingles, and Food Lion.

Furthermore, it seems that Kroger adopted a more aggressive pricing strategy after the opening of Wal-Mart. Before January 2000, Kroger's prices were always above its competitors, Food Lion and Bi-Lo, on the east side. During the post Wal-Mart period, average food price per unit weight at Bi-Lo surpassed that at Kroger to become a relatively high food-price store, second to Harris-Teeter. The price level at Food Lion fluctuated with greater magnitude and was sometimes higher than the price level at Kroger.

The fact that average food price per unit weight at Harris Teeter and Bi-Lo was higher

than at other surveyed local supermarkets should be interpreted with caution, particularly with Bi-Lo stores. Bi-Lo, Harris-Teeter, and Food Lion usually offer discounted prices for customers who have a membership card. While Harris-Teeter and Food Lion run their membership discounts on selective items, Bi-Lo has an inclusive two-price system that offers differentiated prices to cardholders on all sale items in the store. In this study, special discount membership prices were not considered. This accounts, in part, for Bi-Lo's apparent lack of response in average food prices to the opening of the Wal-Mart supercenter.

A summary of changes in average food prices among the surveyed supermarkets before and after the opening of the Wal-Mart supercenter is presented in Table 3. While the average food price level decreased about 1.08 percent at Harris-Teeter, it remained as the highest average food price store at \$1.83/lb. after the opening of the Wal-Mart supercenter. Kroger, on the other hand, reduced its price level from \$1.84 to \$1.71/lb., a more than 7 percent decrease in average food prices.

It may be surprising to find that average food prices at some stores, especially Publix and Ingles, actually went up instead of down. However, Publix and Ingles maintained average food prices that were relatively and substantially lower than other supermarkets before the opening of the Wal-Mart supercenter. This would help to explain why, aside from location on the west side, their prices basically stayed the same after the opening of the Wal-Mart supercenter. In fact, average food prices at Publix and Ingles remained the lowest among the traditional supermarkets, even though the other supermarkets adjusted and realigned price levels after the opening of the Wal-Mart supercenter.

Table 3. Average Food Price Per Unit Weight by Store, November 1999 through April 2000.

Store	Overall Average Price	Average Price Before 1/25/00	Average Price After 1/25/00	% Change in Average Price
Publix	1.65	1.64	1.65	0.61
Ingles	1.64	1.64	1.65	0.61
Harris Teeter	1.84	1.85	1.83	-1.08
Kroger	1.78	1.84	1.71	-7.07
Bi-Lo	1.75	1.73	1.78	2.89
Food Lion	1.70	1.71	1.70	-0.58
Wal-Mart			1.37	

Note: The largest number in a column is highlighted by bold face.

A summary of average food prices is shown in Table 4 for selected food categories during the post Wal-Mart period among the surveyed stores. With the exception of cereal and bakery products (Food Lion), the Wal-Mart supercenter led every supermarket in offering the lowest price in every food category. Aside from Wal-Mart, Ingles led other supermarkets in offering lower prices in red meats, fresh fruits and processed fruits, and vegetables. While Wal-Mart offered the lowest price on poultry products (\$1.54/lb.), the average was only 1 cent above Publix's poultry price. Harris-Teeter appeared to feature low-priced fresh vegetables, and Food Lion appeared to feature low-priced dairy products.

Figures 2 and 3 present the average food prices weighted by per capita consumption and food expenditure shares. In general, there is little noticeable difference between the choices of weights, except that the expenditures weighted average price index

seems to be a little higher than the consumption weighted price index. The expenditures weighted index also appears to be smoother than the consumption weighted price index. It is interesting to note that, while the weighted indexes have generally reduced the large fluctuations in store prices observed with the unweighted index (Figure 1), the weighted indexes more clearly show Wal-Mart's big dip in food prices after the first week of opening for business. The store may have decreased its prices in response to the substantial reductions in prices offered by Kroger and Ingles.

Regardless of the methods used in the construction of average food price indexes, it is obvious from Figures 1–3 that the Wal-Mart supercenter always had the lowest overall average food prices of the local supermarkets that were surveyed. This suggests that traditional supermarkets in Athens are facing serious competition from the Wal-Mart supercenter.

Table 4. Average Price Per Unit Weight by Selected Food Category by Store, January–April 2000.

Food Category	Publix	Ingles	Harris Teeter	Kroger	Bi-Lo	Food Lion	Wal-Mart
Cereal & bakery products	0.42	0.41	0.44	0.43	0.41	0.35	0.37
Red meats	3.57	3.49	4.15	3.58	3.67	3.59	2.83
Poultry	1.55	1.77	2.21	2.29	2.23	2.02	1.54
Dairy products	4.51	4.44	4.61	4.49	4.42	4.39	3.92
Fresh vegetables	0.78	0.81	0.77	0.80	0.82	0.79	0.60
Fresh fruits	1.28	1.14	1.39	1.28	1.46	1.27	1.12
Processed fruits & vegetables	1.49	1.40	1.61	1.48	1.51	1.48	1.11

Note: The smallest number in a row (except for Wal-Mart) is highlighted by bold face.

Summary and Conclusions

The objective of this study was to determine the impact of the opening of a new Wal-Mart supercenter on food retail prices at supermarkets in Athens, Georgia. To accomplish this objective, food prices at six major local supermarkets were collected for a 22-week period from November 1999 through April 2000, divided into 11 weeks before and 11 weeks after the opening of the Wal-Mart supercenter. Three average food price indexes were constructed to measure the general price movements among the different stores.

The results clearly indicate that the opening of the Wal-Mart supercenter affected food prices in Athens. Although the pattern of responses may

have varied among different stores prior to the opening of the supercenter, all of the stores responded with a reduction in prices in anticipation of the new competition. Traditional supermarkets, such as Kroger and Ingles, that are in more direct competition with Wal-Mart continued to lower prices one week after the opening. In response, Wal-Mart also lowered prices to maintain price separation. After the first week of the opening, price variation among the surveyed stores seemed to resume to normal patterns, except that there were more frequent changes at a lower level.

This study shows that each surveyed supermarket had its own marketing and pricing strategies facing the opening of the Wal-Mart super-

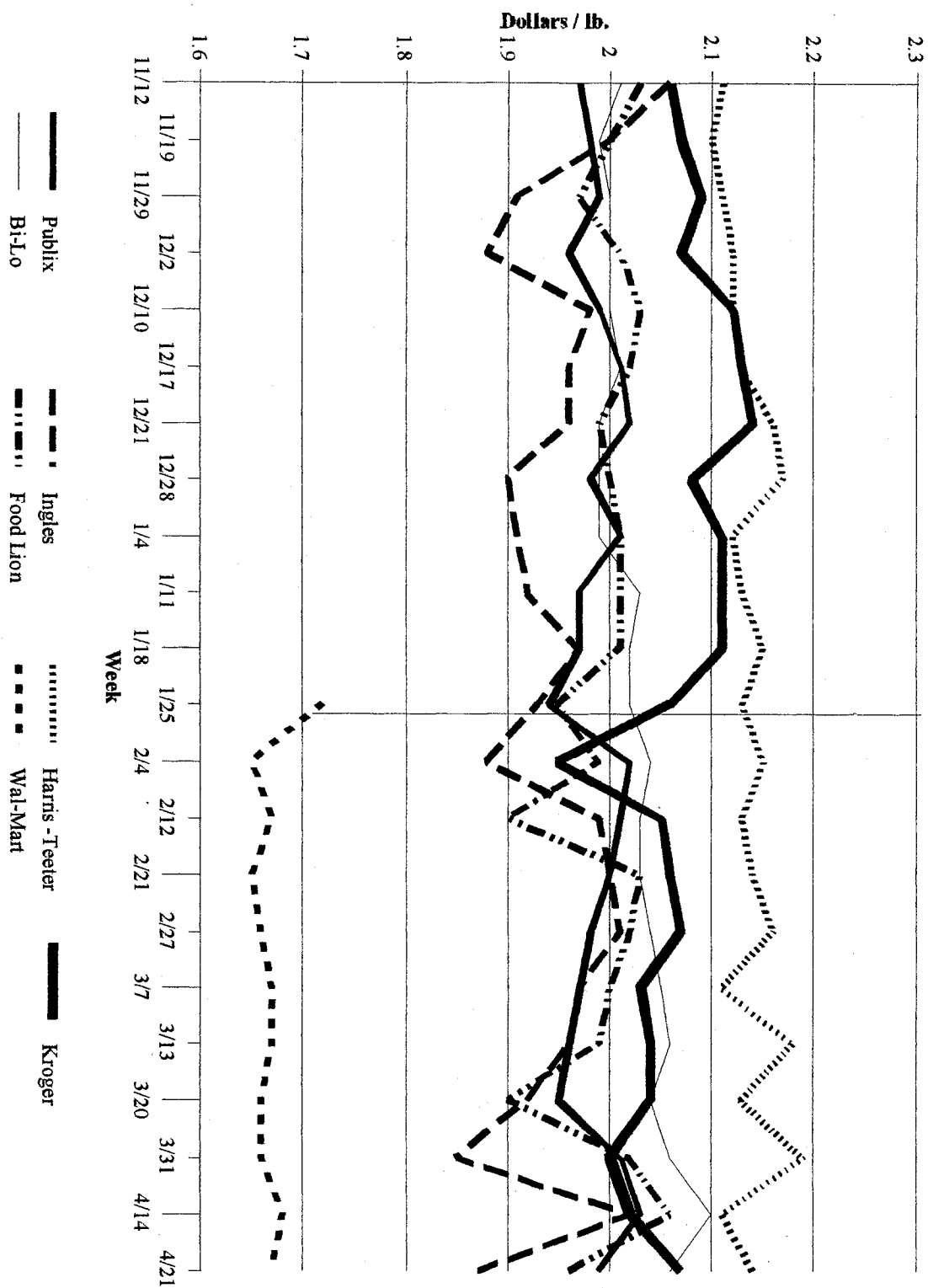


Figure 2. Consumption Weighted Average Food Price per Pound.

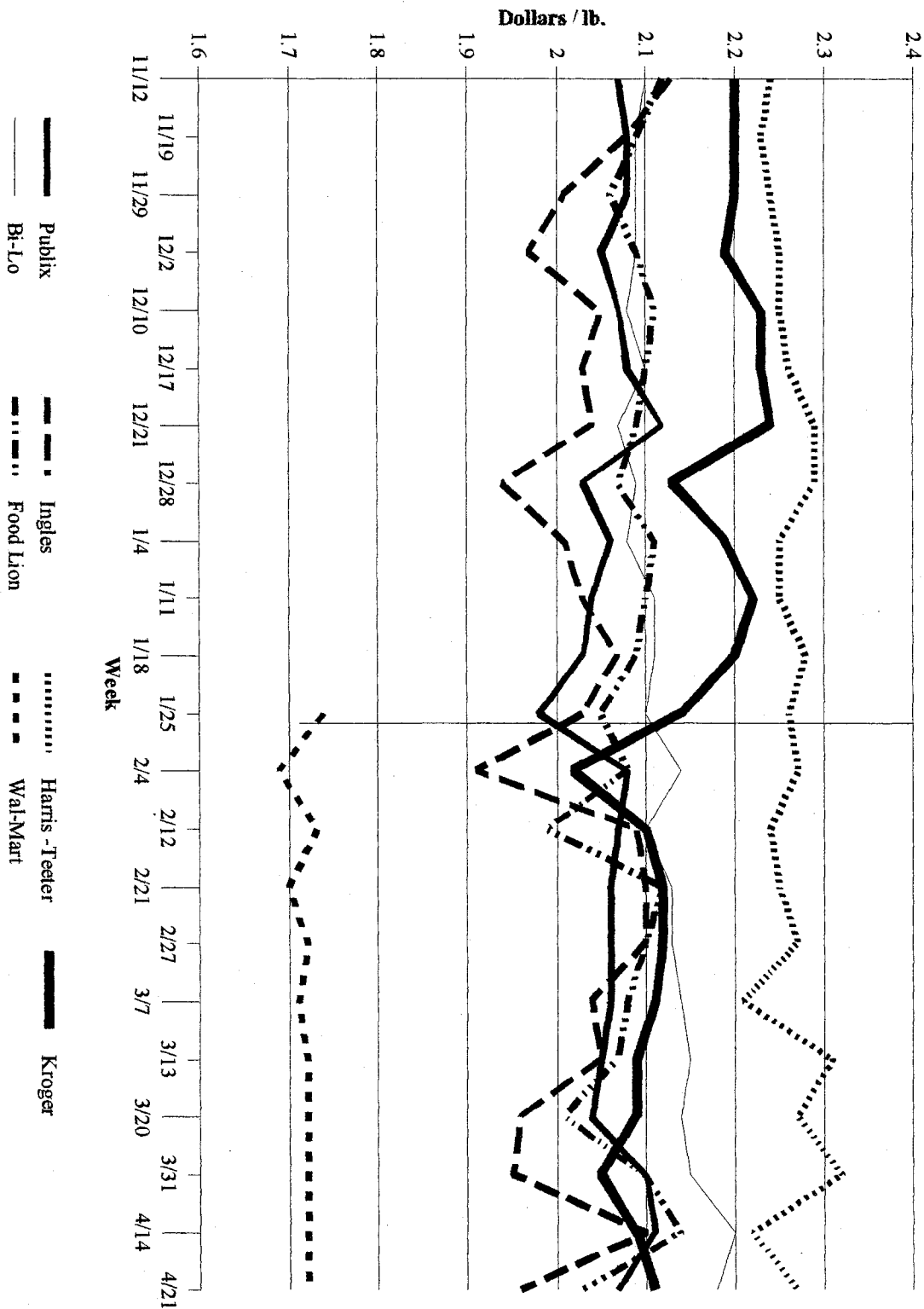


Figure 3. Expenditure Weighted Average Food Price per Pound.

center. Each supermarket tried to adopt a pricing strategy to face the challenge of low-cost competition from a mass merchandiser—the Wal-Mart supercenter. Location could be one of the factors that affects how a particular store responds to increasing price competition. Harris-Teeter is the supermarket with the highest food prices in the study area. It is located on the west side of Athens, where it is demographically upscale, surrounded with relatively affluent and high-income neighborhoods. Because of its upscale customers, Harris-Teeter seems to be able to continue in the market with relatively higher prices. It is, however, very competitive in its pricing of fresh vegetables.

Publix is a well-known national-chain supermarket. Located on the west side of Athens, it is the supermarket situated the farthest away from the new Wal-Mart on the east side of the city. Besides Wal-Mart, Publix offered the lowest average price for poultry products, and its prices of fresh vegetables, fresh fruits, and cereal and bakery products were positioned competitively in relation to other stores.

Ingles is also located on the west side of Athens. Average food prices at Ingles were generally lower than those of most other supermarkets before and after the opening of the Wal-Mart supercenter. Ingles appeared to adopt a pricing strategy, which involves frequent and substantial price changes. The magnitudes of its price variations were the largest among the supermarkets surveyed. It appears that Ingles used the low pricing of red meats, fresh fruits, processed fruits, and vegetables as a strategy to maintain its competitive position in supermarket food retailing.

Bi-Lo has two stores located on both sides of Athens. The Bi-Lo store on the east side is the closest in proximity to the Wal-Mart supercenter. Like Harris-Teeter, Bi-Lo appears not to have been responsive to the opening of Wal-Mart. The average food price trends of Bi-Lo and Harris-Teeter are very similar. Bi-Lo uses its membership card extensively and inclusively to offer special discount prices and to promote sales, which help

to account for the apparent lack of price responsiveness observed during the survey period.

Kroger has stores on both the east and west sides of Athens. Average food prices at Kroger were relatively higher than those of other supermarkets, especially prior to the opening of the Wal-Mart supercenter. However, Kroger responded with substantial reductions in food prices after the opening of the Wal-Mart supercenter. While Kroger had the most expensive poultry products in town, it lowered its average food price level to be competitive with that of Wal-Mart and the other supermarkets.

Food Lion is located between the eastern Kroger store and the Wal-Mart supercenter. Food Lion maintained a lower price level than Kroger did in almost every food category. The opening of the Wal-Mart supercenter appears to have placed additional and increasing pressures of price competition between Food Lion and Kroger, primarily because Kroger lowered its prices to compete with Wal-Mart. As a result, the gap in food price level between Food Lion and Kroger almost disappeared—particularly with respect to food categories, such as red meats, fresh vegetable and fruits, and processed fruits and vegetables.

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