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GOVERNMENT

THE PROFIT AND PRICE PERFORMANCE OF LEADING FOOD CHAINS, 1970–74

A STUDY

PREPARED FOR THE USE OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

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LETTERS OF TRANSMITTAL

APRIL 8, 1977.

To the Members of the Joint Economic Committee:

Transmitted herewith is another study prepared as part of the Committee's broad examination into causes of inflation in our economy. The study is entitled, "The Profit and Price Performance of Leading Food Chains, 1970–74".

The study was prepared by the members of the University of Wisconsin Food System Research Group of NC 117, a 17 University consortium conducting the North Central Regional Research Project on the Organization and Control of the U.S. Food System. Principal authors are Dr. Bruce W. Marion, Dr. Willard F. Mueller, Dr. Ronald W. Cotterill, Dr. Frederick E. Geithman, and Dr. John R. Schmelzer.

The study focuses on the impact which retail food market structures have on inflation. The study concludes that retail food chain prices are significantly higher in markets where few firms compete than in more competitive markets. It also found a strong relationship between food retailing market structure and food chain profits.

These results warrant unusual attention because of the data utilized in their development. It was confidential food chain price and profit data extensively analyzed by computer. I believe members of the Joint Economic Committee and other Members of Congress will find the study useful and informative.

The views expressed in this study are those of the authors and do not necessarily represent the views of the committee members or the committee staff.

Sincerely,

RICHARD BOLLING,
Chairman, Joint Economic Committee.

APRIL 6, 1977.

Hon. RICHARD BOLLING,
Chairman, Joint Economic Committee, Congress of United States,
Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is a study entitled, "The Profit and Price Performance of Leading Food Chains. 1970–74". The study was initiated as part of a broad inflation study in 1974 for the use of the Committee under the chairmanship of the late Honorable Wright Patman. In an effort to acquire more accurate and reliable data than available from any public or private source, divisional profit, cost and price data was subpoenaed from 17 of the largest national food retail chains. The subpoenas covered the period January 1970 through September 1974. Following initial hearings in December, 1974, based on preliminary data, the study was initiated. Acquisition of data under subpoena continued into the summer of 1975. The study has been underway since that time.

The study was authored by Dr. Bruce W. Marion, Dr. Willard F. Mueller, Dr. Ronald W. Cotterill, Dr. Frederick E. Geithman, and Dr. John R. Schmelzer. It explores the relationship during 1970–74 between retail grocery prices and profits in the local markets and the degree of competition in these markets between food chain stores. A voluminous amount of data were examined which indicated that the level of food prices and chain store profits are strongly related to the structure of local markets. High grocery prices and profits were generally found in concentrated markets—markets where relatively few firms competed.

This study is pathbreaking in that no government or private study of food chains exists which approaches the breadth of data or the depth of sophisticated computer regression analysis utilized in this study. Because of the sensitive nature of this data, the committee endeavored to preserve the anonimity of firms and cities examined by the study.

The views expressed in this study are those of the authors and do not necessarily represent the views of the committee members or the committee staff.

Sincerely,

JOHN R. STARK,
Executive Director, Joint Economic Committee.

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The authors gratefully acknowledge the contributions of several individuals and organizations. The Joint Economic Committee was responsible for obtaining much of the data used in the study. Various members of its staff, especially Mr. George Tyler, provided valuable assistance throughout the study.

Ms. Tonya Kins and Ms. Julie Caswell were primarily responsible for organizing and tabulating merger data on food retailing. Ms. Linda Van Kylen, Mrs. Heloisa Scholl and Mrs. Karen Isensee carried the heavy secretarial task of preparing the several drafts of the report.

The major financial support for the project was provided by the North Central Regional Project, NC 117, "Organization and Control of the U.S. Food System", and the College of Agriculture and Life Sciences, University of Wisconsin. The Joint Economic Committee provided part of the computer costs of the study.

THE PROFIT AND PRICE PERFORMANCE OF LEADING FOOD CHAINS, 1970–74

By Bruce W. Marion, Willard F. Mueller, Ronald W. Cotterill, Frederick E. Geithman, *and* John R. Schmelzer*

SUMMARY AND CONCLUSIONS

This study focuses on the organization and competitive performance of one vital part of the U.S. food system—the food retailing industry. In particular, the study examines the profit and price performance of large U.S. grocery chains to determine whether the competitive environment of these chains has an important influence on their profit and price performance.

There has been a long-term trend towards larger and fewer stores and increased concentration in food retailing. Grocery chains (firms with 11 or more stores) have gained a steadily increasing share of grocery store sales—from 34 percent in 1948 to 57 percent in 1972. The 20 largest chains—most of which were included in this study—accounted for 37 percent of grocery store sales in 1972. Taken together with increasing concentration among grocery wholesalers, the result is a relatively small and declining number of buyers who largely determine which products will gain access to supermarket shelves.

The share of grocery store sales held by the largest retailers in metropolitan areas has also gradually but steadily risen. This is particularly important since competition among retailers as sellers occurs in local markets rather than in regional or national markets. In 1972, the largest four grocery retailers in 194 metropolitan areas held an average of 52 percent of the grocery sales. In one-fourth of these metropolitan areas they held 60 percent or more of sales.

Analysis of changes between 1967 and 1975 in the share of grocery store sales held by the top four firms (CR_4) in 86 metropolitan areas revealed that the following factors were positively related to changes in market concentration: (1) the number of large chains in a market; (2) entry of large chains by internal growth; (3) entry by large chains and by large nongrocery store firms through acquisition of an existing grocery retailer; (4) horizontal mergers that increase the market share of the top four retailers in a market. Thus, when other things are held constant, these factors tend to stimulate an increase in market concentration. The 1967 market share of A & P was negatively related to changes in CR_4, reflecting A & P's general loss in market share over the period. Two other factors found to be nega-

*The authors are members of the Food System Research Group located at the University of Wisconsin-Madison. This group is part of NC 117, a North Central Regional Research Project on the Organization and Control of the U.S. Food System.

tively related to change in four-firm concentration were market size, and the four-firm concentration level in 1967.

By most standards, the 1970–74 period included in this study was an atypical one for grocery retailers. The combination of wage-price controls, mercurial food prices, a recession concomitant with double-digit inflation, and A & P's WEO program subjected the grocery industry to severe shocks, particularly during 1972–73. The pretax profit-sales ratio of grocery chains reached a low of 0.94 percent in 1972–73, less than half the typical profit level during the late 1960s. Aftertax profits as a percent of stockholder equity for large chains dropped from 12 or 13 percent in the late 1960s to about 4 percent in 1972 and 1973, and rose thereafter.

These data provide no evidence of widespread "profiteering" by grocery chains during 1970–1974, and especially during 1972–1973. However, these averages tell us little about the variations in profits and prices that occur from one city to another, or from one chain to another; indeed they obscure such variations. The analytical results which make up a major portion of this report provide some useful insights into the role that competitive factors play in determining the level and variations in profits and prices across markets.

Impact of Competition on Profits and Prices

The data submitted to the Joint Economic Committee by grocery chains included in this study allowed an analysis of the impact of competitive forces on:

The profit-sales ratio of 12 grocery chains in 96 different divisions.

The profit-sales ratio of six grocery chains in 50 different metropolitan areas.

The grocery price level of three grocery chains in 36 metropolitan areas.

The difference in prices for national brands and private label grocery products in three chains in 36 metropolitan areas.

The analyses confirmed economic concepts that the degree of market concentration and the relative market position of firms are important determinants of market power. Statistical analysis of chain profitability revealed that profits are significantly higher in markets where a few firms control most grocery store sales. The analysis also found that when a chain has a dominant share of a market (measured as a percentage of the top four chains' share), it enjoys substantially higher profits than in markets where it has small shares. Thus, these two crucial market characteristics, relative firm market share (RFMS) and the level of four-firm concentration (CR_4), exert separate effects on a chain's profits. The statistical analysis found these variables to be statistically significant, that is, it is highly unlikely that these relationships were due to chance.

The level of prices in different markets was examined by computing the cost to consumers of a market basket containing 110 products. Prices were obtained from price comparison reports that had been conducted by the chains and were submitted to the Joint Economic Committee. The cost of the market basket in the highest priced SMSA was 14 percent higher than in the lowest priced SMSA.

Statistical analysis of grocery prices in 36 metropolitan areas indicated a highly significant positive relationship between price levels and both relative firm market share (RFMS) and four-firm concentration (CR_4). That is, other things held constant, as the relative market share of a firm and/or the four-firm concentration of a market increased, grocery prices also increased. Thus, the analysis of prices confirms the findings of the profit analysis that both market concentration (CR_4) and relative firm dominance (RFMS) confer market power on a grocery retailer.

On average, the companies included in the price analysis charged 12 percent more for 46 national brand products than for comparable store brands. The spread between store and national brands was also found to be significantly related to the structure of the market. As relative firm market share increased, the percentage spread between the price of national brands and store brands tended to increase. That is, as a firm's market power increased, the prices of both national and store brands rose, but the former rose more rapidly.

The overall influence of RFMS and CR_4 on prices and profits of individual chains can be estimated from our statistical results. Table I.1 shows estimates of grocery price levels and pretax profit-to-sales ratios for different combinations of RFMS and CR_4. These estimates indicate the independent influence of these two measures of competition when all other variables included in the analysis are held constant.

TABLE I.1.—ESTIMATED INDEX OF GROCERY PRICES AND PRETAX PROFIT-TO-SALES RATIOS ASSOCIATED WITH VARIOUS LEVELS OF MARKET CONCENTRATION AND RELATIVE FIRM MARKET SHARE

	4-firm concentration ratio (CR_4)							
	40		50		60		70	
	Index of grocery prices [1]	Profits as percent of sales [2]	Index of grocery prices	Profits as percent of sales	Index of grocery prices	Profits as percent of sales	Index of grocery prices	Profits as percent of sales
Relative firm market share (RFMS):								
10	100.0	0.37	101.0	0.99	103.0	1.22	105.3	1.28
25	100.8	1.15	101.8	1.77	103.7	2.00	106.1	2.06
40	102.4	1.93	103.4	2.55	105.4	2.78	107.7	2.84
55	103.6	2.71	104.5	3.33	106.5	3.56	108.9	3.62

[1] The estimated grocery basket cost for each combination of RFMS and CR_4 was calculated using equation 1g, table 3.3 and holding other independent variables at their respective means. The index was constructed by setting the grocery basket computed for RFMS=10, CR_4=40 equal to 100.

[2] Profits as a percent of sales were estimated for each combination of RFMS and CR_4 using equation 1d, table 2.7 introducing all other variables except API at their means; the binary variable API was introduced with a value of 1. Equation 1d was developed using the average division profit levels for the 3 years 1970, 1971, and 1974. The grocery price models were based upon 1974 prices.

The table shows an index of estimated grocery prices; when CR_4 is 40 and RFMS is 10, the index equals 100. At this combination of CR_4 and RFMS, pretax profits are estimated at .37 percent of sales. At CR_4 is 40 and RFMS is 25, the combination we have selected as the competitive norm, the index of grocery prices is 100.8; estimated pretax profits are 1.15 percent of sales.

It is instructive to compare these estimated prices and profits with those when CR_4 is 70 and RFMS is 55. The index of grocery prices is 108.9 an increase of 8 percent from where CR_4 is 40 and RFMS is 25.

Estimated firm profits are 3.62 percent, an increase of 2.47 percentage points. The change indicated in profit levels thus accounts for only 31 percent of the change in price levels.

It should be emphasized that average chain profits during the 1970–74 period were depressed by a combination of unusual factors. Nonetheless, this analysis indicates that chains holding dominant market positions in highly concentrated metropolitan areas enjoyed substantial profits. The profits shown in Table I.1 are expressed as a percentage of sales before taxes. The relevant profit measure in evaluating profits of firms in one industry relative to those in another are profits expressed as a percentage of stockholders' investment. Pre-tax profits of 3.62 percent of sales (the highest shown in the table) translate to aftertax profits of over 20 percent of stockholders' investment. This was far above the average profits of all chains during the 1970–74 period, and well above the average of all but the most concentrated American industries.

Caution must be exercised in making direct comparisons between the price and profit analysis since they are based on different samples. Nonetheless, they provide no support for the notion that high market concentration and/or high individual chain market shares result in higher profits because of lower costs. Rather, the analysis indicates the opposite. As RFMS and/or CR_4 increase, a chain's prices increase more rapidly than its profits—suggesting that costs also increase. Other studies have found that market power stimulates inflated costs and inefficiencies. The above results suggest that this is also true in food retailing.

Extent of Monopoly Overcharges

The study findings provide strong evidence that "monopoly overcharges", i.e., prices above those in competitive markets, are likely in markets that are dominated by one or two firms and/or where sales are highly concentrated among the largest four firms. Using the structural combination of CR_4 of 40 and RFMS of 25 as the competitive norm, monopoly overcharges by the largest four firms in the 32 sample SMSAs were estimated at 1.6 percent of sales or $161 million in 1974. If these findings are typical of the situation in all SMSAs, then the national monopoly overcharges by the four largest firms in each SMSA are estimated to total $662 million for 1974. Since this estimate includes the sales of only the four largest retailers and only sales in SMSAs, it may well understate the national overcharge that is due to non-competitively structured markets.

Overcharges vary greatly among cities. For example, a selected midwestern case market has a relatively competitive market structure and only $1.6 million in estimated monopoly overcharges by the largest four firms (0.3 percent of their sales). By contrast, a comparably sized but highly concentrated eastern market with two dominant firms, had estimated 1974 monopoly overcharges by the top four chains of $83.0 million or 6.9 percent of their sales. This illustrates the impact on prices consumers pay for food when a market becomes highly concentrated and has one or more dominant firms.

These findings do not necessarily imply that all grocery chains realize excessive profits. Average profit rates of grocery chains during

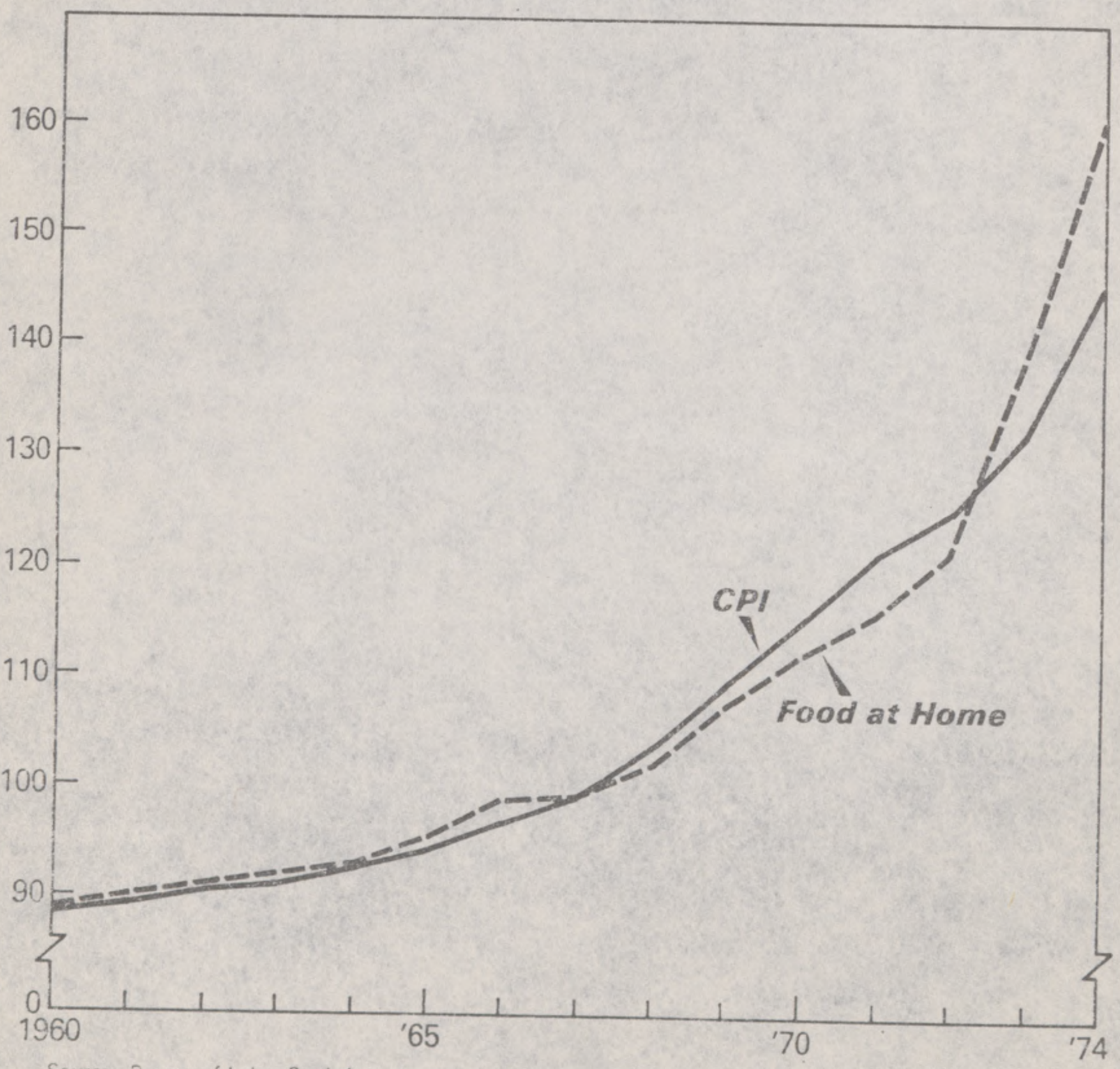
1970–74 were below those of many industries. It seems unlikely, however, that the generally depressed profit levels of this period will continue. During part of the period studied profits were depressed by the price control program and by the A & P WEO program. Since 1973, average profit margins have risen, and there is no reason to expect that they will not continue to improve. This analysis found that despite the unusual combination of circumstances depressing profits during most of the period studied, in some markets firms had sufficient market power, either due to their individual dominance or the high level of concentration in the market, so that they enjoyed considerable discretion over pricing. In these situations, market forces did not protect consumers from excessive prices and profits.

Whether or not excess profits are achieved by the industry as a whole, performance found by this study indicates substantial variation in profits and prices among markets. At the very least, one might conclude that firms in markets where considerable market power exists subsidized their operations in more competitive metropolitan areas. If so, some consumers benefitted at the expense of others. It appears, however, that consumers in the least competitive markets were also footing the bill for inefficiencies and excessive costs that so frequently are the handmaidens of shared monopoly situations. In addition, some competitors, and perhaps competition, may have been injured in markets where large chains subsidized their operations.

Chapter 1. OVERVIEW OF FOOD RETAILING INDUSTRY

From 1972 to 1974, food prices rose at the most rapid rate in recent history (Figure 1.1). This study does not attempt to analyze just this inflationary episode which was part of a larger pattern of national and international inflation. Rather, the study focuses on the competitive organization and performance of the food retailing industry. It first examines the nature and changing market structure of the industry and then analyzes the influence of the competitive environment of local markets on retail grocery store prices and profits. The latter analyses appears in Chapters 2, 3 and 4. This chapter examines some general aspects of the food industry, particularly changing market concentration and profit patterns.

Figure 1.1. Consumer Price Index and Food at Home Component, 1960-1974, (1967 = 100).

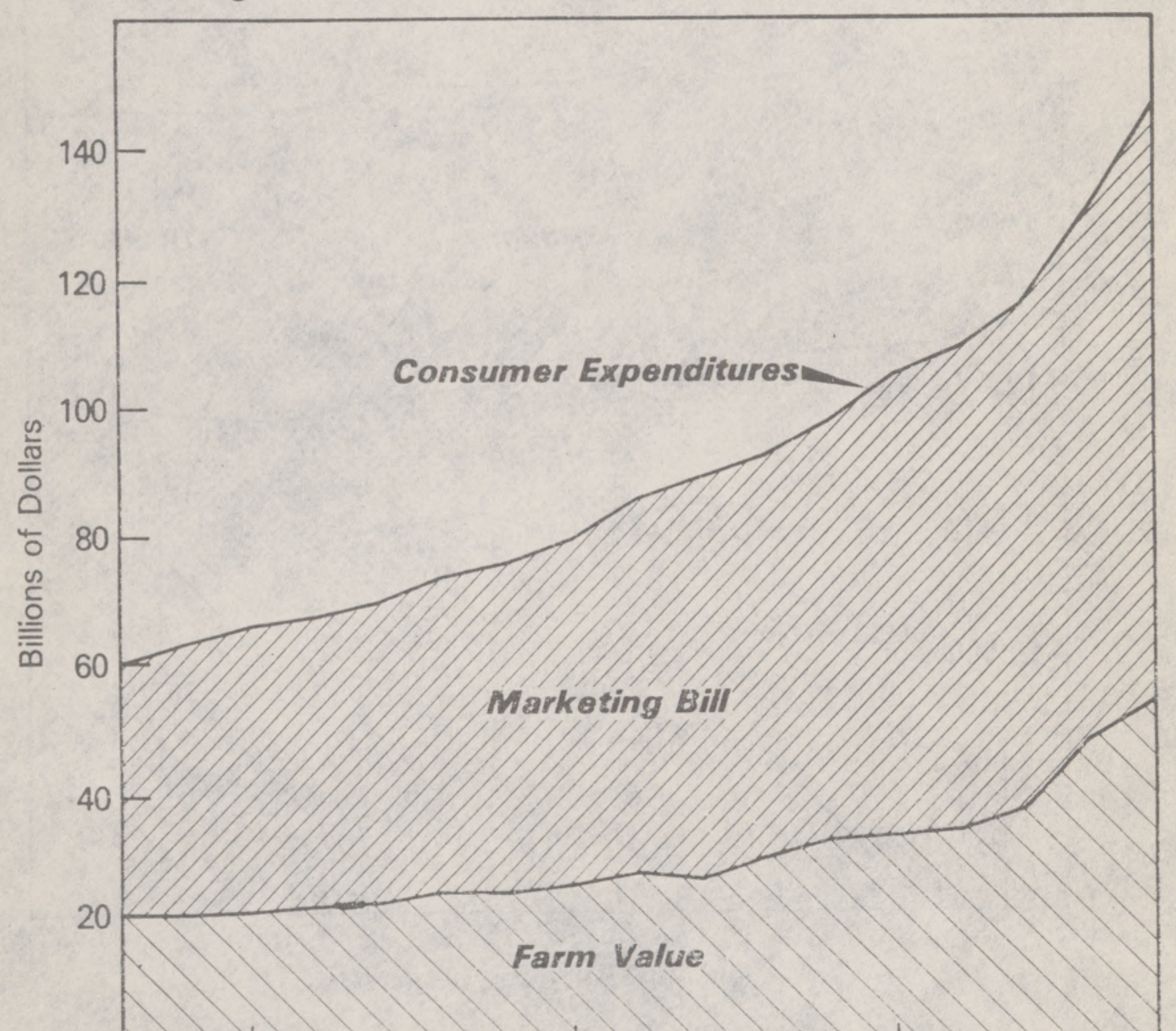


Source: Bureau of Labor Statistics.

The U.S. Food System

In 1974, U.S. consumers spent some $148 billion for foods produced on U.S. farms. Payments to U.S. farmers accounted for 38 percent of the total; the remaining 62 percent went to the various intermediary marketing agencies involved in transporting food from farm to consumer (Figure 1.2).

Figure 1.2. Consumer Expenditures, Farm Value & Marketing Bill, 1958-1974.



Source: *Marketing & Transportation Situation*, ERS, USDA, MTS-198, August 1975, p. 18.

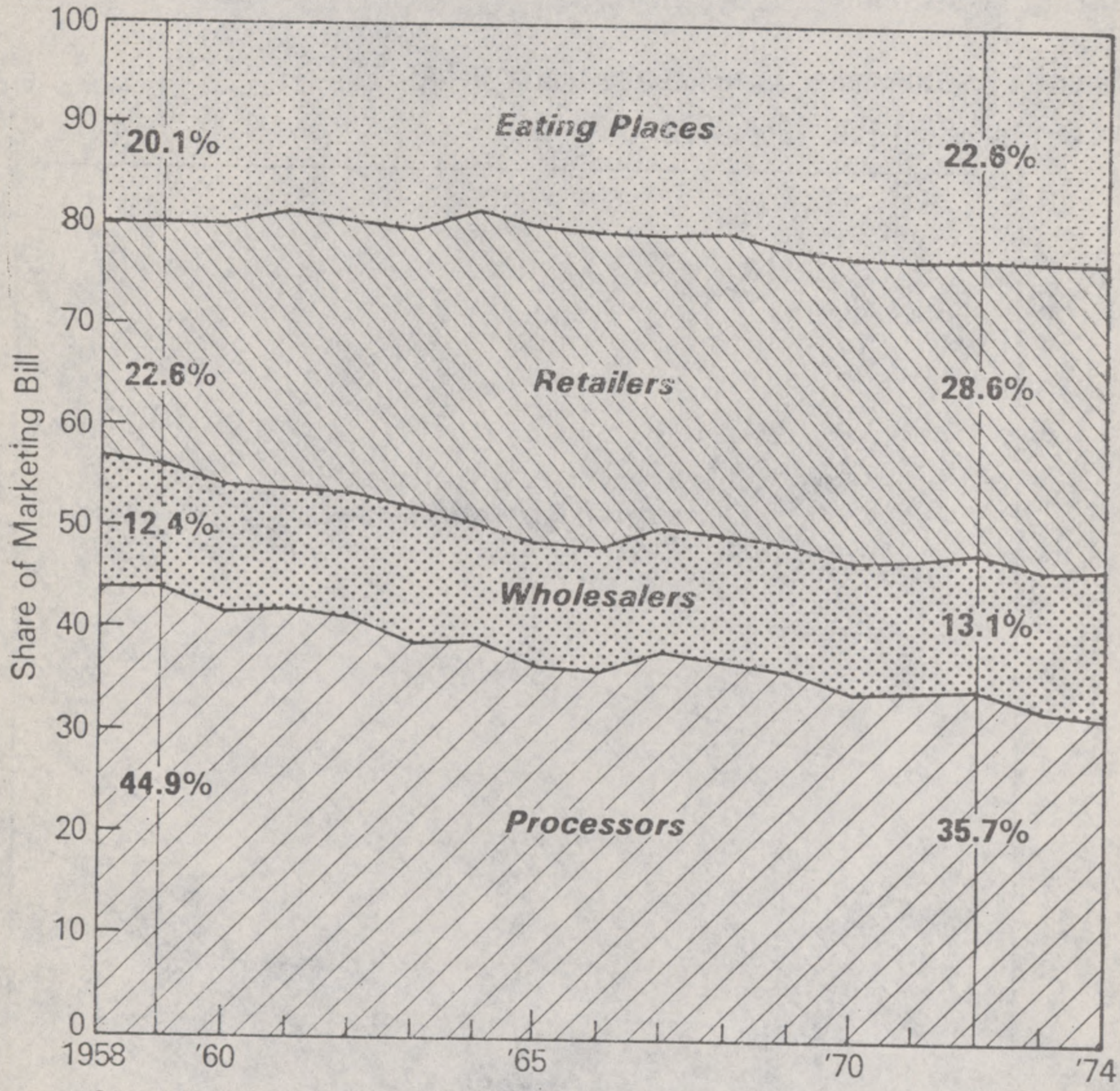
Food processors have historically accounted for the largest portion of the "marketing bill." However, their share has declined markedly during recent years while the shares represented by food retailers, wholesalers and eating places have expanded (Figure 1.3). Between 1958 and 1974, the food processors' share of the marketing bill declined by one-fourth, to 33.3 percent. Conversely, the share held by food retailers expanded by one-fourth during this period to 29 percent.[1] During the 17-year period, modest increases also occurred in the

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[1] Marketing and Transportation Situation, Economic Research Service, USDA, MTS 198, August 1975, p. 36.

food wholesalers' and eating places' share of the marketing bill. Thus, for whatever reasons, those agencies most closely linked with the consumer have accounted for a steadily increasing portion of the marketing bill for U.S. farm foods.

Figure 1.3. Distribution of Food Marketing Bill, 1958-1974.



Source: *Marketing & Transportation Situation*, ERS, USDA, August 1975, p.36.

Food Retailing

Retail food stores realized sales of $120 billion in 1974, or about one-fifth of all retail sales in the U.S.[2] The vast majority of these food sales—nearly 93 percent—were made by retail grocery stores, while speciality food stores (e.g., meat markets, confectionary stores, etc.) accounted for the remaining 7 percent of retail food store sales.[3]

The emergence of the grocery store as the primary food retailing unit in the U.S. can be traced to the introduction of the supermarket in the 1930s. The supermarket, which combined self-service, cash and carry and a broad selection of products under one roof revolutionized the U.S. food retailing industry and provided the impetus for fewer

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[2] Bureau of Census, Current Business Reports, 1974 Annual Retail Trade Report, U.S. Government Printing Office, Washington, D.C., September 1975.

[3] "42d Annual Report of the Grocery Industry," Progressive Grocer, April 1975, p. 56.

but larger retail food stores. This trend has continued to the present. The period, 1960–1974, is illustrative; over the period, the number of grocery stores declined by one-fourth while the average annual sales per grocery store more than tripled to about $650,000.[4]

In 1974 supermarkets [5] made nearly 72 percent of all grocery store sales,[6] although they represented only about 16 percent of all grocery stores. Corporate chains operated nearly two-thirds of these supermarkets and had annual sales of about $3 million per supermarket. Independent grocers operated the remaining one-third of the supermarkets as well as over 80 percent of the smaller grocery stores (annual sales less than $1 million).[7] Although these smaller stores (including convenience stores) accounted for 28 percent of total grocery store sales in 1974, they compete only indirectly with supermarkets. Thus, although independently owned and operated grocery stores accounted for 45 percent of total grocery store sales in 1974, their share in the important supermarket "submarket" was only about one-third.

Retail Grocery Chains

Large retail grocery chains [8] rank among the nation's leading retailers. In 1974, the largest grocery chain (Safeway) had company sales in excess of $8 billion and the 15 largest grocery chains each reported sales exceeding $1 billion. These and other chains have become the dominant institutional force in food retailing.

Retail grocery chains have grown in relative importance since they became commonplace in the 1930s. Between 1948 and 1972, the chains' share of grocery store sales rose from 34 to 57 percent (Figure 1.4).[9] The share held by smaller chains (those chains operating 11 to 100 stores) increased from 7.0 percent to 17.4 percent during this period; large chains (operators of more than 100 stores) accounted for 27.4 percent of grocery store sales in 1948 and 39.6 percent in 1972.

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[4] Ibid., p. 60.

[5] A supermarket is defined as any grocery store, chain or independent, with an annual sales volume of $1 million or more.

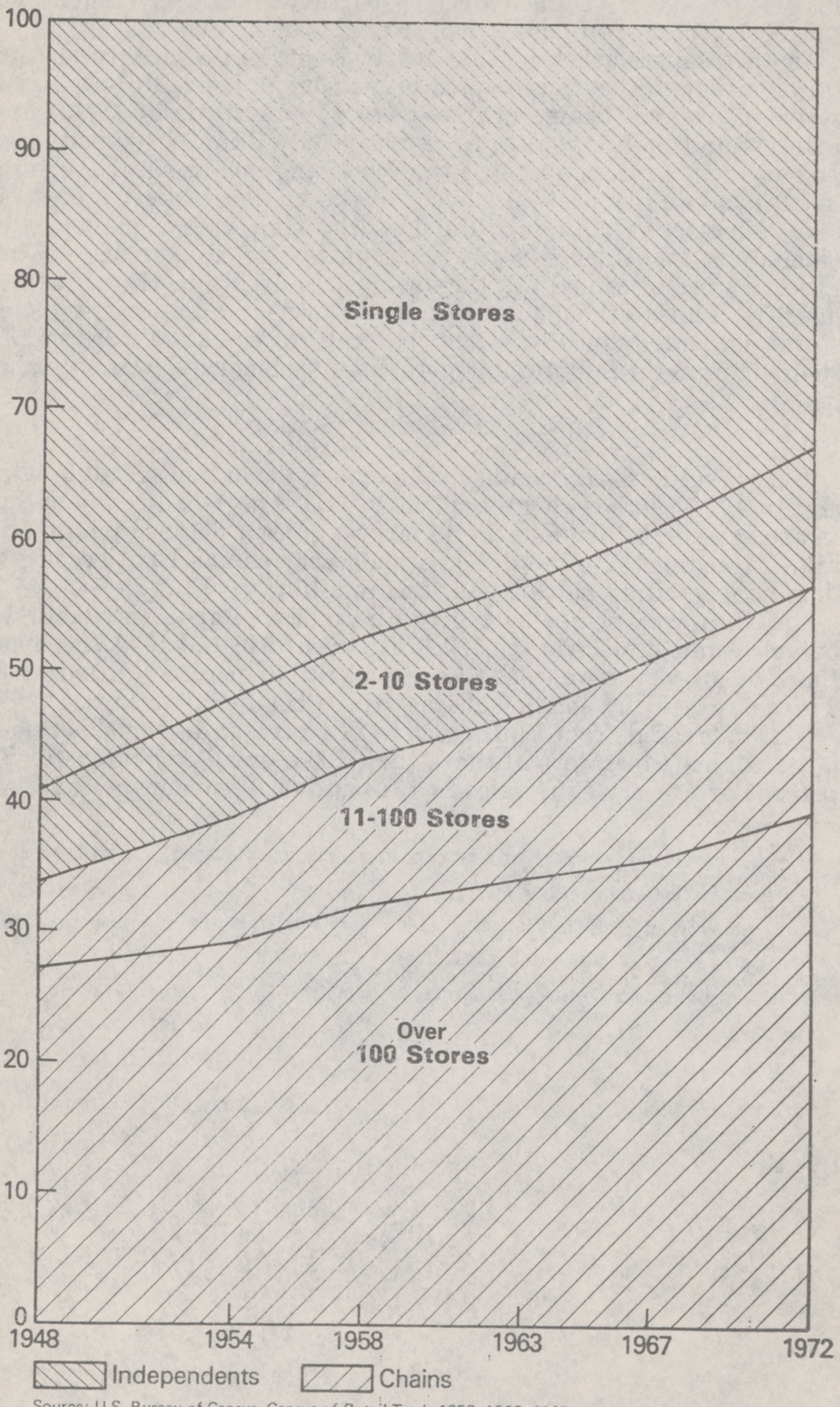
[6] Progressive Grocer, op. cit., p. 60.

[7] Ibid., p. 59.

[8] A retail grocery chain is defined as 11 or more retail grocery stores operated under common ownership.

[9] Estimates for 1972, 1973, and 1974 from the Annual Retail Trade Reports for those years indicate that the chains' share of grocery store sales has remained stable at 56 percent. See Bureau of Census, Annual Trade Report, 1972, 1973, and 1974, op. cit.

Figure 1.4. Distribution of Grocery Store Sales by Size of Firm, Census Years, 1948-1972.



Source: U.S. Bureau of Census, *Census of Retail Trade* 1958, 1963, 1967 and 1972. (Summarized in Appendix Table A.1.)

Table 1.1 indicates the share of U.S. grocery store sales held by the largest 4, 8, and 20 chains from 1948 to 1975. One of the most dramatic changes was A&P's decline from 11.3 percent of the nation's grocery sales in 1954, to 4.9 percent in 1975. The remaining three of the four largest chains realized a steady increase in market share from 9.4 percent in 1948 to 13.0 percent in 1975. The most rapid growth during this period occurred among the 5th through 8th and 9th through 20th largest chains, which doubled and tripled their market shares, respectively (Figure 1.5).[10] The 20 largest chains increased their market share from 27 to 37 percent; without A & P, however, the other 19 largest chains grew from 16 to 32 percent of U.S. grocery store sales.

TABLE 1.1.—MARKET SHARE OF THE 20 LARGEST GROCERY CHAINS, CENSUS YEARS, 1948–75[1]

[In percent]

Rank of chains	Share of grocery store sales in—						
	1948	1954	1958	1963	1967	1972	1975
A & P	10.7	11.3	11.1	9.4	8.3	6.6	4.9
1st to 4th	20.1	20.9	21.7	20.0	19.0	18.1	17.9
5th to 8th	3.6	4.5	5.8	6.6	6.7	7.1	7.6
1st to 8th	23.7	25.4	27.5	26.6	25.7	25.2	25.5
9th to 20th	3.2	4.5	6.6	7.4	8.7	11.9	11.5
1st to 20th	26.9	29.9	34.1	34.0	34.4	37.1	37.0
Top 20 excluding A & P	16.2	18.7	23.0	24.6	26.1	30.5	32.1

[1] National Tea and Loblaw were treated as a single entity and their sales were combined accordingly. This adjustment placed National Tea-Loblaw 4th among the largest grocery chains in both 1963 and 1967 and 9th among the chains in 1972.

Source: 1948–63 estimates based upon U.S. Census as reported in National Commission on Food Marketing, "Organization & Competition in Food Retailing," June 1966. Estimates for 1967 are based upon the Federal Trade Commission, 1969 Food Retailing Survey and 1967 Census of Business, Retail Trade. Estimates for 1972 are based on data supplied by leading retail food chains and the 1972 Census of Business, "Retail Trade, Establishment and Firm Size," RC72–S–1, September 1975 and the 1972 Census of Business, "Retail Trade, Merchandise Line Sales," RC72–L, September 1975. Estimates for 1975 from "Weekly Digest," American Institute of Food Distribution, vol. 83, No. 27, July 3, 1976.

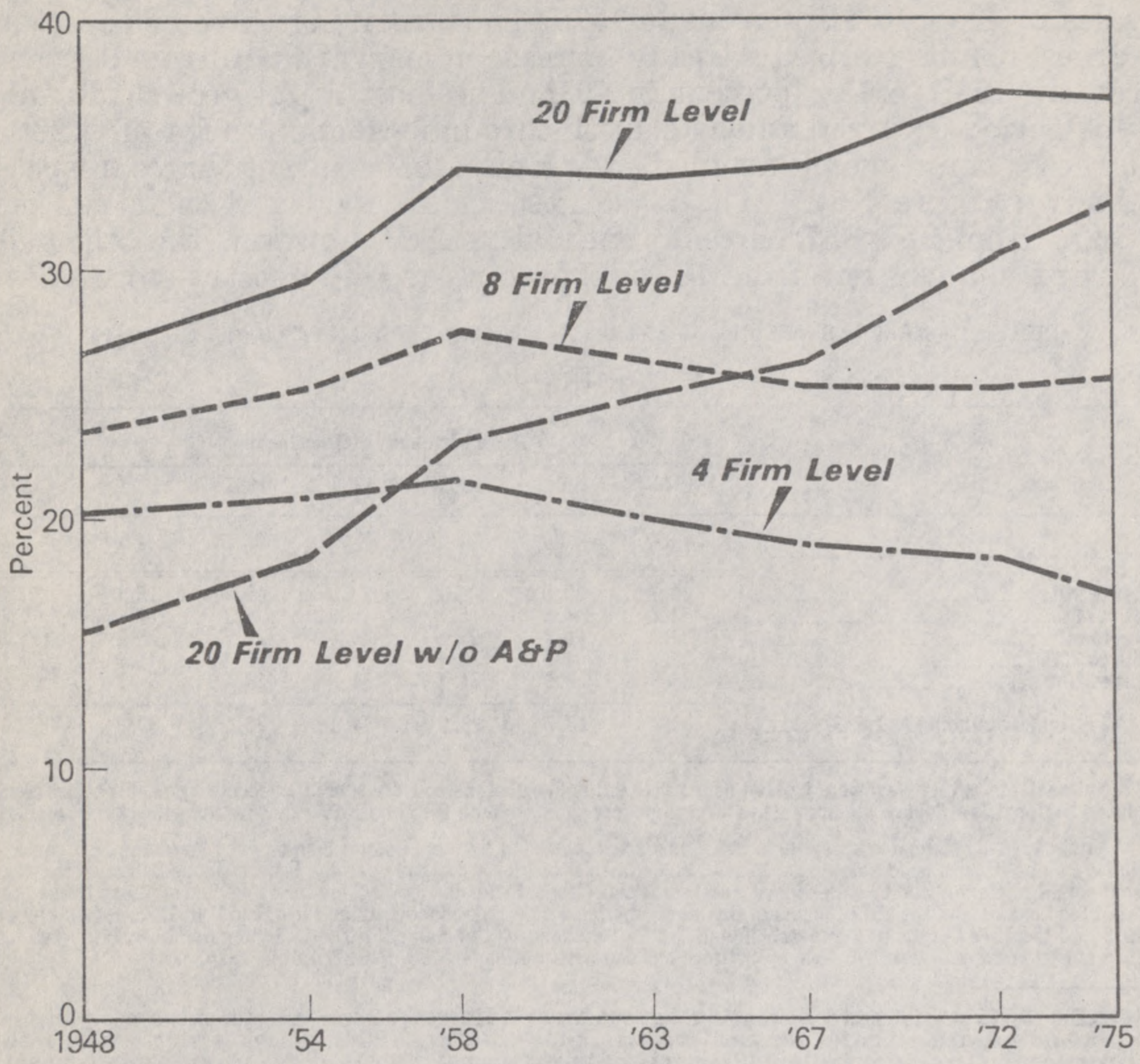
[10] The 1972 Census concentration figures were adjusted to make them more comparable with concentration figures for earlier years. Since the late 1960s, discount stores with food departments have grown in importance. Since Census collects data on an establishment rather than a company basis, in those cases where a discount store is classified as a department store (SIC 531), the total sales are credited to department stores sales and to the company operating the nonfood portion of the discount store. This poses problems in those instances where the food department is operated by a separate firm. Since large grocery chains frequently operate food departments within discount stores, their grocery store sales calculated by the Census would be understated, as would the total sales for all grocery stores (SIC 541). This results in an understatement of 4, 8, and 20 firm concentration figures.

Since data provided by companies as part of this study indicated their total sales from grocery stores, these figures were used to calculate national concentration ratios for 1972. Total grocery store sales in the U.S., as reported by Census, were adjusted by adding the grocery sales occurring in department stores, as reported in the Census report on Merchandise Line Sales. These adjustments resulted in the concentartion figure shown in Table 1.1 for 1972 whereas the 1972 Census of Retail Trade reports 4, 8, and 20 firm concentration ratios of 17.5, 24.4, and 34.7.

The 1972 concentration figures in Table 1.1 also differ from other published reports in which the total company sales of the largest 4, 8, and 20 grocery chains were used in the calculations instead of the grocery store sales of these firms. An estimated 5 to 10 percent of the sales of these companies stem from nongrocery store operations. Use of total company sales therefore overstates the level of concentration.

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Figure 1.5. Percentage of Grocery Store Sales Made by the 4, 8, and 20 Largest Retail Grocery Chains, 1948-1975.



Source: Table 1.1.

Nearly all large chains have performed the wholesaling function for their own stores for many years. Some chains are also integarted into food processing. However, except for certain commodities such as fluid milk where substantial increases in vertical integration by chains have occurred,[11] the available evidence suggests no strong overall trend toward either integration or disintegration by food chains (see Appendix Table A.6).

Many grocery chains have diversified during the last decade into other types of retailing such as drug stores and general merchandise stores. However, in 1973, grocery store sales still accounted for over 90 percent of the domestic sales of the largest 20 chains.[12]

Independent Retailers

Although chains have significantly increased their share of total grocery store sales over the past 50 years, independent food retailers continue to do a large share of grocery retailing.[13] In 1974, they accounted for 43 percent of grocery store sales in the U.S.[14]

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[11] Economic Report on the Dairy Industry, Staff Report to the Federal Trade Commission, U.S. Government Printing Office, Washington, D.C., March 1973.

[12] Estimated from Company Annual Report, Moody's Industrial Manual and other public sources.

[13] An independent is defined as an operator of fewer than 11 stores.

[14] 1974 Annual Retail Trade Report, op. cit., p. 3.

One of the primary factors that has contributed to the continued survival of independent food retailers has been the increase in the proportion that have affiliated with cooperative or voluntary wholesale organizations.[15] In 1972, affiliated independents did 86 percent of all independent grocery store sales (38 percent of U.S. grocery sales) while unaffiliated independents accounted for only 14 percent of the total. Average store sales for affiliated independents were $680,000, over 8 times larger than the $75,000 per store averaged by their unaffiliated counterparts.[16]

Although the number of stores operated by chains in 1972 was more than double the number operated in 1955, the opposite was true for independent grocers. Unaffiliated independents experienced a 57 percent decrease in store numbers during this period while the number of stores operated by affiliated independents declined roughly 35 percent.[17]

The slower rate of decrease in store numbers among affiliated independents was due, in part, to the movement of unaffiliated independents to the affiliated category.

Affiliated independents are served by various types of food wholesalers. Concentration in grocery wholesaling has increased markedly since 1948 (Table 1.2). The eight largest voluntary wholesalers together with the eight largest cooperative wholesalers accounted for 33 percent of U.S. sales by general-line grocery wholesalers in 1972, more than four times their share in 1948. Voluntary wholesalers have grown more consistently and rapidly than their cooperative counterparts (Figure 1.6).

TABLE 1.2.—SHARE OF GENERAL-LINE WHOLESALE GROCERY SALES, BY TYPE OF ORGANIZATION, CENSUS YEARS, 1948–72

[In percent]

Type of business	Share of sales in—					
	1948	1954	1958	1963	1967	1972
Affiliated:						
Voluntary groups:						
4 largest	2.2	5.2	7.4	9.7	11.2	14.9
8 largest	3.8	9.2	11.8	13.6	(1)	21.2
All voluntaries	(1)	(1)	38.5	45.7	47.4	[2] 29.9
Cooperative groups:						
4 largest	3.2	5.2	7.9	8.5	10.6	8.3
8 largest	4.2	7.3	10.6	12.4	(1)	12.2
All cooperatives	(1)	(1)	25.4	24.8	26.4	32.2
Nonaffiliated	(1)	(1)	36.1	29.5	26.2	[2] 37.9
Total	(1)	(1)	100.0	100.0	100.0	100.0

[1] Not available.

[2] Although these figures appear to be in error, staff members in charge of the "Census of Wholesale Trade" were unable to either find an error or explain the drastic changes in 1972. Progressive Grocer reports that wholesale grocery sales in 1974 were distributed as follows: 49 percent to voluntary wholesalers, 29 percent to cooperative wholesalers and 22 percent to unaffiliated wholesalers. Progressive Grocer, "42nd Annual Report of the Grocery Industry," April 1975.

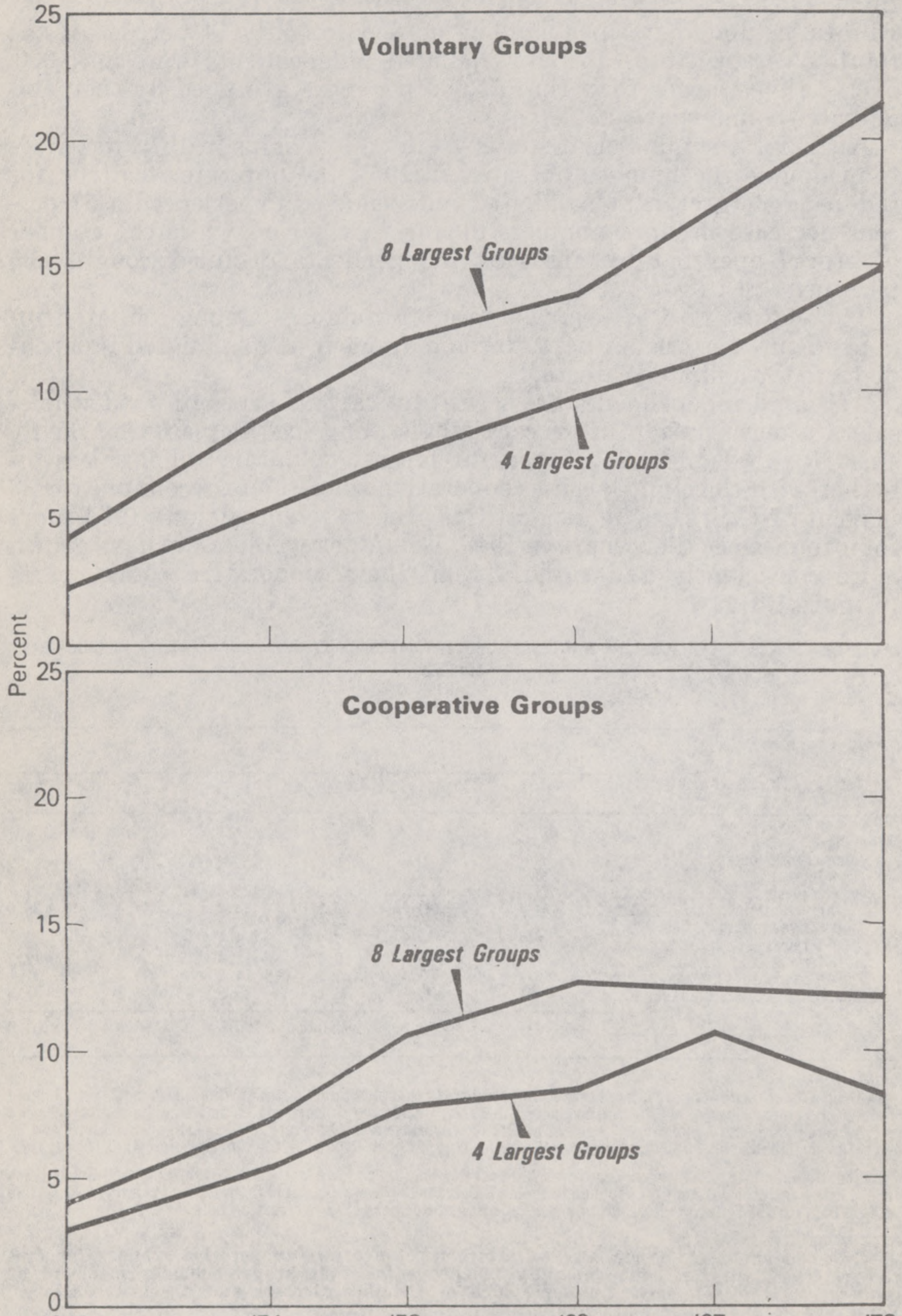
Source: Data for 1948, 1958, and 1963 are from National Commission on Food Marketing, Organization and Competition in Food Retailing, technical study no. 7, appendix table 17. Data for 1967 were estimated from issues of monthly "Wholesale Trade." Data for 1972 are from Bureau of Census, "Census of Business 1972, Wholesale Trade."

[15] Independents may be affiliated with either voluntary or cooperative groups. Cooperative retailers are retailers (generally independents) that are stockholder members of cooperative wholesale buying groups, such as Certified Grocers and Associated Grocer. Voluntary groups retailers are retailers that affiliate with voluntary merchandising groups sponsored by wholesalers and who operate under a common name, such as IGA, Red and White, Super Value and Clover Farm.

[16] Progressive Grocer, op. cit., p. 60.

[17] Ibid., p. 60.

Figure 1.6. Percentage of General-Line Wholesale Grocery Sales Made by the 4 and 8 Largest[a/] Voluntary and Cooperative Groups, Census Years, 1948-1972.



[a/] Census estimates of the percentage of general-line wholesale grocery sales made by the 8 largest voluntary and the 8 largest cooperative wholesalers were not available for 1967

Source: Table 1.2

The implications of the trend toward greater concentration in grocery wholesaling are not clear. To the extent that the growth of large wholesalers stems from or leads to the ability to supply their retail customers in ways that make them more effective competitors with grocery chains, the trend may enhance competition at the retail level. Several of the large grocery wholesalers have been active in acquiring other wholesalers. Data are not available on the rate of growth of different size wholesalers, excluding the impact of mergers.

From the standpoint of competition among wholesalers, changes in the concentration of grocery wholesaling at the state or SMSA level is more relevant than national concentration trends. While data are not available for these smaller geographic areas, it is self-evident that independent retailers in many areas have relatively few wholesalers from whom to choose. At least in part this occurs because voluntary and cooperative wholesalers tend to operate under exclusive territorial arrangements which prohibit their seeking the patronage of retailers located outside their territories.

Taken together with the increasing share of grocery sales held by the largest 20 chains, the above data suggest a continued trend toward greater concentration in grocery procurement. The National Commission on Food Marketing expressed concern about concentration in procurement in 1966 when it stated:

> **Concentration of purchasing power by food retailers is especially significant.** The increasing market orientation of the food industry and changes in the organization of buying have transferred market power from processors and manufacturers to retailers. Prospective developments in the industry are likely to further enhance their position. Increasing concentration of purchases restricts the alternatives open to suppliers, stimulates compensating concentration on their part, and weakens the effectiveness of competition as a self-regulating device throughout the industry.[18]

This trend has not abated.

Local Market Concentration

While the level and trends of concentration at the national level are useful in indicating the rate of growth of large chains and the potential degree of market power in procurement, the performance of food retailers as sellers is largely determined by the structure of local markets. Food retailing, unlike many industries, is highly localized and competition for customers is limited to a small geographic area. Thus, the level and trends of local market concentration are especially important in analyzing competitive behavior in food retailing.

The level of local market concentration in food retailing is significant for two reasons. First, the level of concentration within a market is likely to influence the competitive conduct and strategies of the firms operating in the market. Second, changes in local market concentration may serve as a proxy for changes in other market structure variables that are more difficult to measure. For example, changes in market concentration may indicate changes in the entry barriers facing new firms: increasing concentration suggests that barriers to entry

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[18] Food From Farmer to Consumer, Summary Report of the National Commission on Food Marketing, U.S. Government Printing Office, Washington, D.C., June 1966, p. 106.

are high or increasing, while decreasing concentration may indicate the reverse.

Local market concentration followed a persistent upward trend between 1954 and 1972. (This was a continuation of a trend already underway between 1948 and 1954.)[19] For a sample of 194 Standard Metropolitan Statistical Areas (SMSAs), the four largest firms in each SMSA controlled 45.1 percent of grocery store sales in 1954, on average.[20] By 1972, the unweighted average share held by the largest four firms had increased 15.5 percent to 52.1 percent (Table 1.3).[21]

The trends in concentration were similar for both SMSAs with populations in 1970 that were less than 500,000, although the rate of increase was slightly different among these groups. Four-firm concentration (CR_4) in SMSAs with 1970 populations greater than 500,000 increased nearly 10 percent (4.6 percentage points) while concentration in smaller SMSAs increased over 17 percent (8.0 percentage points) from 1954 to 1972. Concentration increased most in SMSAs

TABLE 1.3.—AVERAGE 4-FIRM CONCENTRATION FOR 194 SMSAs CLASSIFIED BY 1954 4-FIRM CONCENTRATION LEVEL, 1954–72

Market size and level of 4-firm concentration level in 1954	Number of SMSAs	4-firm concentration					Average 1972 market sales (thousands) [1]
		1954	1958	1963	1967	1972	
SMSAs over 500,000: [2]							
CR_4 less than 40	17	35.3	39.7	40.8	41.5	46.4	$803,505
40.0 to 49.9	21	45.4	49.2	49.4	47.5	49.2	568,975
50.0 to 59.9	18	53.5	55.6	54.1	54.2	53.0	725,802
60.0 and over	2	69.7	68.7	67.9	67.3	75.0	524,411
Number and average	58	45.8	49.1	49.0	48.5	50.4	684,850
SMSAs under 500,000: [2]							
CR_4 less than 40	44	34.8	41.8	42.6	45.6	46.8	113,654
40.0 to 49.9	54	45.2	49.0	51.0	52.7	54.1	107,092
50.0 to 59.9	30	54.0	57.1	57.4	56.1	57.1	107,916
60.0 and over	8	64.0	63.9	62.4	60.3	61.7	111,216
Number and average	136	44.9	49.3	50.4	51.6	52.9	109,639
Average all SMSAs		45.1	49.2	50.0	50.7	52.1	281,610

[1] Grocery store sales for establishments with payroll.
[2] Population in 1970.

Source: 1954 and 1958 Census of Business, Retail Trade, vol. I, summary statistics; 1963 Census of Business, Retail Trade, United States, BC 63–RA1; 1967, a special tabulation by the Bureau of Census for the Federal Trade Commission; 1972, a special tabulation by the Bureau of Census for the Federal Trade Commission and the U.S. Department of Agriculture. Appendix F shows data for individual SMSA's.

[19] Although the National Commission on Food Marketing was unable to obtain concentration data for 1948 because the Bureau of the Census had destroyed the basic data, available information indicates that a sizable increase in four-firm concentration occurred between 1948 and 1954. For example, the largest chains in 11 metropolitan areas increased their average share from 25.7 percent to 32.5 percent. Additionally, in seven small Midwestern cities the average four-firm concentration increased from 45.6 percent to 54.2 percent, or 8.6 percentage points over the period. Federal Trade Commission. Staff Report on the Structure and Competitive Behavior of Food Retailing. June 1966, pp. 6–7.

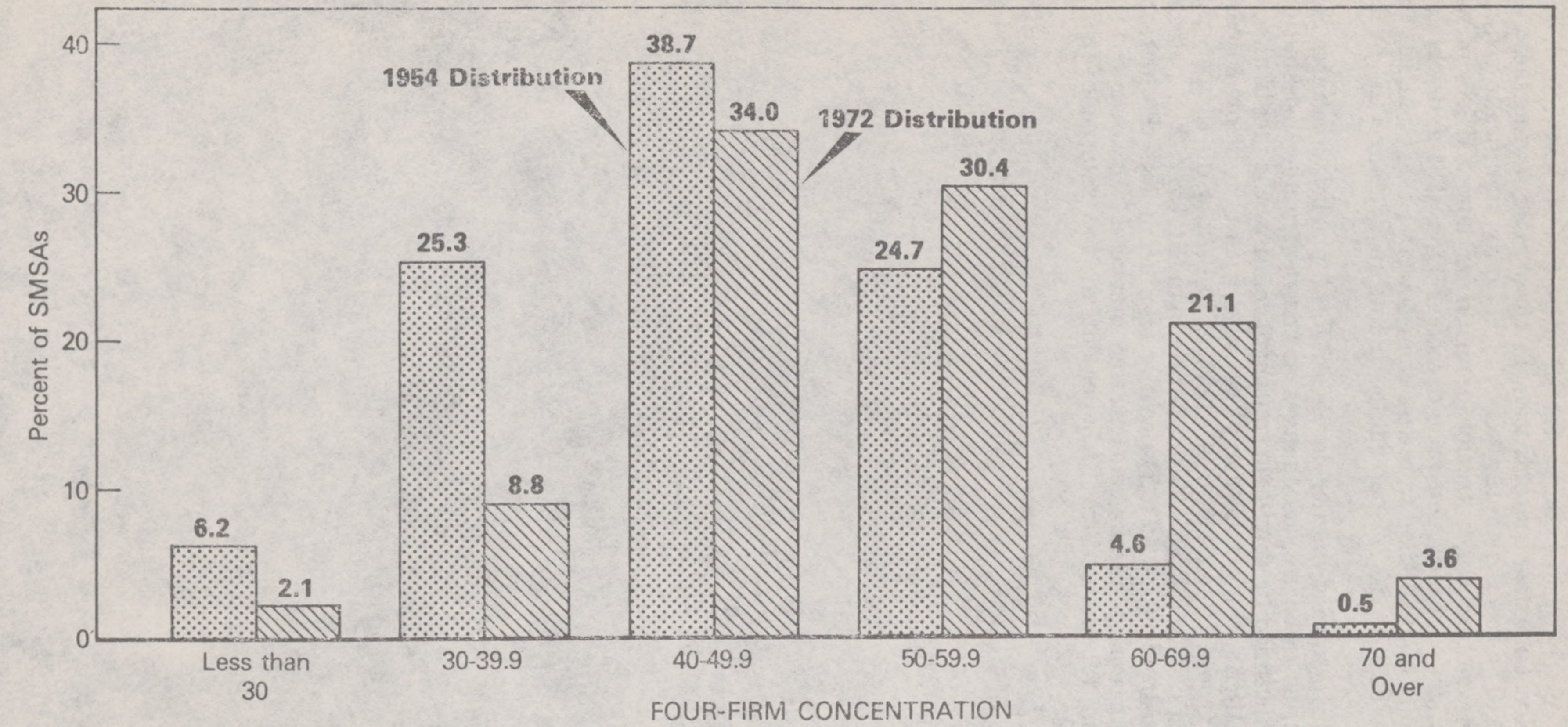
[20] These are SMSAs for which CR_4 data are available for each Census year between 1954 and 1972. The geographic definition of 109 of these was changed over the period.

[21] The data indicate that markets which did not experience a change in definition incrased more sharply in concentration than SMSAs which were redefined. Definitions changed for 109 of the 194 sample SMSAs between 1954 and 1972; for this subset of markets average concentration increased from 45.4 percent to 50.2 percent, significantly less than the average increase in concentration (44.8 to 53.9 percent) for the remaining 85 SMSAs. The relative magnitude of the definitional change also had a discernable influence on concentration. Those SMSAs (70 in total) in which the definitional change resulted in more than a 10 percent addition to grocery store sales experienced an increase in concentration from 45.4 percent to 49.0 percent. The 7.9 percent (3.6 percentage point) increase in four-firm concentration in those markets was substantially less than the 19.2 percent (8.6 percentage point) increase in concentration in SMSA whose definitions either remained the same or, if changed, resulted in less than 10 percent increase in total grocery store sales (Appendix Table A.7).

that had relatively low concentration in 1954 (CR_4 less than 50). The average local market concentration in those SMSAs increased from 40.6 to 50.0 percent over the period. The only significant reduction in average market concentration occurred in those SMSAs in which the four-firm concentration ratio exceeded 60 in 1954 and which had populations in 1970 that were less than 500,000; these SMSAs experienced a decline of 2.3 percentage points in average CR_4 over the period.

The shift toward higher levels of local market concentration is further illustrated by the changes in the percentage distribution of SMSAs classified by four-firm concentration. For the identical sample of 194 SMSAs, the percentage of markets with CR_4 below 50 percent declined from 70.2 in 1954 to 44.9 percent in 1972, while the percentage of markets with CR_4 of 50 or more expanded from 29.8 percent to 55.1 percent (Figure 1.7). Especially significant was the increase in the proportion of highly concentrated markets (CR_4 over 60); they rose from 5.1 percent to 24.7 percent of the sample of SMSAs examined.

Figure 1.7. Percentage Distribution of Four-Firm Concentration for an Identical Sample of 194 SMSA's[a/], 1954 and 1972.



[a/] The sample is limited to those SMSA's for which the Bureau of Census calculated four-firm concentration ratios in both 1954 and 1972.

Source: Bureau of Census, 1972 Census of Retail Trade, special tabulation for the Federal Trade Commission and the U.S. Department of Agriculture.

A number of countervailing forces are working to change the level of concentration in local markets. Although time did not permit an extensive analysis of this subject, the statistical findings reported in Appendix E shed new light on this subject for the period 1967–1975.[22]

Briefly, the analysis reveals that horizontal mergers had a statistically significant positive influence on changes in four-firm concentration (CR_4) between 1967 and 1975. But more importantly, the statistical analysis suggests that the market power of large grocery store chains exerts a significant positive impact on CR_4. A strong positive relationship was found between the number of large food chains [23] in an SMSA in 1967 and the change in CR_4 between 1967 and 1975. In other words, holding other things the same, CR_4 increased more in markets occupied by many food chains than in markets with few large chains.

The analysis further found a significant positive relationship between the entry of large chains into SMSAs—whether by internal growth or by merger—and changes in CR_4. That is to say, holding other things constant, when a large food chain entered a market, it stimulated an increase in CR_4. Large chain entry by merger had a greater concentrating effect than entry de novo, however. Entry via merger by corporations previously not involved in food retailing had similar concentrating effects as the entry of large chains by merger. Cross subsidization is possible in either case and may have similar effects.

Other factors hypothesized to influence changes in CR_4 were A & P's shares of the market in 1967, the level of CR_4 in 1967, market growth and market size. All the variables had the expected negative impact on change in CR_4, although market growth and market size were not statistically significant and the 1967 CR_4 was significant in only two equations. The negative relationship of A & P's 1967 share reflects A & P's general loss in market share over the period. In markets where A & P had a sufficient market share in 1967 to rank among the top four firms, their subsequent decline in market share tended to reduce the four-firm concentration ratio. The CR_4 in 1967 was also negatively related to the change in CR_4. When other things are held constant, there is a tendency for CR_4 to increase more rapidly in markets with low CR_4 than in markets with high CR_4.

Impact of Mergers on Structure of Grocery Retailing

The 26 year period, 1949–1975, witnessed a large volume of merger activity involving food retailers. There were 1,014 recorded acquisitions with combined sales of $13.0 billion (Table 1.4). During the first 15 years of this period, mergers contributed significantly to national concentration. From 1949 to 1964, the largest 20 chains in 1963 acquired retail grocery firms with sales exceeding $3 billion. This represented about 70 percent of all acquired retail grocery sales. A National Commission on Food Marketing study concluded that, in the absence of mergers by the 20 largest chains of 1963, the share of

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[22] The analysis is restricted to the period 1967–1975 because information on horizontal mergers was not available for earlier years.

[23] A large food chain is defined as one with annual grocery store sales of $500 million or more in 1972.

national sales held by these chains would have increased by less than 1 percent between 1948 and 1963.[24]

TABLE 1.4.—ACQUISITIONS OF FOOD RETAILERS, 1949–75

[Dollars in millions]

	By all acquirers		By 20 leading food chains [1]			By 10 leading food chains [1]		
Year	Number of acquisitions	Sales of acquired	Number of acquisitions	Sales of acquired	Percent of total acquired sales	Number of acquisitions	Sales of acquired	Percent of total acquired sales
1949	5	$66	1	$47	71	1	$47	71
1950	5	4	2	3	75	1	1	25
1951	12	28	6	25	89	5	19	68
1952	10	71	5	55	77	4	53	75
1953	13	88	4	77	88	2	61	69
1954	24	76	7	37	50	4	31	41
1955	55	559	23	465	83	15	267	48
1956	69	450	32	310	69	20	141	31
1957	52	319	20	194	61	14	170	53
1958	74	517	41	361	70	27	261	50
1959	63	319	34	136	43	14	24	8
1960	44	307	25	201	65	10	36	12
1961	50	518	30	407	79	16	292	56
1962	53	306	24	179	58	14	157	51
1963	51	568	27	463	82	16	416	73
1964	41	312	16	188	60	8	153	49
1965	28	558	5	61	11	3	35	6
1966	40	539	6	110	20	3	73	14
1967 [2]	33	1,350	3	21	2	0	0	0
1968	51	1,155	12	[3] 314	[4] (12)27	6	[3] 199	[4] (2)17
1969	45	715	14	41	8	6	13	3
1970	36	688	9	74	11	5	22	3
1971	27	435	2	28	6	2	28	6
1972	59	[5] 1,069	6	242	20	1	3	([6])
1973	27	[5] 206	13	[5] 29	14	3	11	5
1974	18	[5] 1,591	4	30	2	3	14	1
1975 [7]	29	255	5	99	39	3	84	35
Total	1,014	12,879	376	4,197	32	206	2,611	20

[1] For 1949–66, data are for largest chains of 1963. Subsequent data are for the largest chains of 1975.
[2] The FTC merger notification program did not require reports from food distributors until June of 1967.
[3] Includes Lucky's acquisition of Eagle stores, with estimated sales of $175,000,000. See text.
[4] Percent excluding Lucky's acquisition of Eagle stores, which was approved by the FTC. See text.
[5] Sales data not available for 1 firm in this category.
[6] Less than 1 percent.
[7] Data for 1975 are not complete since pre-merger notification data were available only for the 1st months of 1975.

Source: Data from 1949–66 are from Bureau of Economics, Federal Trade Commission as reported in Willard F. Mueller, "The Celler-Kefauver Act: Sixteen Years of Enforcement," Report to the Antitrust Subcommittee of the Committee on the Judiciary, House of Representatives, Oct. 16, 1967. Data for 1967–75 from FTC merger notification reports supplied to the Joint Economic Committee, and from secondary sources. FTC data reported 185 retail acquisitions with combined sales of $4,455,000,000. Secondary sources reported 142 retail acquisitions with combined sales of $2,954,000,000. Of this latter total, 8 acquisitions had combined sales of $1,265,000,000. These large acquisitions involved the acquisition of large food retailers by large firms not involved in food retailing. The FTC notification program did not require reporting these mergers.

Commencing in the mid-1960s, public policy toward mergers by large food chains changed the pattern, if not the tempo, of mergers in food retailing.[25] On June 10, 1965, Grand Union entered into a consent decree with the FTC, which required Grand Union to dispose of certain acquired stores and to make no further horizontal acquisitions for 10 years without the prior approval of the FTC. On December 21, 1965, the Commission entered into a consent agreement which required Consolidated Foods to divest itself of food stores with combined sales of about $200 billion.[26] On March 3, 1966, the Com-

[24] National Commission on Food Marketing, "Organization and Competition in Food Retailing," Technical Study No. 7, June 1966, p. 114.
[25] Willard F. Mueller, The Celler-Kefauver Act: Sixteen Years of Enforcement, Report to the Antitrust Subcommittee of the Committee of the Judiciary, House of Representatives, Oct. 16, 1967, pp. 21–22.
[26] Ibid.

mission, reversing a hearing examiner decision, issued a decision finding that several mergers by National Tea violated Section 7 of the Clayton Act; it then ordered that National Tea make no further food store acquisitions for a period of 10 years without the prior approval of the Commission. Finally, on January 3, 1967, the Commission issued an enforcement policy statement with respect to mergers in food retailing.[27] This statement made it clear that acquisitions by chains with annual sales exceeding $500 million would be subject to investigation and possible challenge, except when the acquired retailer was very small.[28]

These various legal actions, reinforced with the 1967 enforcement policy statement, had an important impact on mergers in the industry. It did not stop all mergers, nor was this its intent. In its policy statement the Commission recognized that very likely "market forces will continue to create an environment conducive to mergers in the industry."[29] While recognizing that personal and financial reasons might dictate further mergers, the Commission concluded:

> . . . whereas mergers by retail firms with annual sales in excess of $500 million may contribute to further concentration of buying power, in addition to any adverse effect that they may have at the retail selling level, it is unlikely that the prohibition of mergers by such companies would have an adverse effect on efficiency. Moreover, insofar as economies of scale require fairly large scale operations, the goal of promoting efficiency might be better achieved by channeling mergers away from the largest firms to those whose efficiency would be enhanced by further growth.[30]

During 1967–1975, merger activity by the top 10 chains (all with sales exceeding $500 million) was sharply lower than during the prior decade. Food retailers with sales of about $374 million were acquired by these chains during this period. This was only 5 percent of the sales of all food retailers acquired during the period. Moreover, the only sizeable acquisition by the top 10 was Lucky's acquisition of Eagle Stores in 1968, which was made with the approval of the FTC as part of a consent decree with Consolidated Foods.[31] If this acquisition is assumed to have involved annual sales of $175 million, the other 28 acquisitions made by the top 10 chains since 1967 had combined sales of only $200 million, for an average of only $6 million per acquisition. This is a marked contrast to previous years. From 1955 to 1964, these chains averaged 15 acquisitions per year with $12.4 million the average size of acquisition.

Merger activity by the 11th to 20th largest food chains (all of which had sales exceeding $500 million in 1975) also declined after 1967, although less sharply than the largest 10 chains. Total sales acquired per year by these chains dropped from about $100 million during 1955–64 to about $50 million during 1965–75.

The 1965–67 FTC actions toward mergers by large grocery chains occurred on the eve of the great movement that swept American industry during 1967–71, and continues at a relatively high plateau to the present time.[32] Total merger activity in food retailing peaked

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[27] Federal Trade Commission, Enforcement Policy with Respect to Mergers in the Food Distribution Industries, Jan. 3, 1967.

[28] In 1965 there were 10 chains wtih annual sales over $500 million.

[29] Federal Trade Commission, Enforcement Policy 1000, op. cit. p. 4.

[30] Ibid., p. 7.

[31] Mueller, op. cit., p. 21.

[32] See Federal Trade Commission, Bureau of Economics, Statistical Report on Mergers and Acquisitions, October 1975.

during the first two years of this period (1967 and 1968), dropped to a level similar to 1955–66 during the next three years, and then peaked again in 1972 and 1974 (Table 1.4). In total, merger activity during 1967–75 increased over prior periods. The effect of the FTC enforcement policy was to channel this accelerated merger activity away from the top 20 chains, not to stop it.

Table 1.5 breaks down the acquisitions by type of acquirer and by type of merger for the period 1967–75. It shows the largest share of all acquisitions (measured by sales) were so-called conglomerate in nature, that is, the acquiring firm was not engaged in food retailing. Conglomerate acquirers made 12 acquisitions with total sales of $3.0 billion, which represented 41 percent of total acquired sales.[33]

TABLE 1.5.—FOOD RETAILER AND WHOLESALER ACQUISITIONS, BY TYPE OF ACQUIRING FIRM, 1967–75

[Dollars in millions]

Nature of acquiring firm	Acquired grocery retailers by type of acquisition						Acquired food wholesalers	
	Total		Horizontal		Market extension			
	Number	Sales	Number	Sales	Number	Sales	Number	Sales
Food retailers:								
Top 10	29	$372	17	$104	12	$268	----	----
Top 20	68	876	43	[1]316	28	560	1	$45
Other retailers	162	2,477	105	[1]1,206	67	1,271	13	105
Food wholesalers	83	808	71	530	17	278	25	996
Conglomerate	12	3,108	----	----	----	----	----	----
Total	[2]325	7,269	219	2,052	112	2,109	39	1,146

[1] Sales data not available for 1 firm in this category.
[2] Number of mergers in various categories do not add to total because some mergers involved two categories.

Source: Federal Trade Commission merger notification reports submitted to Joint Economic Committee, and secondary sources. FTC data reported 211 acquisitions of grocery retailers and wholesalers with combined sales of $5,494,000,000; secondary sources reported an additional 155 acquisitions with combined sales of $3,601,000,000. Of the latter total, 8 acquisitions had combined sales of $1,256,000,000. These large acquisitions involved the merger of large food retailers and large firms not involved in food retailing. The FTC merger notification program did not require reporting these mergers.

Food retailers other than the top 20 were the second most active acquirers, making acquisitions with combined sales of $2,477 million, or 34 percent of the total. Wholesalers acquired 83 food retailers with combined sales of $808 million (11 percent), and the remaining 12 percent were by the top 20 chains.

In looking at type of mergers, 28 percent of acquired sales involved horizontal mergers, i.e., mergers between firms operating in the same market. Over half of these involved retailers other than the top 20.

Market extension mergers, i.e., mergers between food retailers operating in different local markets, were somewhat more numerous than horizontal. Again, the most active acquirers were retailers other than the top 20.

Post-1967 merger activity affected the structure of the market in several ways. Conglomerate mergers did not have an immediate impact on concentration either at the local or national level. But, as shown in the preceding section, when other things are held constant, market concentration tends to rise in metropolitan areas which con-

[33] Some of these acquirers were in other lines of distribution, in which case they are so-called product extension type conglomerates. The largest conglomerate acquisitions are shown in Appendix Table A.8.

glomerate firms or large food chains enter by acquiring established food retailers.[34]

The horizontal and market extension acquisitions of food retailers increased somewhat the level of concentration at the national level. Between 1967 and 1975, the top 20 chains of 1975 made horizontal and market extension mergers with combined sales of $876 million. Over this period, the top 20 chains of each year increased their market share from 34.4 percent of total U.S. grocery store sales to 37.0 percent. If we subtract the acquisitions from their growth, these chains' share of total grocery store sales would have risen to about 36.4 percent in 1975. Thus mergers accounted for only about one-fourth of the increase in these chains' market share over the period.

During 1967–1975, the overall impact of horizontal mergers on concentration in local markets was quite small. All retailers, including the top 20, made horizontal acquisitions with sales of $2,159 million.[35] This was equal to only 2.3 percent of national grocery store sales in 1972. Thus, horizontal mergers increased local concentration by an average of just over 2 percent. This is not to imply, of course, that average concentration among the top four firms in SMSAs was increased by this percentage since most acquisitions were by smaller firms which are less likely to be among the top four firms in an SMSA than large chains.

The impact of horizontal mergers in some SMSAs was quite substantial, however. Appendix Tables A.9 and A.10 show the market shares of the acquiring and acquired firms in the Standard Metropolitan Statistical Areas (SMSAs) in which both firms operated. Appendix Table A.9 covers only acquisitions by the 20 largest grocery chains of 1975. Appendix Table A.10 indicates the nature of acquisitions where the acquiring retailers were smaller than the top 20, and where the acquired grocery retailer had sales in excess of $10 million. Most of the 72 acquisitions shown in these tables involved small market shares; in only 22 cases did the acquired firm hold 2 percent or more of SMSA sales. In only 10 cases did the acquiring firm hold a market share of 10 percent or more and the acquired firm over 2 percent or more.

In sum, the pattern of the merger movement in grocery retailing changed drastically after 1964. Whereas total acquisitions of grocery retailers actually increased substantially (as measured by acquired sales) since the FTC actions aimed at the largest chains, the top 10 chains virtually ceased making acquisitions beginning in 1965. Although the change has been less dramatic, the tempo of mergers by the 11th through 20th largest chains has also slowed since 1964. The result very probably has been to slow the trend toward national sales concentration among the largest chains. Although the great majority of horizontal mergers in particular SMSAs were quite small, in those cases where one of the four leading chains were involved, such mergers had a statistically significant impact on increasing four-firm concentration.

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[34] For a discussion of the various ways in which conglomerate mergers may adversely affect competition, see Federal Trade Commission, Economic Report on Corporate Mergers, 1969. Chapters 4 and 6.

[35] Grocery store acquisitions of food wholesalers were classified as horizontal if the acquiring wholesaler operated grocery stores of their own in the same SMSA or had affiliated retailers operating in the same SMSA as the acquired stores.

As shown earlier, the leading chains (excluding A & P) have continued to expand rapidly their share of the national sales; whereas between 1948 and 1967 their share expanded by 10 percentage points (or 0.53 percentage points per year), between 1967 and 1975 their share grew by 6 percentage points (or .75 percentage points per year). Thus, the trend toward concentration in national sales has continued despite a rather strict merger policy in food retailing.

Conditions of Entry

Whereas market concentration measures the number and size distribution of firms actually competing within a market, the conditions of entry indicate the constraints which *potential* competitors face and which must be overcome before these firms can become established within a market. The extent to which barriers to entry exist is indicated by the cost or selling advantage that established firms hold relative to entering firms.[36]

In food retailing, the most relevant conditions of entry are at the local market level. At this level, entry is relatively unrestricted for independent entrepreneurs who operate one or two stores and are affiliated with a viable voluntary or cooperative wholesaler. The situation is substantially different, however, for new entrants interested in establishing a number of competitively viable new stores. The factors making entry on such a scale difficult include:

The real and pecuniary advertising and promotional economies of multistore firms that are well established in the market, especially when any of these firms hold large market positions.

The enterprise differentiation or consumer franchise held by firms already established in the market.

The scarcity of good sites for new stores because large established firms often control the preferred store sites.

The difficulty in obtaining preferred new sites because shopping center operators prefer to accept as tenants supermarkets that are already well known in the market and have established performance records.

The disadvantages new firms face in the cost of supplying and supervising new stores which may be a considerable distance from their existing warehouses. This generally dictates that chains establish in a relatively short time a sufficient number of stores in a community to be supplied efficiently.

The advertising advantages of large established firms are of particular significance and stem from a combination of real and pecuniary scale economies. Real scale economies in advertising accrue to established chains with a large local market share. Since advertising expenditures are spread over larger sales volumes, advertising expenses per dollar of sales are lower. Additionally, the advertising allowances of food retailers may increase more rapidly than advertising expenditures as a firm moves from a small share of market to a large share.[37]

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[36] Joe S. Bain, Barriers to New Competition, Harvard University Press, Cambridge, Mass., 1956.

[37] Advertising allowances, in order to be legal, must be proportional to the sales volume of different retailers. However, firms with large market shares may use only a portion of their advertising allowances to pay for the required ads. The remainder may then be used to support advertising of store brands, perishables, and other products. In some cases, the total advertising allowances received by retailers have been found to exceed their total advertising expenditures.

As a result, net advertising expenses as a percent of sales are often significantly lower for firms with large market shares.

Pecuniary scale economies accrue from the inverse relationship that exists between the total volume of company advertising and the advertising rates charged by the media. Large established firms in a market often realize volume discounts from newspapers which cannot be achieved by a new entrant or small scale competitors.[38]

Taken in total, the factors cited above likely pose significant barriers to the entry of grocery chains into most local markets. They are probably more difficult for small chains to overcome than for large chains such as those included in this study.[39]

Trends in Gross Margins, Expenses, and Profits

Gross margin—the difference between what retailers pay for merchandise and what they sell it for—represents the cost to consumers of the retailing function. When the operating expenses of retailers are deducted from their gross margins, the result is net operating profit. All three—gross margins, operating expenses and net operating profits—are key indicators of food retailer performance. Typically, all three are measured as a percent of sales. However, net profits are also calculated as a percent of owner's equity and total assets.

Two sources provide annual statistics on the operating results of food retailers. The SMI Figure Exchange, published by Super Market Institute, provides the typical operating ratios for a large sample of chain and independent supermarkets; the Cornell University series, Operating Results of Food Chains, provides weighted mean values of the operating results of a sample of food chains. Since the SMI data are likely more representative of the entire spectrum of the retail grocery industry, this source will be relied upon more heavily in the following discussion than the Cornell data, which are more representative of large grocery chain operations.

During the decade prior to the mid 1960s, retail gross margins increased steadily as a percent of sales. The National Commission on Food Marketing noted that gross margins in food retailing increased about 14 percent over the period, 1954–1963.[40] In the last 10 years, however, gross margins have stabilized and even declined slightly. In 1974, the SMI median gross margin was 17.7 percent, about 0.4 percentage points lower than the 1965 estimate (Figure 1.8).[41]

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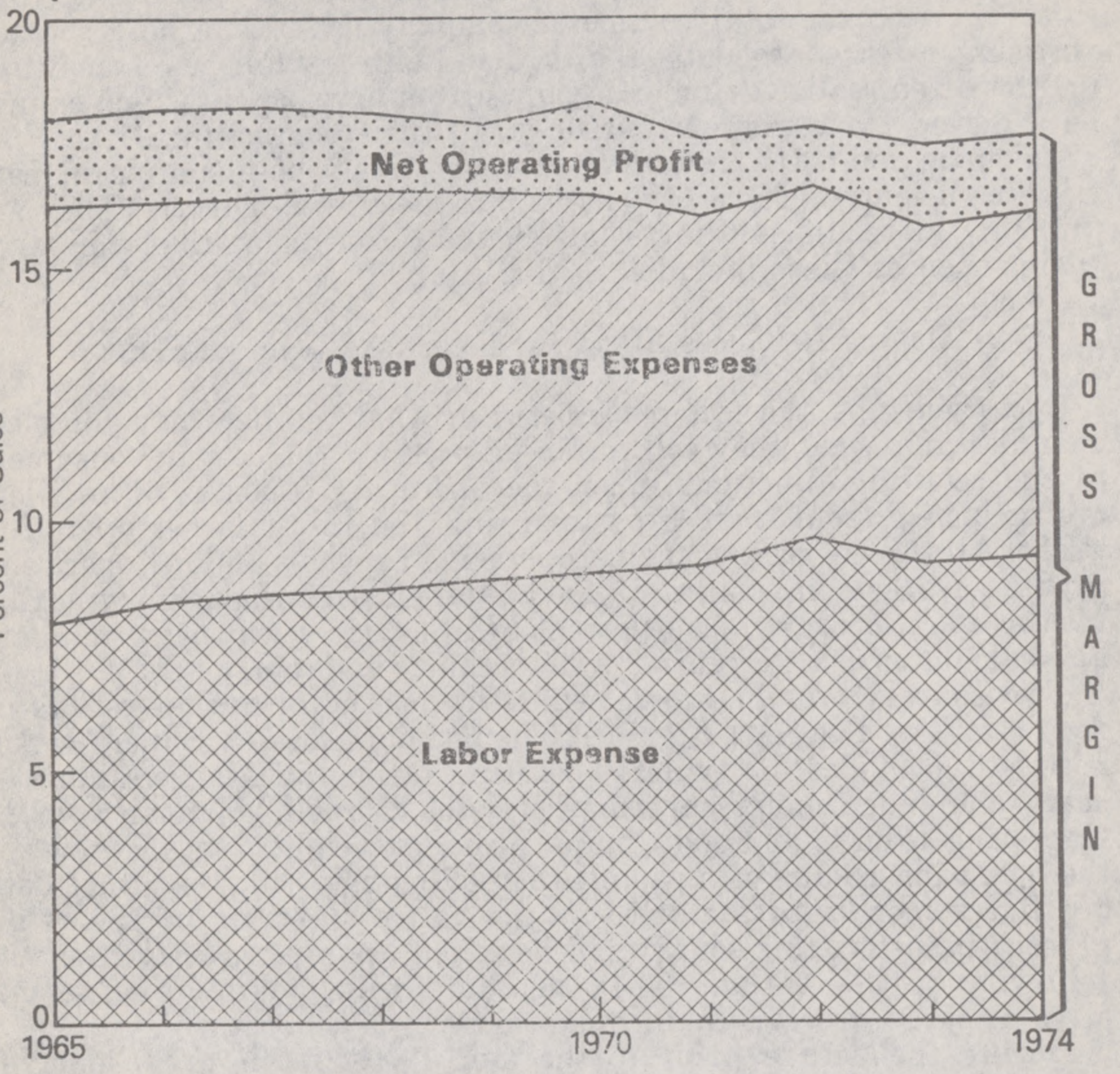
[38] For example, the newspaper advertising rates in a medium-size midwestern SMSA result in a firm which runs one full page ad per week paying 10 percent more per page than a firm that runs four pages per week.

[39] As used in this context, "entry" refers to expansion into a market through internal firm growth so that industry capacity is increased. By this definition, "entry" into a market requires building new stores. A sample of 180 SMSAs was examined to determine the extent to which the 17 chains moved in and out of markets by various means between 1966 and 1974. It was not possible to determine whether expansion into new markets was by acquisition of existing stores or by internal growth ("market entry"). During this 8-year period, 104 (58 percent) of the SMSAs were moved into by one or more of the 17 chains. In 16 SMSAs, there were offsetting departures by one of these chains. Chains most often moved into SMSAs which had relatively low CR_4s in 1967. Whereas 57 percent of the 86 SMSAs with CR_4 of less than 50 percent were moved into by one of these chains, this was true for only 41.5 percent of the 94 SMSAs with CR_4s of 50 or greater. Size of SMSA seemed to have no bearing on the markets into which these chains chose to move.

[40] Organization and Competition in Food Retailing, op. cit., pp. 217–219.

[41] SMI reports "store door gross margin"; that is, the cost of merchandise includes a charge for warehouse and delivery. The Cornell studies report firm gross margins from which warehouse and delivery expenses have not been deducted. The Cornell data indicate similar trends in gross margins during the last 10 years but are 3 to 4 percentage points higher than the SMI figures due to computational differences.

Figure 1.8. Trends in Retail Grocery Gross Margins, Selected Operating Expenses and Net Operating Profits, 1965-1974.



Source: Super Market Institute, *Figure Exchange* 1965-1974

Operating expenses have also been highly stable during the last 10 years, ranging from 16.0 percent to 16.5 percent of sales. Since labor expense, the most important expense category, increased by more than one percentage point over this period, other operating expenses as a percent of sales declined (Appendix Table A.2).

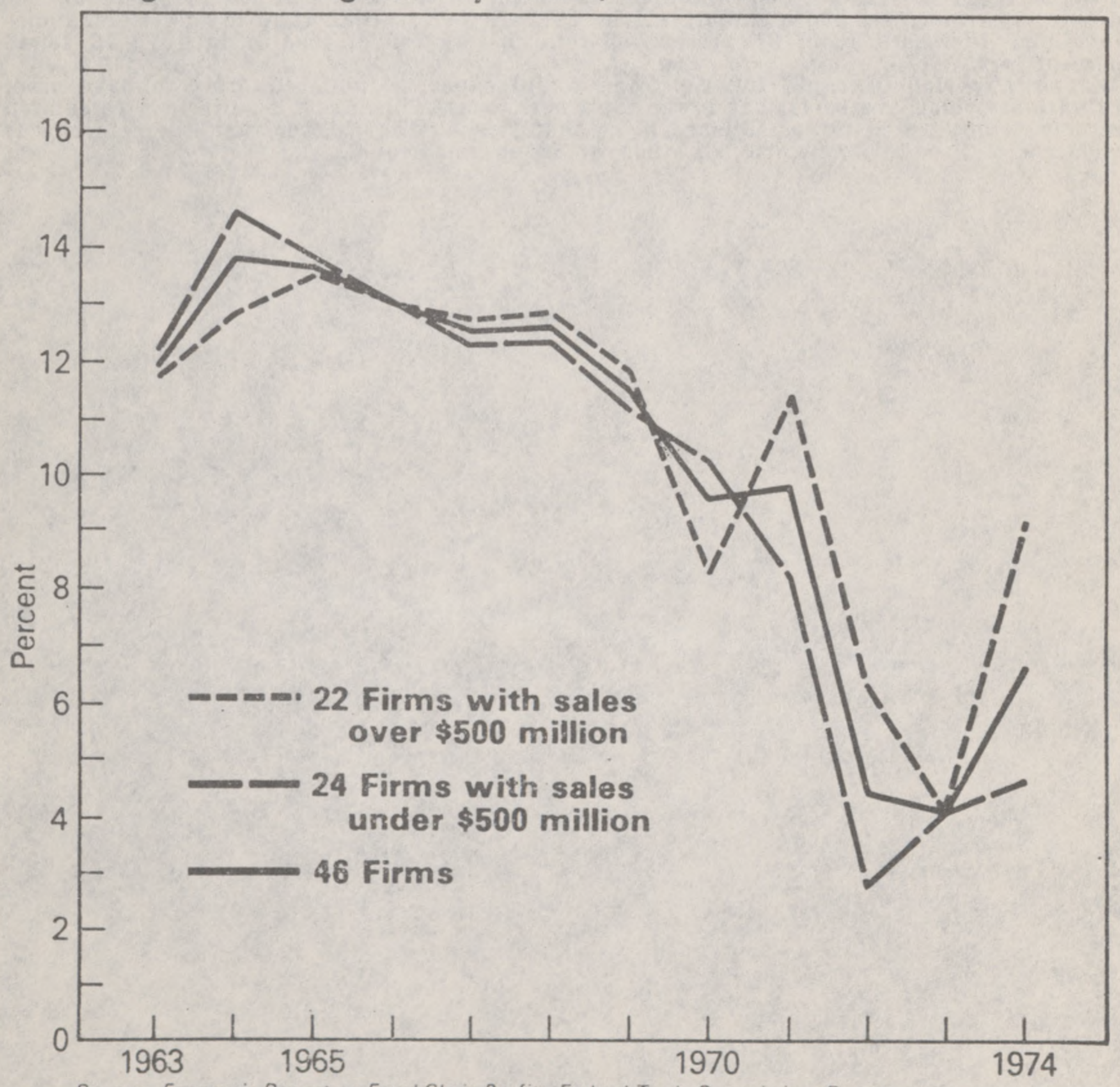
The combination of relatively stable gross margins and expenses during the last 10 years has led to relatively stable net operating profits. The SMI Figure Exchange indicates that net operating profits declined slightly, from 1.8 percent to 1.5 percent of sales over the period. A low of 1.2 percent was realized in 1972, the year that both price controls and the A & P WEO program were in full force (Figure 1.8).

The profitability of grocery chains has shown much greater variability over the last decade than that reflected in the SMI data. The Cornell studies indicate that pre-tax profits declined from 2.4 percent of sales in 1965–66 to 0.9 percent in 1972–73 (Appendix Table A.3).

Although chain profits recovered somewhat to 1.3 percent of sales in 1974, returns were still slightly below the levels of the 1960s.

The trend in average after-tax return on stockholder equity for 46 of the largest grocery chains reveals much the same pattern as return on sales (Figure 1.9). Between 1964 and 1969, returns declined gradually from 13.8 percent to 11.6 percent of stockholder equity, and then dropped precipitously to 4.1 percent in 1973. Profits rebounded sharply in 1974 and continued at about the same level during 1975. Although the general profit pattern was similar for both large and medium-sized chains, the medium-sized chains experienced a somewhat earlier and more severe decline in return on stockholder equity, and also recovered more slowly than their larger counterparts (see Appendix Tables A.4 and A.5).

Figure 1.9. Rate of Return on Stockholder Equity After-Tax, Simple Average for Leading Grocery Chains, 1963-1974.



Source: *Economic Report on Food Chain Profits*, Federal Trade Commission Report No R-6-15-23 July 1975 as amended in Appendix Table A 4

By nearly all indicators, the recent past has been an unusual period for retail grocery firms. With rapidly rising farm and wholesale food prices, price and wage controls, and desperate actions by one of the in-

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dustry giants, A & P, the early 1970s presented a combination of shocks that resulted in short-run disequilibrium in the industry.[42] For some of the least profitable companies, the stresses of this period placed them on the brink of or into bankruptcy. Some of the more profitable companies, however, particularly in the west and south, weathered this period with relatively little adverse effect on their profits. Thus, it appears that one of the net effects of the events of the early 1970s was to strengthen the relative position of healthy companies and weaken the competitive viability of marginal food retailers.

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[42] Rapid inflation creates problems in interpreting the operating results of an industry. For example, from 1967 to 1974, the following occurred:

Retail prices of food consumed at home increased 62.4 percent.
Retail grocery store sales increased 68.3 percent.
Grocery store dollars of gross margin increased 60.9 percent.
Grocery store dollars of labor expense increased 85.9 percent.
Grocery store dollars of net operating profit increased 40.2 percent.

Changes in operating ratios expressed as a percent of sales must be viewed with the above in mind. Even though the percent gross margin and percent net profit declined during this period, the dollars of gross margin and net profit realized increased substantially.

With rapid increases in both the prices retailers paid and charged for merchandise, dollar sales increased more rapidly in the 1972–74 period than total assets. Merchandise inventory increased from 37 percent of total assets for all chains in 1972–73 to 43 percent in 1974–75.

After a period of rapid inflation, one would expect established firms to have asset valuations which are somewhat lower than new firms. This likely results in a calculated return on net worth for established firms that is somewhat higher than the return that would be realized by a new firm, all other factors assumed equal.

Chapter 2. PROFIT PERFORMANCE OF LARGE FOOD RETAILERS

The performance of an industry has many dimensions, including its pricing and profit behavior, operating efficiency, progressiveness, and responsiveness to the preferences and needs of customers.[1] This report analyzes only the profit and pricing dimensions of performance. These are particularly important because both bear on the critical issue of the price consumers pay business firms for performing the food retailing function.

In attempting to identify the factors which influence the price levels and profitability of food chains, this study draws heavily on the framework of industrial organization theory. This theory holds that the structure of a market has an important influence on the business conduct of firms in that market and in turn on market performance.[2] Market structure elements that are considered of particular importance are the number and size distribution of firms in the market (as measured by market concentration and relative firm size), the conditions of entry (the ease or difficulty with which new firms can enter the market), and the degree of product differentiation (the extent to which customers prefer the products of some seller over those of others).

Past empirical studies in various industries have provided compelling evidence concerning the effect of these three elements of market structure on the average profits of firms in a market.[3] This evidence supports the proposition that as concentration, entry barriers and product differentiation in an industry increase—particularly beyond a certain threshold level—industry profits also increase.

Industrial organization theory is concerned primarily with the behavior of industries, i.e., the combined behavior of groups of firms. Since there is always variance in the behavior among the firms composing an industry, the theory loses explanatory power in examining the performance of individual firms. Since the data in this study are for individual firms rather than for groups of firms in various markets, the study undertakes the more difficult task of explaining the prices and profits of individual firms.[4]

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[1] Economists use the term performance to mean "the strategic end results of the market conduct of sellers and buyers . . . this is the crucial indicator of how well the market activity of firms has contributed to the enhancement of general material welfare." Joe S. Bain. Industrial Organization. 1968. p. 372.

[2] Joe S. Bain. Industrial Organization, 1968; F. M. Scherer, Industrial Market Structure and Economic Performance. 1971.

[3] See for example Leonard Weiss, "Quantitative Studies of Industrial Organization," in Frontiers of Quantitative Economics, ed. M.D. Intriligator, North Holland Publ. Co., 1970.

[4] This point has been illustrated by comparing the results when using grouped and ungrouped firm data used in a study by George Stigler. "A Theory of Oligopoly," Journal of Political Economy, February 1967, pp. 44–61. Stigler correlated average profit rates of the leading firms in 17 industries with the level of four-firm concentration of these industries. This explained 28 percent of the variance in industry profit rates. However, when each of the firms used to compute his average profit rates is treated as a separate observation, only 4 percent of the explained variance in profits was explained by differences in market concentration. Reported in Federal Trade Commission. The Influence of Market Structure on the Profit Performance of Food Manufacturing Companies, 1969, pp. 5–6.

In any analysis of industry behavior, defining the "relevant" market within which competition occurs is essential. This can be determined by examining the geographic scope of buying behavior. For example, if consumers regularly purchase a product from firms throughout the country, the selling firms compete in a national market. This is not the case in food retailing. Consumers generally purchase their groceries within a few miles of their home. Competition in the food retailing-consumer market is essentially local in nature, often involving quite small communities. In this study, Census defined Standard Metropolitan Statistical Areas (SMSAs) are used as the relevant markets for analysis. In many cases, the SMSA is an excessively broad definition of the geographic market within which competition occurs in the retail sale of grocery products. SMSAs often are made up of two or more counties and several population centers. Where an SMSA embraces a number of distinct population centers, concentration ratios computed on an SMSA basis generally understate the concentration level occurring in individual population centers. However, SMSAs are the smallest geographic areas for which concentration data are available and are therefore used as "markets" in this study.

Since data were not available on the barriers to entry into various SMSAs, this analysis examines only two market structure variables: the four-firm concentration ratio (the sum of the market shares of the largest four firms) and the market share of individual companies. The latter variable, at least to some extent, also measures the degree of differentiation enjoyed by individual firms, and therefore also serves as a proxy for one source of entry barriers. One aspect of the study also examines the impact of entry barriers on the profits of individual firms entering a market.

In relating firm prices and profits to firm market share and the four-firm concentration ratio, alternative interpretations should be recognized. A positive and significant relationship between firm profits in a market and its market share may be due to higher prices, lower costs, or both. Costs in food retailing are particularly susceptible to variations in the utilization of store facilities. For example, a National Commission on Food Marketing study found that a 20 percent increase in sales per square foot of selling space reduced store operating costs per dollar of sales by 1 percentage point (about a 6 percent reduction).[5] The same study found that firms with high market shares generally realized higher sales per square foot and hence lower store costs.[6] High market share firms also had somewhat higher gross margins and net margins.

In addition to its influence on store operating costs, a high market share may also bring economies in advertising, physical distribution and other headquarters operations. Thus, costs per dollar of sales would be expected to decline as firm market share increases. Unless prices are dropped to reflect lower costs, a positive relationship between profits and market share would follow.

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[5] National Commission on Food Marketing, Organization and Competition in Food Retailing, op. cit., p. 149.

[6] Ibid., pp. 181–83. These findings must be interpreted cautiously, however. High sales per square foot are easier to achieve when a firm has a strong market position and is able to expand sales faster than store capacity. Thus, increased market power may result in higher store utilization with its associated cost advantages.

Industrial organization theory also suggests a positive relationship between profits and firm market power (for which market share is one measure). However, in this case the cause of higher profits is hypothesized to be monopolistic selling or monopsonistic purchasing practices, not lower real costs. Monopolistic sellers can charge higher prices and monopsonistic buyers may induce discriminatory low prices from input suppliers.[7]

Another study for the Food Commission, which analyzed a large chain operating in several markets, found a strong positive relationship between market share and the pretax profits in different markets.[8] A weaker positive relationship was found between market share and percent gross margins. Market share and operating costs per dollar of sales had a moderately negative relationship; market share and net advertising costs per dollar of sales were also negatively correlated. These findings lend support to the above discussion of expected relationships between market structure and profit performance of food store chains. However, they deal only indirectly with the influence of market position on price levels. Gross margins are directly influenced by price levels, but are not a perfect proxy for prices since they are also influenced by procurement costs (which might be lower in high market share markets due to real economies in large volume procurement and/or greater bargaining power), the type of specials offered (a dominant firm may be able to maintain its market position without offering deep-cut specials) and the amount of marketing loss (shrink, mark-down, and throw-outs). Thus, although the above study found a modest positive relationship between market share and percent gross margin, one cannot conclude that this was necessarily due to difference in prices.

The present study will examine the relationship between the structure of markets and both price levels and profits. The results should provide useful insights into this important and controversial subject.

Food Chains Included in Study

In 1974, the 17 retail grocery chains included in this study all ranked among the 20 largest U.S. grocery firms (Table 2.1). All 17 chains had 1974 company sales in excess of $700 million and 15 of the firms had sales greater than $1 billion. The average company sales of these chains was $2.6 billion. They operated over 12,700 grocery stores during 1974, which represented about 6 percent of the total number of grocery stores in the U.S. and about 52 percent of the total number of chain stores (excluding convenience stores) in operation during the year.[9] Their combined sales were $43.8 billion, which represented 69 percent of all chain food stores sales and 37 percent of total food store sales.[10]

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[7] There is evidence that on occasion the largest chains in a market have been able to buy fluid milk and bread products at lower prices than other retailers. See FTC Staff, Economic Report on Food Retailing, January 1966, pp. 181–202. Recently a Federal Trade Commission administrative law judge found A & P guilty of knowingly inducing discriminatory prices in the purchase of milk and other dairy products sold in the stores of its Chicago division. FTC News, FTC Initial Decison, D. 8866, October 1975.

[8] National Commission on Food Marketing, Organization and Competition in Food Retailing, op. cit., pp. 358–69.

[9] "42d Annual Report of the Grocery Industry," Progressive Grocer, April 1975, p. 59; store numbers for the 17 chains are from company annual reports.

[10] Chain and total food store sales are from the Bureau of Census Current Reports, 1974 Annual Retail Trade Report (Government Printing Office, Washington, D.C., December 1975), p. 3. These percent figures are slightly overstated because 5 to 10 percent of total company sales are not food sales.

TABLE 2.1.—COMPANY SALES AND NET INCOME FOR 17 LARGE RETAIL FOOD CHAINS, 1974

[Dollars in thousands]

Firm	Total [1] sales	Net [2] income	Net income as a percentage of sales	Net income [2] as a percentage of stockholder equity
Safeway	$8,185,190	$79,205	1.0	11.4
A & P	6,874,611	(157,071)	−2.3	[3] −35.4
Kroger	4,782,449	45,239	.9	10.8
Winn-Dixie	2,962,165	55,552	1.9	19.1
Acme	2,734,710	19,321	.7	9.0
Lucky	2,701,771	41,446	1.5	20.5
Jewel	2,598,913	30,230	1.2	10.6
Food Fair	2,380,561	8,926	.4	6.4
Grand Union	1,562,736	9,504	.6	6.2
Supermarket General	1,498,475	2,673	.2	3.7
National Tea	1,403,815	(2,635)	−.2	−3.5
Stop & Shop	1,223,791	11,992	1.0	14.7
Fisher Foods	1,124,404	12,581	1.1	18.9
Albertson's	1,046,105	11,702	1.1	19.3
Allied	1,044,404	(3,426)	−.3	−8.5
First National	934,803	5,708	.6	8.9
Giant	741,043	6,979	.9	10.6
Total	43,843,746	177,926	----------	----------
Average	2,579,044	10,466	.6	6.3

[1] Includes sales from all company operations.
[2] After-tax provisions.
[3] In fiscal year 1974 (ended Feb. 2, 1975) A & P provided $200,000,000 for the cost of closing store facilities. The $200,000,000 write-off offset the company's $33,400,000 operating profit for the year and resulted in a net after-tax loss of $157,000,000.

Source: Company annual reports.

Although many of these 17 chains have diversified into other business activities, their food retailing operations provided over 90 percent of their total revenue in 1974. Thus, the profitability of those firms was largely dependent upon their food retailing operations. The average after-tax profits of the 17 chains in 1974 was 0.6 percent return on sales and 6.3 percent return on stockholder equity. The return on stockholder equity varied greatly, ranging from −35.4 percent for A & P to 20.5 percent for Lucky.

Market Expansion (1966–74)

For 199 SMSAs examined, the 17 chains have significantly increased the total number of SMSAs in which they operate since 1966. This increase was the result of internal growth and, in some cases, market extension mergers.[11] If the number of SMSAs in which each chain operated is totalled across all 17 chains, the sum was 558 in 1966 and 652 in 1974, an increase of 17 percent. The average metropolitan area had 2.8 of these chains in 1966 and 3.3 in 1974.

The number of SMSAs in which each chain operated during 1966 and 1974 as well as the frequency with which the individual chains encountered one another are summarized in Table 2.2. Considerable variation can be noted in the average number of the 17 chains which

[11] Lucky's acquisition of Consolidated Foods' Eagle Division, the consolidation of two Wakefern Co-op members to form Supermarkets General Corp. and Fisher Inc.'s acquisition of Dominick's (Chicago area), Shopping Bag (Los Angeles area) and Kantor Markets (Cincinnati area) were the major food retailing acquisitions by the 17 chains between 1966 and 1974. For an analysis of the impact of large chain entry, whether de novo or by merger, on market concentration, see Appendix E.

each firm encountered in the SMSAs in which they operated. Safeway, for example, operated in 62 SMSAs in 1974 and encountered the other chains 116 times. That is, in each of its markets, Safeway competed with an average of 1.9 other chains listed in Table 2.2. By contrast, Giant operated in only two of these SMSAs in 1974 but encountered the other chains 10 times—an average of 5 chains per market.[12]

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[12] These data provide some insights into the degree of interdependence that may exist between the large chains and across markets. For example, Albertson's encounters Safeway in 27 of the 29 SMSAs in whch it operates. Conversely, Safeway encounters Albertson's in 27 of the 62 SMASs in which it operates, and interfaces more frequently with Albertson's than with any of the other 16 chains. Conglomerate theory suggests that firms which encounter each other frequently in different markets have strong incentives to practice mutual forbearance. When it occurs, mutual forebearance dampens competition and leads to both higher prices and profits. Time and data limtations prevented an analysis of the level of interdependence across markets and its effect on price and profit levels.

TABLE 2.2.—COMPETITIVE INTERFACE BETWEEN 17 LARGE GROCERY CHAINS, 1966 AND 1974 [1]

	A & P	Acme	Albert-son's	Allied	First Na-tional	Fisher	Food Fair	Giant	Grand Union	Jewel	Kroger	Lucky	Na-tional Tea	Safe-way	Super-market Gen-eral	Stop & Shop	Winn-Dixie	Com-petitive inter-face (1966 and 1974)	Percent change (1966–74)	SMSAs 1966	SMSAs 1974	Net change (1966–74)	Percent change (1966–74)
A & P		30	2	48	20	9	38	2	24	17	60	9	24	16	16	21	37	373	+11.3	147	142	−5	−3.4
		(35)	(2)	(16)	(24)	(5)	(37)	(2)	(22)	(11)	(69)	(7)	(28)	(18)	(8)	(19)	(34)	(335)					
Acme	30		10	5	4	6	19	2	13	0	6	13	7	17	8	5	0	145	+34.3	36	44	+8	+22.2
	(35)		(1)	(2)	(6)	(0)	(18)	(2)	(11)	(0)	(6)	(2)	(8)	(9)	(8)	(0)	(0)	(108)					
Albertson's	2	10		3	0	3	1	0	0	1	4	12	1	27	0	0	0	64	+220.0	11	29	+18	+163.6
	(2)	(1)		(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(4)	(0)	(11)	(0)	(0)	(0)	(20)					
Allied	48	5	3		0	7	5	0	3	3	39	4	9	10	0	0	17	153	+225.5	24	56	+32	+133.3
	(16)	(2)	(0)		(0)	(0)	(0)	(0)	(0)	(2)	(16)	(0)	(2)	(7)	(0)	(0)	(2)	(47)					
First National	20	4	0	0		0	7	0	12	7	0	0	0	0	9	20	0	79	−3.7	24	21	−3	−12.5
	(24)	(6)	(0)	(0)		(0)	(12)	(0)	(14)	(4)	(0)	(0)	(0)	(0)	(5)	(17)	(0)	(82)					
Fisher	9	6	3	7	0		0	0	0	1	11	4	0	5	0	0	0	46	+475.0	3	14	+11	+266.7
	(3)	(0)	(0)	(0)	(0)		(0)	(0)	(0)	(0)	(3)	(0)	(2)	(0)	(0)	(0)	(0)	(8)					
Food Fair	38	19	1	5	7	0		2	17	0	0	1	2	7	13	9	14	136	+20.4	37	40	+3	+8.1
	(37)	(18)	(0)	(0)	(12)	(0)		(2)	(12)	(1)	(1)	(0)	(1)	(6)	(8)	(7)	(8)	(113)					
Giant	2	2	0	0	0	0	2		1	0	0	1	0	2	0	0	0	10	0	2	2	0	0
	(2)	(2)	(0)	(0)	(0)	(0)	(2)		(1)	(0)	(1)	(0)	(0)	(2)	(0)	(0)	(0)	(10)					
Grand Union	24	13	0	3	12	0	17	1		1	0	1	5	1	8	13	0	99	+25.3	22	26	+4	+18.2
	(22)	(11)	(0)	(0)	(14)	(0)	(12)	(1)		(1)	(1)	(0)	(5)	(1)	(4)	(7)	(0)	(79)					
Jewel	17	0	1	3	7	1	0	0	1		6	4	7	2	0	8	0	57	+50.0	13	20	+7	+53.8
	(11)	(0)	(1)	(2)	(4)	(0)	(0)	(0)	(1)		(7)	(1)	(3)	(2)	(0)	(5)	(0)	(38)					
Kroger	60	6	4	39	0	11	0	0	0	6		4	9	10	0	0	17	166	+9.9	71	65	−6	−0.5
	(69)	(6)	(1)	(16)	(0)	(3)	(1)	(1)	(1)	(7)		(3)	(21)	(6)	(0)	(0)	(16)	(151)					
Lucky	9	13	11	4	0	4	1	1	1	4	4		7	17	0	0	0	77	+133.3	16	25	+9	+56.3
	(7)	(2)	(4)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(3)		(4)	(12)	(0)	(0)	(0)	(33)					
National Tea [2]	24	7	1	9	0	0	2	0	5	7	9	7		1	0	0	2	77	−1.3	33	28	−5	−15.2
	(28)	(8)	(0)	(2)	(0)	(2)	(2)	(0)	(5)	(3)	(21)	(4)		(2)	(0)	(0)	(2)	(78)					
Safeway	16	17	27	10	0	5	7	2	1	2	10	17	1		0	1	0	116	+50.6	57	62	+5	+8.5
	(18)	(9)	(11)	(7)	(0)	(0)	(6)	(2)	(1)	(2)	(6)	(12)	(2)		(0)	(1)	(0)	(77)					
Supermarket General [3]	16	8	0	0	9	0	13	0	8	0	0	0	0	0		10	0	64	+93.9	8	16	+8	+100.0
	(8)	(8)	(0)	(0)	(5)	(0)	(8)	(0)	(4)	(0)	(0)	(0)	(0)	(0)		(0)	(0)	(33)					
Stop & Shop	21	5	0	0	20	0	9	0	13	8	0	0	0	1	10		0	87	+55.4	19	23	+4	+21.1
	(19)	(0)	(0)	(0)	(17)	(0)	(7)	(0)	(7)	(5)	(0)	(0)	(0)	(1)	(0)		(0)	(56)					
Winn-Dixie	37	0	0	17	0	0	14	0	0	0	17	0	2	0	0	0		87	+40.3	34	38	+4	+11.8
	(34)	(0)	(0)	(2)	(0)	(0)	(8)	(0)	(0)	(0)	(16)	(0)	(2)	(0)	(0)	(0)		(62)					

[1] Based on 199 SMSAs.
[2] National Tea includes Loblaw stores in 1966 and 1974.
[3] Supermarkets General operated under Shoprite logo prior to 1969.

Note: 1966 markets in parentheses.

Source: Metro Market Studies 1967 and 1975. Supermarket News 1968–69 and 1975.

Profit Performance, 1970–74

The Joint Economic Committee requested quarterly sales and net profit data from the 17 large chains for the four years, 1970–73, and for the first three quarters of 1974. Data were requested for each retail operating division and for each SMSA over 500,000 in population. Company responses provided comparable data for 114 divisions of 14 companies. Six companies also furnished sales and net profit data for their operations in 50 large SMSAs. The division and SMSA data series were analyzed separately.

The sales and profit data examined are for grocery store operations only. Nonfood store operations, such as drug stores or general merchandise stores, and manufacturing operations were excluded.

Table 2.3 summarizes the annual profit-to-sales ratios for the supermarket divisions of the 14 chains for each of the five years examined. The average pretax profit rate for all firms was highest in 1970 at 1.85 percent of sales, reached its nadir in 1972 at 1.01 percent, and rebounded to 1.62 percent in 1974. Firms G and N consistently achieved the highest return on sales. Six of the chains (firms A, F, H, J, L, and O) experienced losses in at least two out of the five years.

TABLE 2.3.—PRETAX PROFITS OF GROCERY STORE OPERATIONS AS A PERCENT OF SALES FOR 14 LEADING GROCERY CHAINS, 1970–74

Firm	Year				
	1970	1971	1972	1973	1974
A	[1] 1.30	0.56	−2.11	−0.49	[2] 0.81
B	[1] 2.56	2.31	2.51	2.06	[3] 2.77
C	−1.08	−.31	−.10	−.03	[2] −.83
D	3.28	2.38	1.28	1.22	[2] 1.26
E	1.84	2.84	1.98	1.19	[2] 2.50
F	[1] 1.50	1.11	−.06	−.34	[3] .80
G	3.25	3.16	2.97	2.61	[2] 2.64
H	1.17	.85	−.43	−2.6	[2] .63
I	2.74	2.49	2.03	1.92	[3] 2.19
J	.66	.63	[4] −.98	−1.65	[2] .26
K	2.77	2.74	2.55	2.13	[2] 2.76
L	−.34	−.12	.13	1.08	[3] 1.57
M	2.04	1.73	.59	1.35	[3] 1.85
N	4.17	4.00	3.67	3.74	[2] 4.00
Simple average	1.85	1.74	1.01	1.04	1.62

[1] Based on last 3 quarters of calendar 1970.
[2] Based on first 3 quarters of calendar 1974.
[3] Based on first 2 quarters of calendar 1974.
[4] Data for only 3 quarters.

Note.—Pre-tax rates of return shown above represent only the profits in the domestic supermarket divisions of the 14 companies. The data are adjusted to approximate a calendar year. Extraordinary gains or losses have not been included in calculating the rates of return.

Source: Company data provided to the Joint Economic Committee, three additional firms (O, P, and Q) are not included because the profit data furnished were not comparable to that of the other firms or were not furnished for all 5 years.

Table 2.3 reveals considerable variation in chain profits during the 1970–74 period. Factors contributing to this variation were the switch from FIFO to LIFO, food price inflation, wage-price controls, and A & P's price cutting campaign, "Where Economy Originates" (WEO).

During periods of inflation, the switch from first-in-first-out (FIFO) to last-in-first-out (LIFO) inventory accounting procedures results in lowering the amount of reported profits for the year in

which the change is made. During 1974, four of the firms studied made the switch so the reported profit figures for 1974 are understated relative to preceding years.[13]

Wage-price controls appear to have had a definite impact on the profitability of large food chains.[14] Since price controls and WEO occurred during the same period, chains that competed with A & P were exposed to both shocks simultaneously. In 1972 and 1973, most firms had lower profit rates than during 1970 and 1971 (Table 2.3). Even the West Coast firms, which were less exposed to WEO, had profit rates that were below their previous levels. However, the post-mandatory price control profit rates for many chains in 1974 rebounded nearly to the 1970 level.

For firms east of the Rockies, A & P's WEO program may have contributed to chain profit variability during the 1970–74 period. A & P began converting its stores to food discounting operations in late 1971. The conversion involved discontinuing trading stamps, promotional games and other nonprice competition strategies at the same time that prices were sharply reduced. A & P's gross margins allegedly contracted from the traditional level of 20 percent to 13 percent.[15] At the time, A & P was debt free and had substantial cash reserves. The immediate impact was a 9 percent expansion in first quarter 1972 sales and a $30 million loss.

WEO, however, elicited retaliation from competitors, who lowered prices, extended store hours, and employed a variety of nonprice competitive tactics.[16] A & P's attempt to expand sales failed. Consumers increased their patronage with A & P during the low price phase of WEO, but as A & P raised prices to regain profitability, many consumers switched back to competing retailers who had larger and more attractive stores and better product selection.

Wage-price controls, changes in accounting procedures and WEO were the extraordinary factors that influenced profits during this period. Although such factors are important in the short run, preoccupation with such more or less random events may mask more fundamental market forces in local markets that determine the long-run profit margins of chains. In general, a firm's rate of profit is determined by the interaction of management decisions with the competitive market environment in which the firm operates.

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[13] Acme, Giant, Safeway, and Winn-Dixie changed from FIFO to LIFO in 1974. See Staff Economic Report on Food Chain Profits, FTC Report No. R–6–15–23, for a discussion of the impact of this change in accounting procedure on retailers' profits. Also see note to Appendix Table A.5 in this report.

[14] Phase I of wage-price controls froze retail prices at their Aug. 15, 1971 level for the following 90 days. From Nov. 15, 1971 to Jan. 11, 1973 Phase II price controls permitted a food retailer to increase prices to reflect increased costs so long as his profit margin did not increase over that which prevailed during a designated base period. Compliance was mandatory and enforced by the Internal Revenue Service. Phase III was in effect from Jan. 11, 1973 to Sept. 12, 1973. For most industries Phase III meant self-administration of the Phase II gross margin rule and voluntary compliance. Food retailing was an exception. Phase III was simply the extension of Phase II for another nine months. In addition, consumer concern about high meat prices led the President to establish a ceiling on retail meat prices at their Mar. 29, 1973 level for 5½ months. (During Phase II all retail food prices increased 5.2 percent, but red meat went up 11.8 percent.) ["Phase III Regulation, Questions and Answers," Cost of Living Council, U.S. Government Printing Office, Washington, D.C.] For food retailers, Phase IV, which began on Sept. 13, 1973, meant the decontrol of meat prices, self-administration of the gross margin rule and voluntary compliance. Phase IV ended on Apr. 30, 1974.

[15] "Banking Against A & P: Loans to Help Struggling Supermarket Chains," Time, vol. 100, Dec. 11, 1972, p. 100.

[16] Ibid.

Two fundamental indicators of a firm's competitive market environment are the four-firm concentration ratio and the firm's market share. Figure 1.7 (Chapter 1) shows that the concentration ratio for SMSAs varies considerably. For 194 SMSAs, 10.9 percent had concentration ratios less than 40 percent and 24.7 percent greater than 60 percent in 1972. Table 2.4 summarizes the variation in estimated market shares of the respondent companies. Safeway and Winn-Dixie had the highest average market shares in 1972 with 17.2 and 16.2 percent, respectively. Allied Markets had the lowest with 6.3 percent. A & P was the most geographically dispersed company, operating in 113 of the 153 SMSAs examined. Giant operated in only three SMSAs. In general the larger companies enjoyed somewhat higher average market shares.

TABLE 2.4.—DISTRIBUTION OF MARKET SHARES FOR 14 FOOD CHAINS IN 153 STANDARD METROPOLITAN STATISTICAL AREAS, 1972

Market share	Safeway	A & P	Kroger	Winn-Dixie	Lucky	Jewel	Grand Union	Super General	National Tea	Stop & Shop	Fisher	Albert-son's	Allied	Giant	Total Number	Total Percent
0 to 4.9	5	13	26	1	6	4	7	4	6	3	6	11	9	1	102	24.3
5 to 9.9	4	49	20	4	8	4	5	6	8	2	5	4	4	----	123	29.4
10 to 14.9	8	33	12	9	3	2	4	2	7	4	1	2	3	1	91	21.7
15 to 19.9	14	14	7	4	3	1	1	1	2	3	----	2	1	----	53	12.6
20 to 24.9	6	3	7	5	1	----	----	----	----	1	1	1	----	----	25	6.0
25 to 29.9	6	1	2	4	3	1	----	----	----	----	----	----	----	1	18	4.3
30	4	----	1	----	2	----	----	----	----	----	----	----	----	----	7	1.7
Total	47	113	75	27	26	12	17	13	23	13	13	20	17	3	412	100.0
Average total	17.2	9.9	9.0	16.2	12.9	8.6	7.2	7.1	8.9	11.2	6.8	6.6	6.3	14.9	----	----

Source: "Grocery Distribution Guide 1973," Metro Market Studies, Wellesley Hills, Mass.

Table 2.5 reveals that there is not only substantial inter-firm variation in profit rates but also considerable intra-firm variation. For example, during the 1970–74 period, firm A had one division with an average profit-sales ratio below −3 percent, three above 2 percent, and the remaining 25 divisions were distributed rather evenly in between. Although firm H's divisions were on average more profitable than firm A's, and firm K's divisions on average more profitable than firm H's, both of these companies also experienced considerable intra-firm variation. Clearly, there are strong factors influencing the profitability of individual divisions in addition to the management and operating characteristics of each company.

TABLE 2.5.—FREQUENCY DISTRIBUTION OF AVERAGE DIVISIONAL PROFIT-SALES RATIOS FOR 14 LEADING GROCERY CHAINS, 1970–74

Average divisional 1970–74 profit-sales ratio (percent):	Number of divisions														
	A	B	C	D	E	F	G	H	I	J	K	L	M[1]	N	Total
−3 and less	1														1
−2.9 to −2	2		1							1					4
−1.9 to −1	10							2		1					13
−.9 to 0	6		1			3		4		3		1	1		19
0.1 to 1	3	3	2			2		2		1		1	1		15
1.1 to 2	4			1				2		2	4	1	2	2	18
2.1 to 3	3		1	2	1	1	2	2	3		6		1		22
3.1 and 4		3					1	1			6			4	15
4.1 and over		2					1				2			3	8
Total	29	8	5	3	1	6	4	13	3	8	18	3	5	9	115

[1] Divisions were redefined in 1970. Hence, average profits during 1971–74 were used.
Source: Company data supplied to Joint Economic Committee.

We hypothesize that firm prices and profits in a market are heavily influenced by the structure of that market. The following section of this report involves two tests of the profit portion of this hypothesis. One test employs SMSA data; the second uses division data. Chapter 3 tests the relationship between market structure and prices.

Variables Used in Profit and Price Analyses

Market Structure Variables

1. *Four Firm Concentration Ratio* (CR_4).—The four-firm concentration ratio is the sum of the market shares of the top four firms in a market. It can be used to measure either buyer or seller concentration. In this study, it measures seller concentration. The degree of market concentration is used as an index of market power because it strongly influences the intensity and ways that firms compete with one another.[17] When a few sellers control most sales in a market they tend to behave interdependently rather than as independent competitors. Such interdependence tends to lead to implicit or explicit forms of collusion to enhance profits by maintaining prices above the competitive level. Economic theory does not predict the precise level at which concentration results in an elevation of prices and profits. It

[17] Joe S. Bain, Industrial Organization, Wiley, New York, 1968.

does predict, however, that after some threshold level of concentration is reached, further increases in concentration result in greater interdependence among rivals and hence in higher prices and profit rates. Although the precise nature of this relationship must be determined empirically, we expect that CR_4 will be positively related to both prices and profits. That is, the higher the CR_4 in a market, other things equal, the higher the price level and profit-sales ratio of firms in the market. In interpreting the observed statistical significance of this variable, it should be recalled that often an SMSA does not accurately reflect the actual relevant geographic area of competition Although this error tends to understate CR_4s in most markets, the error is not uniform across markets, thereby tending to bias the statistical results toward zero. That is to say, were it not for errors in defining relevant markets, the level of statistical significance very probably would be higher than those actually reported for CR_4 in the various equations.

2. *Firm Market Share (FMS)*.—This variable measures the percent of a market's sales held by a particular firm.[18] Other things the same, as a firm obtains a higher market share, it becomes a more dominant force in the market. Firms with large market shares enjoy a degree of discretion in pricing and other decisions that are likely to result in higher price and profit levels. In addition, store level and company overhead expenses may be lower for a chain with a high market share.

Of considerable importance in food retailing are the existence of enterprise differentiation [19] and advertising cost advantages conferred on the dominant firm because it can engage in larger scale advertising. As a Food Commission study concluded:

> Because advertising is one of the leading forms of nonprice competition in this industry, the retailer with the largest local advertising budget may have a pronounced advantage over its rivals. This advantage will be reflected in increased demand for the retailer's products and services, as well as lower per-unit advertising cost.[20]

The study then identifies the various ways in which a firm with a strong market position may be able to influence its profit margins. These include: [21]

(*a*) Charge higher prices.

(*b*) Offer fewer specials with sharply reduced prices, thereby selling a greater percentage of high margin items.

(*c*) Provide fewer services to customers, thereby reducing operating costs.

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[18] Estimates of 1972 firm market shares were based upon either company data supplied to the Joint Economic Committee or data from 1974 Grocery Distribution Guide. Market share estimates based on company data were derived by computing the company's 1972 SMSA sales as a percentage of the 1972 Census total grocery store sales in each SMSA. In those SMSAs where no company data were available, firm market shares were estimated by multiplying the firm's market share (as reported in the 1974 Grocery Distribution Guide) by the ratio of the 1972 Census four-firm concentration ratio to the four-firm concentration ratio calculated from the 1974 Grocery Distribution Guide. The price analysis models used both 1972 and 1974 estimates of firm market shares. For estimation procedure, see Appendix B.

[19] The term "enterprise differentiation" is used instead of the more familiar "product differentiation" to avoid confusion. The "product" of food retailers can be viewed as the bundle of merchandise, service, store facilities, location, and other nonprice factors which influence consumer store selection decisions. Thus, enterprise differentiation is simply a broad interpretation of product differentiation.

[20] National Commission on Food Marketing Technical Study No. 7, Organization and Competition in Food Retailing, U.S. Government Printing Office, June 1966, p. 362.

[21] Ibid., pp. 362–363.

(*d*) Operate stores nearer capacity, thereby capturing the lower costs associated with high store utilization.

The various factors associated with a leading position in a market gives dominant grocery retailers an advantage over both smaller rivals and potential entrants. Thus, in those markets where a dominant firm exists, high entry barriers are likely also and give dominant firms the freedom to engage in noncompetitive behavior without attracting new competitors.[22]

Based on the above, we hypothesize that, other things remaining the same, the greater a firm's market share the higher are its prices and its profit margins.

3. *Relative Firm Market Share (RFMS)*.—RFMS is an alternative to FMS as a means of measuring firm dominance vis-a-vis its leading rivals. A firm's relative market share is the ratio of its market share to the four-firm concentration ratio. Whereas FMS measures a firm's absolute share of the entire market, RFMS measures a firm's size relative to the leading firms in a market. We believe RFMS is preferable to FMS because a firm's discretion in pricing and its cost advantage or disadvantage depends largely on its relative position in the market. Market share is more directly related to the realization of absolute scale economies in a particular market. On the other hand, relative market share measures relative scale economies that may exist; that is, the cost advantage that one firm has relative to its major competitors. RFMS is also a superior measure of the degree of enterprise differentiation among firms in a market.[23]

A simple numerical example illustrates the difference between FMS and RFMS. A firm with a 15 percent market share in a market where the next three firms each hold 5 percent of the market would be expected to enjoy a much stronger competitive position than if the other three firms also each held 15 percent of the market. While the market share for the firm is identical in the above two examples, its relative market share is 0.5 in the first case and 0.25 in the second. Because RFMS measures the relative competitive position of a firm in a market it is more appropriate than FMS in cross sectional analyses involving many markets. In addition, since FMS is much more closely correlated with CR_4 than is RFMS, RFMS also is preferred on statistical grounds.

We hypothesize that this variable, like FMS, will be positively related to both price levels and profits.

4. *Mean Store Size (SS)*.—SS measures the average sales per grocery store with payroll in each SMSA in 1972. This variable was included in the regression models to adjust for differences in the importance of supermarkets vis-a-vis small stores in various SMSAs. Since supermarkets account for about 75 percent of all grocery store sales, set the competitive tone in most markets, and compete only indirectly with smaller grocery stores, concentration in the supermarket sub-

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[22] Joe S. Bain, Barriers to New Competition, 1956.

[23] For other studies using this variable, see FTC, Economic Report on the Influence of Market Structure on Profit Performance of Food Manufacturing Companies, 1969, pp. 10–11; also B. Imel, M. Behr, and P. H. Helmberger, Market Structure and Performance, 1972. John M. Connor and Willard F. Mueller, Market Power and Profitability of Multinational Corporations in Brazil and Mexico, Report to the Subcommittee on Multinational Corporations of the Committee on Foreign Relations, U.S. Senate, August 1976.

market is a better indicator of market power conditions than concentration within all grocery stores. At the time of this analysis, however, data were not available on supermarket concentration .(When supermarket concentration ratios subsequently became available, several regressions were re-run using these ratios. The results are reported in Appendix Table B.15.)

Mean store size provides a surrogate measure of the importance of supermarkets in different markets. In markets with many small stores, the Census CR_4 (based upon all grocery stores) will be a poorer measure of supermarket concentration than in SMSAs in which small stores are a minor element. Thus, the understatement of CR_4 will be inversely related to mean store size. Insofar as the store size variable (SS) corrects partially for such understatements, we hypothesize that SS will be negatively related to both profits and prices.

Other Independent Variables

5. *Market Growth (MG).*—Market growth is defined as the percentage change from 1967 to 1972 in deflated grocery store sales in each SMSA as reported by the U.S. Census. Market growth is thus a measure of the growth in demand.[24] Its influence depends, in part, on the rate at which grocery store capacity expands. If capacity expansion lags behind market growth as we expect, excess demand is likely to exist in the market, resulting in higher utilization of existing facilities. Since higher utilization of existing facilities is expected to lower retailing costs per dollar of sales, profits in excess demand markets would tend to be higher even if prices are not increased.

The influence of excess demand on price levels is less clear. Excess demand is frequently expected to lead to higher prices as interested buyers "bid up" the available supply. However, it is also easier to enter rapidly growing markets. Established firms may elect to not increase prices and maximize short-run profits lest they encourage entry. Indeed, they may lower prices to forestall entry. If average retailing costs decline with excess capacity, as expected, retailers may be able to charge lower prices in rapidly growing markets in order to forestall entry and maintain or expand market share and still realize profits that are comparable to or greater than the profits in slower growing markets.

The expected influence of market growth is therefore mixed. Although we hypothesize a positive relationship to profits, we are unable to hypothesize an expected relationship between market growth and price levels.

6. *Market Size (MS).*—Market size is defined as the 1972 sales of grocery stores with payroll for each SMSA as reported by the U.S. Census. The size of a market is expected to influence the profits and prices of retail operations in two ways. Very large SMSAs such as New York, Los Angeles and Chicago are actually made up of several smaller economic markets. For example, consumers in southern Chicago or the central city are not likely to travel to suburban Chicago

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[24] Comparable geographic areas were used in estimating the growth in market demand over the 1967–1972 period. For those SMSAs whose definition changed between 1967 and 1972, the 1967 grocery store sales were adjusted to reflect the definitional change before computing market growth.

to buy groceries. To the extent that retail grocery firms hold stronger market positions in certain parts of an SMSA and weaker (or are not present) in others, then our structural variables do not accurately reflect actual market structure in the relevant submarkets. In these cases, market share and concentration figures will be understated. Since this problem of market fragmentation increases with the size of the SMSA, the market size variable is expected to explain some of the differences in profits which concentration or market share would explain if they were properly measured. Based upon this rationale, market size is expected to be positively related to profits and price levels.

A large market also allows for larger total sales by retail firms and the potential for greater economies of scale in warehousing, physical distribution, supervision, and advertising. These factors would tend to result in somewhat lower prices in large markets, other things remaining the same.

Thus, market size is included as both an adjustment for CR_4 and RFMS, as well as a proxy for the level of costs in different size markets. We hypothesize a positive relationship between market size and profits; because market size may influence price levels in contrary directions, we are unable to predict the net relationship between market size and price levels.

7. *Impact of A & P (API).*—This variable was included in the analysis to measure A & P's presence as a competitor in a market or geographic area. In the analysis of divisional profit performance, it is measured by the proportion of a division's sales that were derived from SMSAs in which A & P was present. Thus, if a division contained two SMSAs from which it realized equal sales, and if A & P was present in only one, the A & P impact variable would have a value of 0.50. In the SMSA analysis, A & P's presence is measured by a binary variable. A value of one indicates that A & P operates in that SMSA; a value of zero indicates A & P is not present.

A & P was singled out as a particularly important competitor because of its precipitous decline in market share in many markets prior to and during the period being studied, and because of the WEO program launched in 1972. The aggressive price competition provided by WEO is expected to have a negative impact on the profits of firms competing with A & P in 1972 and to a lesser extent in 1973. In the remaining years (1970, 1971, 1974), A & P appears to have been a "weak" competitor whose presence likely enhanced the profits of competing firms.

Thus, we hypothesize a positive relationship between API and profits during 1970, 1971, and 1974 and a negative relationship during 1972 and 1973. For the entire five year period, a positive relationship is expected.

8. *A & P Company (APC).*—In the division profit analysis, the API variable discussed above does not distinguish between the self-inflicted effect of WEO and inferior operations on A & P's profits and their impact on the profits of A & P's competitors. To overcome this problem, an A & P binary variable was specified in which A & P divisions were given a value of 1 and other chain divisions a value of zero.

This variable enables analysis of the direct impact of A & P's WEO program on its own profitability as opposed to its impact on the profits

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of chains in direct competition with A & P. This variable was also included to reflect the fact that for over a decade A & P has had profit rates well below the industry average. The persistence of A & P's poor profit showing suggests that although the various market and other variables discussed above may explain differences in the profitability of A & P's various divisions, other forces unique to A & P are responsible for its persistently lower average profit rate.

For these reasons we hypothesize that APC will have a negative sign in both the five-year average and in the annual profit models. However, the absolute value of the coefficient should attain a peak in the annual regressions in 1972 to reflect the lower profits A & P divisions experienced during the height of the WEO program.

9. *Firm Growth (FG).*—Industrial organization theory attempts to predict the performance of groups of firms or entire industries. As such, it deals with the average performance that would be expected with different industry structures. The performance of individual firms is expected to deviate from the central tendencies predicted by this theory. Because the present analysis deals with differences in the profits of individual grocery chains, we expect that part of the variation in individual chain profits is attributable to reasons unrelated to the structure of the markets in which they operate.

Perhaps the main such nonstructural variable influencing profits is the caliber of management. We would expect managerial differences to be reflected in the past and current success of a chain in achieving operating efficiencies and in developing a unique store image and consumer preference for its services. Insofar as a chain is more successful in the above respects than are its rivals, we would expect such success to be reflected in higher growth rates. We therefore have incorporated a firm growth (FG) variable as a proxy for the relative success of a chain (whether due to managerial superiority, successful product differentiation, or good luck). For each chain this variable measures the internal growth (i.e., excluding mergers) in the company's total grocery store sales between 1970 and 1973.[25] All division and SMSA observations for a company have the same value, for example, 55 percent for Winn Dixie. We hypothesize that this variable will be positively related to a chain's profits.

It is possible that this variable reflects some underlying structural variables. Specifically, if a firm holds a more dominant relative market position (RFMS) than other chains, and/or it operates in more highly concentrated markets than do other chains, it has a greater financial capability for growth. Hence a firm's observed growth rate may in part be due to the structural characteristics of the markets in which it operates.

10. *Entry (E).*—Entry is included to identify and measure the profit impact of the act of entry on entering firms. Since the barriers to entry for any market are expected to affect the "cost" of entry, this variable is specified accordingly. E has a value of zero for established firms in a market. For firms that entered a market between 1967 and

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[25] These years were chosen rather than 1970 to 1974 because grocery store sales data were not reported for all four quarters in 1974.

1970. E is equal to the 1972 four-firm concentration ratio for the SMSA.

Entering a new market is more difficult than expanding operations in established markets because of the barriers to entry which exist in many markets. Bain says a barrier to entry exists if ". . . any one or a few firms in a [market] can obtain some long-term strategic advantage over all actual and potential competitors." [26]

There are three major barriers to entry in grocery retailing that give the leading firms in a market long-term strategic advantages. First, it is highly probable that these firms have control over many of the preferred sites for new supermarkets in their market.[27] Since these sites are an essential resource for supermarket operations, their control strongly influences entry.

Secondly, leading established firms enjoy considerable sales promotion and enterprise differentiation advantages over entering firms. Not only can leading firms spread current advertising expenditures over a larger sales volume, but they also may have established consumer loyalties based upon their past merchandising efforts and spatial distribution of stores.

Finally, as the number of firms in a market declines and their share of the market increases, the probability increases that an entering firm will be in direct competition with the established market leaders. The entering firms then confront a displacement problem. They must either risk incurring losses as they try to capture (at the expense of existing firms) a sufficient share of the market to operate efficiently, or settle for a smaller share than is required to operate at an efficient scale of operations.

As concentration in a market increases, entry barriers are expected to increase also. High entry barriers are more difficult and costly to overcome than low entry barriers. Thus, the act of entry is expected to have a negative influence on the profits of entering firms; further, the magnitude of this negative influence is expected to be directly related to the four-firm concentration ratio, which influences the height of entry barriers.

Dependent Profit Variables

11. *Profit-Sales* (*P/S*).—The profit-sales ratio for a firm in a market (division or SMSA) is defined as the net profits before taxes divided by the firm's sales in that market. Alternative profit measures such as return on assets or stockholder's equity were not employed in this analysis due to the unavailability of asset or stockholder equity data at the division or SMSA level. The profit-sales ratio, although lacking in comparability with other industries, is an accurate measure of relative profitability of firms within an industry.[28]

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[26] Joe S. Bain, Industrial Organization, op. cit., p. 204.

[27] National Commission on Food Marketing, Organization and Competition in Food Retailing, op. cit., pp. 155–57.

[28] We have included only those chains that appear to use similar accounting procedures in developing their profit-to-sales ratios. However, it is impossible to determine whether identical procedures were used in all cases. Insofar as differences exist among the chains in our sample, this would tend to bias our results toward zero, i.e., it would reduce the observed levels of significance of our models.

Profit Models

Division and SMSA profit-sales ratios were examined using the following basic models:

(1) Division $P/S=\alpha_0+\alpha_1 RFMS+\alpha_2 CR_4+\alpha_3 FG+\alpha_4 MG+\alpha_5 MS+\alpha_6 APC+\alpha_7 API$

Hypothesis: $\alpha_1>0$ $\alpha_2>0$ $\alpha_3>0$ $\alpha_4>0$ $\alpha_5>0$ $\alpha_6<0$ $\alpha_7>0$

(2) SMSA $P/S=\beta_0+\beta_1 RFMS+\beta_2 CR_4+\beta_3 SS+\beta_4 E+\beta_5 FG+\beta_6 MG+\beta_7 MS+\beta_8 API$

Hypothesis: $\beta_1>0$ $\beta_2>0$ $\beta_3<0$ $\beta_4<0$ $\beta_5>0$ $\beta_6>0$ $\beta_7>0$ $\beta_8>0$

Where:

P/S = Divisional or SMSA profit-sales ratio.
RFMS = 1972 relative firm market share.
CR_4 = 1972 four-firm concentration ratio. A curvilinear form of this variable (CCR_4) was used in several models.
SS = 1972 mean sales per grocery store within an SMSA.
E = Identifies the SMSAs which sample firms entered between 1967 and 1970; the 1972 CR_4 in these markets is used as an estimate of entry barriers.
FG = Firm growth as measured by the percentage increase in grocery store sales between 1970 and 1973.
MG = 1967 to 1972 percentage real growth in the grocery store sales in a division or SMSA.
MS = 1972 market size (dollar grocery store sales).
APC = Binary identifying A & P divisions.
API = Variable used to indicate the presence or absence of A & P in a market or division.[29]

Results of Profit Analysis

As noted above, during 1970–1974 there was considerable variation in the profitability of various chains as well as among the divisions of individual chains. Additionally, profitability varied considerably from one year to the next. Two data sets were used to explore the relationships between chain profitability and various market structure and other variables. The first set of data consisted of pretax profit-sales ratios and other data for 96 divisions of 12 food chains.[30] The second data set consisted of pretax profit-sales ratios and other data for six chains in 50 Standard Metropolitan Statistical Areas (SMSAs). There were 72 observations because in some instances more than one of the firms operated in an SMSA. To isolate the effects of various factors believed to have a potential influence on profitability, multiple regression analysis was employed.

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[29] In the SMSA analysis, this was a binary variable with a value of one for markets in which A & P was present. In the division profit analysis, the variable was a weighted binary which took on values from 0 to 1.0. API is hypothesized to have a positive influence on division and SMSA profits during 1970, 1971 and 1974, but a negative influence during 1972 and 1973.

[30] The divisional sample is identical to the one displayed in Table 2.5 with a few exceptions. Firms C and M were excluded because of the lack of division definitions. An additional nine divisions were not included either because they involved entry into a new SMSA, or because they did not contain an SMSA. The end result of these deletions is a sample with 96 observations.

Divisional Profit Analysis

This analysis examines the statistical relationship between the dependent variable P/S (the profit-to-sale ratio of each division) and the various independent variables identified above.[31] Pretax profit-to-sales ratios (P/S) were available for each year during 1970–74, whereas the various explanatory variables (except market growth and firm growth) were constructed for 1972. Although use of a single year for CR_4 and other independent explanatory variables may introduce some errors into the results, we believe this does not seriously bias the findings because structural variables tend to be quite stable over short periods.[32]

The hypothesized relationship between market structure and profit rates is assumed to be long-run in nature. Short-term factors such as temporary price wars, local strikes or depressed local business conditions, and price controls may distort this relationship in some or all areas in a particular year. The most common method of controlling for such short-term disturbances is to average the data for several years on the assumption that short-run abberrations in the data will be offsetting over time. Five-year average proft rates are used in the first three regression models shown in Table 2.6.

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[31] Data on the independent variables were not available for the entire areas served by various company divisions. Thus, in order to relate division profits to the structure of the market(s) and other market characteristics within each division, weighted independent variables were computed. The weighted values were based upon the characteristics of the SMSAs within each division. The CR_4, RFMS, market size, market growth, and API values for each SMSA were multiplied by the sales of the firm in that SMSA. The sum of these values over all SMSAs within a division were then divided by the total sales of the division in the SMSAs to obtain the appropriate weighted value for each variable. For example, if a division has annual sales of $100 million and $75 million are derived from the two SMSAs in the division, a weighted CR_4 for the division would be computed as follows:

	(1) CR_4	(2) Sales	(3) (1)x(2)	
SMSA No. 1	30	60,000,000	1,800	$\frac{2,550}{75}=34$ (weighted CR_4)
SMSA No. 2	50	15,000,000	750	
Total		75,000,000	2,550	

This procedure ignores the structure of towns and small cities within the division but outside any SMSA. (In the above example, $25 mililon of the division's sales are derived from non-SMSA areas.) It is assumed, however, that the weighted CR_4, firm market share, and other variables computed in the above manner are reasonable estimates for the entire division. Since the CR_4 and RFMS in small cities tend to be higher than in large cities, this procedure tends to understate the weighted CR_4 and RFMS for a division and overstate market size.

[32] Joe S. Bain, "The Comparative Stability Market Structure," in Bain, Essays on Price Theory and Industrial Organization, 1972. Insofar as this assumption is not met, it tends to bias our results toward zero, i.e., it makes our statistical findings appear weaker than they actually are.

TABLE 2.6.—MULTIPLE REGRESSION EQUATIONS EXPLAINING DIVISION PROFIT-SALES RATIOS FOR 12 COMPANIES, 96 DIVISIONS, 1970–74

Dependent variable, profit sales ratio (P/S)	Intercept	Independent variables [1]: Relative firm-market share (RFMS)	4-firm concentration ratio (CR_4)	Curvilinear 4-firm concentration (CCR_4) [2]	Firm growth (FG)	Log firm growth (LNFG)	Market growth (MG)	Market growth squared (MG^2)	Market size (MS)	Market size squared (MS^2)	A & P company (APC)	A & P impact (API)	R^2 [3]	F value
1a. 1970–74 average	−3.198	0.077	0.010		0.045		0.038		−0.708		−0.744		0.837	[4] 65.13
		[4] (8.194)	(.801)		[4] (7.774)		[4] (3.987)		(.684)		[4] (2.595)			
1b. 1970–74 average	5.519	.078	.008		0.46		.042		−.088		−.833	0.390	.844	[4] 59.39
		[4] (8.354)	(.663)		[4] (7.933)		[4] (4.266)		(.562)		[4] (2.893)	[6] (1.416)		
1c. 1970–74 average	−3.225	.065		3.394	1.547		0.059	−1.807	0.525	−1.090	.347	.887	[4] 75.94	
		[4] (7.728)		[4] (2.499)	[4] (8.405)		[4] (4.148)	[4] (3.262)	[4] (3.189)	[4] (3.734)	[6] (1.459)			
2. 1970	−5.196	.066		3.181	1.031		.080	−2.302	.720	−.972	.532	.805	[4] 39.82	
		[4] (5.468)		[5] (1.663)	[4] (3.902)		[4] (3.711)	[4] (3.038)	[4] (3.175)	[4] (2.640)	[6] (1.492)			
3. 1971	−8.275	.066		5.455	1.142		.065	−2.455	.677	−1.177	.503	.799	[4] 38.32	
		[4] (5.480)		[4] (2.838)	[4] (4.340)		[4] (3.082)	[4] (3.203)	[4] (2.959)	[4] (3.074)	[6] (1.435)			
4. 1972	−11.203	.077		5.355	1.754		.078	−1.980	.568	−2.327	−.113	.783	[4] 34.85	
		[4] (5.935)		[4] (2.572)	[4] (6.164)		[4] (3.449)	[4] (2.381)	[4] (2.286)	[4] (5.571)	(.298)			
5. 1973	−8.529	.070		1.003	1.994		.053	−1.402	.426	−.500	.444	.756	[4] 30.25	
		[4] (6.067)		(.536)	[4] (7.851)		[4] (2.705)	[5] (1.850)	[5] (1.889)	[6] (1.268)	[6] (1.342)			
6. 1974	−6.373	.057		1.359	1.662		.032	−1.050	.260	−.408	.295	.805	[4] 40.01	
		[4] (5.187)		(.766)	[4] (6.808)		[6] (1.609)	[6] (1.491)	(1.235)	(1.178)	(.900)			

[1] P/S, RFMS, CR_4, and FG are expressed as percentages. LNFG is the natural logarithm of FG. MG is expressed in percentages; MG^2 is the percentage of market growth squared and divided by 100. MG is expressed in billions of dollars.

[2] $CCR_4=(CR_4+\alpha)^3/1-3(CR_4+\alpha)+3(CR_4+\alpha)^2$. This function of CR_4 has positive slope and is symmetric about an inflection point. The inflection point of the curve occurs at the concentration ratio which satisfies the following equation: $CR_4=0.5-\alpha$. For all equations in this table $\alpha=0.20$ so the inflection point of the curve is $CR_4=0.30$.

Because of computation procedures, R^2 values in table 2.6, 2.7, and 2.8 are not comparable to those in table 3.3. For care needed in interpretation, see footnote 33.

[4] Significance level equals 1 percent.

[5] Significance level equals 5 percent.

[6] Significance level equals 10 percent.

Note: 1 tailed t tests were used in all cases.

Equation 1a is a linear model including six independent variables.[33] All of the variables have the hypothesized sign and are statistically significant at the 1 percent level except CR_4 and MS. The F test for the entire model is significant at the 1 percent level.

The A & P impact variable (API) is included in equation 1b. Although it has a modest postive influence on profits as hypothesized, it is not statistically significant and has no appreciable effect on other variables.

Equation 1c is identical to 1a except that nonlinear functional forms were fitted to the four-firms concentration ratio (CR_4), firm growth, market growth, and market size. All variables are statistically significant at the 1 percent level in this equation except API, which is significant at the 10 percent level.

The most significant finding of the divisional profit multiple regression analysis is that in equations 1a–1c, the two structural variables, RFMS and CR_4, have the expected positive signs. RFMS is statistically significant at the 1 percent level in all equations and CR_4 is statistically significant at the 1 percent level when in a nonlinear form. This indicates that, when all other things remain the same, the higher a firm's RFMS and the higher the level of average CR_4 in the SMSA, within a division, the greater are its divisional profits.

Because equation 1c is the most general and robust model, we shall examine briefly the relationship between the other independent variables and the profit-sales ratio.

Firm growth is introduced in logarithmic form (LNFG). It has the expected positive sign and is highly significant. This finding substantiates the hypothesis that the profit rates of an individual chain are determined by factors unique to it as well as by the structure of the markets in which it operates and the other variables used in the analysis.[34]

Market growth is introduced quadratically (MG^2). It is significant at the 1 percent level. All else remaining the same, profits tended to be highest in those divisions where grocery store sales had grown most rapidly between 1967 and 1972. This is consistent with our hypothesized relationship between market growth and profits.

Market size is introduced as a complete quadratic (MS, MS^2). For divisions in which average SMSA grocery store sales exceeded $1.7 billion, there is a positive relationship between profits and market size. This is consistent with the original hypothesis on scale economies and

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[33] Preliimnary investigations revealed that both samples were heteroskedastic. When ordered by firm growth, the variance of the regression residuals became progressively larger as firm growth decreased. This phenomenon is intuitively plausible because it implies that poorly managed firms not only have lower expected rates of profits but also greater variation in the rate of profit for a given market structure. Poor management is synonymous with erratic and unpredictable results.

Heteroskedasticity does not require us to alter our theoretical predictions of the relationship between market structure and performance. It does, however, have serious implications for testing these hypotheses. If ordinary least square estimation techniques are used, one obtains unbiased estimates of the model's coefficients, but the t-ratios which measure the reliability of these estimates are biased in an unknown direction. A test may assert that a variable is insignificant when in fact it is, and vice versa. Both unbiased coefficient estimates and t-ratios were obtained in this report by using a generalized least squares estimation technique. To construct the generalized weighting matrix it was assumed that the residual variance was proportional to the natural logarithm of firm growth.

[34] Firm growth significantly improves the explanatory power of the overall model, although its inclusion slightly reduces the significance of other variables, reflecting some collinearity between it and some other variables.

market misdefinition. Most market sales, however, are less than $1.7 billion. In this range market size is negatively related to profits, which is contrary to the hypothesized relationship. This indicates that some other characteristic of market size than market misdefinition is working to reduce profits in large cities. A plausible explanation is that many of the chains in the sample operate a substantial number of stores in low income areas of large cities. Other studies have shown that the net profits of chain stores operating in such areas are substantially lower than in other areas.[35] If so, other things remaining the same, we would expect such chains to have relatively lower profits in large cities, where the cost increasing factors associated with central city operations are most common. This could explain why profits and market size are negatively related over a wide range, but become positively related in very large cities, where the effect of market misdefinition is sufficiently great to offset the influence of low profits in central cities. The market size-profit relationship identified by our model, while unexpected, could be the net result of these two countervailing forces.

The A & P company (APC) variable was included in the analysis to test the hypothesis that, other thing remaining the same, A & P has a significantly poorer profit performance than other chains. It also permits identification of the impact of A & P's WEO program on its own profitability as opposed to its impact on the profits of competitors in direct competition with A & P. APC had the hypothesized negative sign and is statistically significant.[36]

The A & P impact (API) variable is marginally signficant at the 10 percent level. This is consistent with our hypothesis that, on average, firms in competition with A & P have had higher profits in recent years.

Profit Equations for Individual Years.—The model shown in equation 1c is tested for individual years in equations 2 through 6. The results are generally consistent with those discussed above; however, several of the variables behave in a significantly different manner in particular years.

WEO depressed significantly A & P's profits relative to its competitors. Whereas the coefficient of APC is negative in all years, it attains its lowest value in 1972 when the average A & P division profits were 2.32 percentage points lower than its average competitor.

The A & P impact variable (API) generally performs as hypothesized. In 1970 and 1971, chains competing with A & P had significantly higher profits than those that did not. In 1972, however, they had lower profits, but the relationship was not statistically significant. In 1973 and 1974, chains competing with A & P again enjoyed higher profits, but the relationship was only statistically significant in 1973.

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[35] Donald R. Marion, Food Retailing in Low-Income Areas—An Economic Analysis, Cooperative Extension Service, University of Massachusetts, Publication No. 100, June 1974, p. 44.

[36] The coefficient on APC measures the average difference of A & P divisions from those of its competitors, not from all other firms in the sample. To obtain the latter one must take the sum of the coefficients on the APC and API variables. Based upon equation 1c, for example, A & P's average division profit-to-sales ratio is 1.09 percentage points lower than its competitors and .74 percentage points (−1.090+.347) less than companies with which it does not compete.

Divisional Profit Analysis: Controlling for A & P by Excluding A & P Divisions

There is little question that during the 1970–1974 period, A & P pursued unique sales and profit strategies. Under WEO, its avowed purpose was to expand sales in order to recoup eroded market share. A & P apparently hoped its strategy of deep price cuts would regain its lost stature. Insofar as this strategy resulted in a uniformly lower rate of profit for each A & P division, independent of market structure, the APC variable is an effective means of control. However, if A & P's offensive tactics were not independent of market structure, then the coefficients in Table 2.6 are biased. One way to control for this possibility is to drop the A & P observations from the sample. This was done in the equations displayed in Table 2.7. The complete model for the five year average (equation 1c) is very similar to its counterpart, equation 1c, Table 2.6, which includes A & P observations and the binary control variable, APC. These results imply that APC is an effective control for A & P's unique strategies and that the coefficients of Table 2.6 are unbiased.

TABLE 2.7.—MULTIPLE REGRESSION EQUATIONS EXPLAINING DIVISION PROFIT-SALES RATIOS FOR 11 COMPANIES, 68 DIVISIONS, 1970–74 [1]

Dependent variable, profit-sales ratio (P/S)	Intercept	Independent variable: Relative firm-market share (RFMS)	4 firm concentration ratio (CR_4)	Curvilinear 4 firm concentration (CCR_4) [2]	Firm growth (FG)	Log firm growth (LNFG)	Market growth (MG)	Market growth squared (MG^2)	Market size (MS)	Market size squared (MS^2)	A&P impact (API)	R^2	F value
1a. 1970–74 average	−2.855	0.070	0.010		0.046		0.032		−0.140			0.878	[3] 74.25
		(6.964)	(.757)		[3] (7.992)		[3] (3.158)		(.779)				
1b. 1970–74 average	−5.238	.057		4.191		1.500		0.049	−1.833	0.539		.921	[3] 101.37
		[3] (6.568)		[3] (3.040)		[3] (8.554)		[3] (3.524)	[3] (3.192)	[3] (3.058)			
1c. 1970–74 average	−8.226	.058		3.833		1.523		.053	−1.910	.550	0.311	.927	[3] 95.20
		[3] (6.672)		[3] (2.747)		[3] (8.695)		[3] (3.840)	[3] (3.216)	[3] (3.119)	[6] (1.381)		
1d. 1970–71, 1974	−7.005	.052		3.994		1.295		.047	−2.086	.577	.394	.923	[3] 89.59
		[3] (5.669)		[3] (2.708)		[3] (7.046)		[3] (3.080)	[3] (3.392)	[3] (3.141)	[5] (1.615)		
2. 1970	−4.530	.056		2.308		1.006		.067	−2.219	.672	.453	.872	[3] 50.85
		[3] (4.832)		(1.269)		[3] (4.391)		[3] (3.208)	[3] (2.949)	[3] (2.977)	[5] (1.419)		
3. 1971	−7.866	.056		5.456		1.157		.047	−2.380	.643	.391	.869	[3] 49.51
		(4.735)		[3] (2.896)		[3] (4.912)		[3] (2.331)	[3] (3.053)	[3] (2.751)	(1.227)		
4. 1972	−10.138	.075		4.003		1.809		.066	−1.801	.540	−1.06	.848	[3] 41.94
		[3] (6.537)		[4] (2.175)		[3] (7.862)		[3] (3.331)	[3] (2.365)	[3] (2.364)	(.340)		
5. 1973	−9.267	.063		2.412		1.904		.064	−1.691	.515	.439	.867	[3] 49.70
		[3] (6.076)		[5] (1.432)		[3] (9.039)		[3] (3.773)	[3] (2.375)	[3] (2.431)	[5] (1.606)		
6. 1974	−7.315	.045		3.427		1.614		.029	−1.814	.443	.206	.884	[3] 57.16
		[3] (4.266)		[4] (2.019)		[3] (7.590)		[5] (1.572)	[3] (2.585)	[3] (2.108)	(.712)		

[1] These are the same chains as those in equations in table 2.6 except that A&P is not included.
[2] Same as footnote in table 2.6.
[3] Significance level equals 1 percent.
[4] Significance level equals 5 percent.
[5] Significance level equals 10 percent.

Equation 1d provides an alternative means of isolating the impact of the WEO program and price controls by omitting 1972 and 1973 profit data. When profits are averaged for the three most "normal" years, 1970, 1971 and 1974, the overall results are very similar to the five year average results of equation 1c. The intercept value for the three year model is larger, reflecting the higher profit levels during 1970, 1971 and 1974 than during 1972 and 1973. A & P is also found to have had a stronger positive influence on the profits of its competitors during the three "normal" years than during the entire five year period. This is as expected.

The annual equations demonstrate similar patterns to those in Table 2.6 for the coefficients of all variables except CCR_4. In Table 2.6, CCR_4 loses statistical significance in 1972 and 1973. When A & P divisions are excluded (Table 2.7), CCR_4 remains statistically significant in 1973 and 1974.

Appendix Table B.13 confirms what the above results suggest. During 1973 and 1974, four firm concentration has a negative and insignificant influence on the profits of 28 A & P divisions. The regression equations for these two years are not significant and explain only 27 to 30 percent of the variation in division profits. Regression equations for the three years 1970 to 1972 are highly significant and explain over 50 percent of the variation in profits. A marked change in A & P behavior obviously occurred during the last two years of the five year period studied.

Appendix Table B.14 summarizes the regression analysis of the profit-sales ratios of 50 divisions from 11 companies which competed directly with A & P. The results are generally similar to those in Tables 2.6 and 2.7.

SMSA Profit Analysis

Profit and sales data on an SMSA basis were provided by six chains for 50 different SMSAs. These data were less aggregated than the divisional data which generally included more than one SMSA. Because the SMSA data were less aggregated, the regression models using these data may be more discriminating in identifying the impact of various factors on the profitability (P/S) of different companies in different SMSAs.

The same basic variables and functional forms were used in the SMSA analysis as the divisional analysis summarized in Table 2.6.[37] Two additional variables were included: mean store size (SS) and entry (E).

All four equations using average P/S data for 1970–1974 are statistically significant at the 1 percent level (Table 2.8). The two structural variables, RFMS and CR_4 have the hypothesized positive sign and are statistically significant at the 5 percent level in equations 1a–1d. In equation 1d, which is the most complete model, RFMS and CR_4 are significant at the 1 percent level. The entry and firm growth variables also have the expected signs and are highly significant. Including mean store size (SS) in equation 1b improves the level of significance of CR_4, as expected. The other variables perform in about the same manner as in equation 1d, Table 2.6.

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[37] A & P was not one of the six chains in this sample.

Equations 2 to 6 in Table 2.8 examine the relationships for individual years. The market structure, entry and firm growth variables always have the expected sign and, except for CR_4, are always significant at the 5 percent level. This is a remarkably strong showing for analyses based on data for individual years.

The entry variable (E) behaves as predicted. Although it is negative and statistically significant in all years, the value of the regression coefficient is greatest in 1970 and declines thereafter. Since this variable measures entry that occurred during 1967 to 1970, the results indicate the expected—that a new entrant's profits are lowest in the first years of its entry into a new market.

The API variable behaves rather erratically in the SMSA models for individual years. This is partly attributable to collinearity with mean store size and CCR_4. In 1970, A & P's presence in a market tended to depress profits of rival chains. In 1971 and 1972 chains tended to have slightly higher profits in markets where they competed with A & P. In 1973 and 1974 this gap widened, so that by 1974, other things remaining the same, chains made substantially higher profits in markets where A & P was a competitor. This suggests that by 1974, in the aftermath of WEO, A & P exerted less competitive pressures on rival chains' profits than it had in 1970.

TABLE 2.8.—MULTIPLE REGRESSION EQUATIONS EXPLAINING SMSA PROFIT-SALES RATIOS FOR 6 COMPANIES IN 50 SMSA's, 1970–74 [1]

Dependent variable, profit-sales ratio (P/S)	Intercept	Independent variables [2]: Relative firm-market share (RFMS)	4-firm concentration ratio (CR_4)	Curvilinear 4-firm concentration (CCR_4) [3]	Mean store size (SS)	Entry (E)	Firm growth (FG)	Log-firm growth (LNFG)	Market growth (MG)	Market growth squared (MG^2)	Market size (MS)	Market size squared (MS^2)	A & P impact (API)	R^2	F value
1a. 1970–74 average	−3.579	0.062	0.023			−0.046	0.044		0.030		0.122			0.817	[4] 41.33
		[4] (5.677)	[5] (1.786)			[4] (6.104)	[4] (6.694)		[4] (2.904)		(.706)				
1b. 1970–74 average	−3.137	.062	.030		−1.000	−.044	.045		.029		.254			.825	[4] 37.75
		[4] (5.697)	[5] (2.273)		[5] (1.715)	[4] (5.846)	[4] (6.892)		[4] (2.884)		[6] (1.356)				
1c. 1970–74 average	−7.434	.064		3.470	−.918	−.032		1.601		0.048	−1.835	0.592		.854	[4] 40.95
		[4] (6.554)		[4] (2.505)	[5] (1.679)	[4] (4.469)		[4] (8.036)		[4] (3.331)	[4] (3.101)	[4] (3.528)			
1d. 1970–74 average	−8.098	.065		3.020	−.524	−.032		1.719		.049	−1.805	.577	0.380	.856	[4] 36.69
		[4] (6.691)		[4] (2.117)	(.830)	[4] (4.461)		[4] (7.796)		[4] (3.431)	[4] (3.057)	[4] (3.440)	[6] (1.261)		
2. 1970	−8.351	.083		8.228	−.767	−.062		.959		.046	−3.260	.985	−1.089	.699	[4] 24.19
		[4] (4.105)		[4] (2.757)	(.585)	[4] (4.198)		[5] (2.081)		[6] (1.527)	[4] (2.630)	[4] (2.799)	[5] (1.742)		
3. 1971	−8.061	.085		5.178	−.115	−.036		1.266		.057	−2.232	.656	.630	.788	[4] 23.08
		[4] (5.381)		[4] (2.308)	(1.245)	[4] (4.038)		[4] (3.453)		[4] (2.793)	[4] (2.417)	[4] (2.514)	[6] (1.427)		
4. 1972	−9.341	.069		1.649	−.257	−.032		2.155		.062	−1.595	.537	.675	.814	[4] 27.28
		[4] (5.448)		(.913)	(.338)	[4] (4.182)		[4] (7.362)		[4] (3.729)	[5] (2.132)	[4] (2.539)	[5] (1.873)		
5. 1973	−8.402	.057		.640	−.271	−.015		2.215		.044	−1.800	.585	.694	.773	[4] 21.16
		[4] (4.978)		(.380)	(.368)	[5] (1.717)		[4] (8.633)		[4] (2.524)	[4] (2.603)	[4] (2.970)	[4] (2.670)		
6. 1974	−9.223	.0422		.444	−.644	−.021		2.334		.016	−.781	.248	1.411	.852	[4] 35.66
		[4] (3.887)		(.285)	(.965)	[4] (3.094)		[4] (9.307)		(1.071)	(1.202)	[6] (1.349)	[4] (4.472)		

[1] There are 72 observations from these 50 SMSA's since in several instances more than 1 of the firms operated in an SMSA. 1 observation was deleted from the 1970 sample because of a prolonged labor dispute.

[2] The units in which variables are expressed are summarized in footnote 1, table 2.6. Store size and entry were not used in the division analysis. SS is expressed in million dollars of sales per store. E is expressed in percentages.

[3] Same as footnote 2 in table 2.6.
[4] Significance level equals 1 percent.
[5] Significance level equals 5 percent.
[6] Significance level equals 10 percent.

The Structure-Profit Relationship

The results of the various analyses displayed in Tables 2.6 to 2.8 are generally the same. Most significantly, they confirm the prediction of industrial organization theory that a firm's profits are influenced by the competitive environment in which it operates.[38] The nature of this relationship is illustrated in Table 2.9. This table displays the estimated relationship between pretax profit rates (measured as a percent of sales) and two structural variables, the relative firm market share (RFMS) of a chain in a market and the four leading retailers' share (CR_4) of that market. The estimated relationship is based on equation 1d, Table 2.7. This equation was selected because it reflected more "normal" conditions than those including 1972 and 1973, years when price controls and WEO depressed profits to abnormal levels.[39] Nonetheless, even for the years used in Table 2.9, average profits of chains were low compared to the 1960s.

TABLE 2.9.—ESTIMATED PROFIT-SALES RATIOS FOR VARIOUS LEVELS OF MARKET CONCENTRATION AND RELATIVE FIRM MARKET SHARE, AVERAGE PROFITS FOR 1970, 1971, 1974

[Pre-tax profits as percent of sales]

Relative firm market share (RFMS)	4-firm concentration (CR_4)			
	40	50	60	70
10	0.37	0.99	1.22	1.28
25	1.15	1.77	2.00	2.06
40	1.93	2.55	2.78	2.84
55	2.71	3.33	3.56	3.62

Source: Estimated using equation 1d, table 2.7. All other independent variables are introduced at their means except he binary variable, API, which is introduced at 1.

The estimates in the table measure the extent to which divisional pretax profit rates of chain vary depending on its average relative firm market share (RFMS) and the average four-firm concentration (CR_4) in the markets of the division. For example, if a chain had a RFMS of 10 and operated in a market with a CR_4 of 40, it would have experienced a profit rate of .37 percent of sales. On the other hand, a chain with a RFMS of 55 in a market with a CR_4 of 70 would have enjoyed a profit rate of 3.62 percent of sales. The effect of other combinations of RFMS and CR_4 are illustrated in the table.

This analysis indicates that chains holding dominant market positions in highly concentrated metropolitan areas enjoyed substantial profits even though profits were unusually low during this period. The profits shown in Table 2.9 are expressed as a percentage of sales before taxes. The relevant profit measure in evaluating profits of firms in one industry relative to those in another are profits expressed as a percentage of stockholders' investment. Pretax profits of 3.62 percent of sales (the highest shown in Table 2.9) translates to aftertax profits of over 20 percent of stockholders' investment. This was far above the average profits of all chains during the 1970–74 period, and well above the average of all but the most concentrated American industries.

[38] A dynamic model of structure, conduct and performance in food retailing is developed in Appendix D. This effort is largely exploratory in nature and is empirically tested with only 27 observations. For these reasons, the results may be of interest largely from a methodological standpoint.

[39] The relationships shown in Table 2.9 would be essentially the same, however, if equations for 1970–74 had been used. The only significant difference is the slightly lower profits resulting from the inclusion of 1972 and 1973. Using equation 1c, Table 2.7, the estimated profit rate for a chain with a RFMS of 25 operating in a market with a CR_4 of 40 would be 0.36 percentage points lower than the comparable figure shown in Table 2.9.

Chapter 3. MARKET STRUCTURE-PRICE PERFORMANCE RELATIONSHIPS

The preceding analysis of chain profits indicated that high market shares and concentrated markets tend to be associated with high levels of profit. These results suggest that high profits are due, in part at least, to higher prices. In this section, the realtionship between prices and market structure variables will be examined directly.

The Joint Economic Committee requested each of the 17 chains to supply any price comparison checks that had been conducted during October 1974. There was considerable variability in the quality and quantity of the data supplied in response to this request.

Three large chains, firms D, K, and H, provided quite complete grocery price data for 35 SMSAs in which one or more operated.[1] From these data, 39 observations of the weighted average cost to consumers of a "grocery basket" comprised of 94 comparable grocery products were calculated.[2] It also was possible to compute a more extensive "market basket" of 110 comparable frozen food, dairy, and grocery products for 22 SMSAs.[3] Due to the more limited number of market basket observations, the grocery basket observations were used in the market structure-price relationship analysis in the following section.[4] First, however, we will review briefly the pricing patterns found in the 22 SMSAs for which the more complete market baskets were calculated.

Price Pattern of Two Large Chains

The cost of a market basket of comparable products varied considerably from city to city for the two chains supplying such data. Tables 3.1 and 3.2 summarize the average costs to consumers for vari-

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[1] For purposes of this study, products included within the grocery product category were all products normally sold in a grocery store excluding meat, produce, dairy, frozen foods and health and beauty aid items. For a more detailed description of the product classes included in the grocery product group, see Appendix Table B.2 and B.3.

[2] Of the 39 observations, 25 were for firm H, 10 were for firm K, and 4 were for firm D. Three distinct but similar grocery baskets were constructed for the three companies. Each grocery basket contained the same 94 grocery products; however, the frequency with which private label prices were used in the calculations did vary. For the firm H grocery baskets 46 private labels were included, whereas 57 and 45 private label prices were used in the firm K and firm D grocery baskets, respectively.

[3] Two distinct but very similar market baskets were constructed for two companies. The firm K market basket contained 110 products with 63 products price checked with respect to both national brand and private label, bringing the total number of items to 173. The firm H market basket included the same 110 products plus 17 health and beauty aid products. For firm H, 56 products were price checked for both national and private brands, bringing the total items to 183. Data were not available to estimate "market basket" average prices for firm D. (see Appendix Table B.1).

For a detailed explanation of the methods used in constructing the grocery and market baskets and computing the weighted costs for these baskets, see Appendix B.

[4] The terms "grocery basket cost" and "average grocery prices" are synonymous, in that each refers to the average retail price a consumer paid for the 94 products included in the grocery basket. They are used interchangeably throughout the remainder of the text.

ous product groups and for the combined groups. Information was available for three product groups for firm K and four for firm H. The average cost of the market basket of items in firm K stores ranged from $122.84 in city a to $141.14 in city b, a highly concentrated eastern city. The cost of the market basket in city a was 94 percent of the average for the seven cities studied; the cost in city b was 108 percent of this average.

TABLE 3.1.—FIRM K: MAJOR GROUP AND MARKET BASKET TOTALS WEIGHTED BY NATIONAL BRAND-PRIVATE LABEL AND EXPENDITURE WEIGHTS, 7 SMSAs, OCTOBER 1974

SMSA [1]	Major groups: Frozen food Weighted dollars	Frozen food Rank	Dairy Weighted dollars	Dairy Rank	Grocery Weighted dollars	Grocery Rank	Market basket [2] Weighted dollars	Market basket [2] Rank
City b	15.72	1	25.00	2	100.42	1	141.14	1
City f	14.96	3	25.17	1	97.15	2	137.28	2
City g	15.31	2	23.94	3	95.33	3	134.58	3
City h	14.92	4	23.26	4	91.35	4	129.53	4
City i	14.18	5	21.31	7	91.01	5	126.50	5
City j	14.16	6	22.07	6	88.17	6	124.40	6
City a	13.82	7	22.75	5	86.27	7	122.84	7
Mean	14.72	-------	23.36	-------	92.81	-------	130.90	-------
High market as percent of mean	107	-------	108	-------	108	-------	108	-------
Low market as percent of mean	94	-------	91	-------	93	-------	94	-------

[1] Standard Metropolitan Statistical Area.
[2] Weighted cost of frozen food, dairy, and grocery groups.

Source: Company data provided to the Joint Economic Committee.

TABLE 3.2.—FIRM H: MAJOR GROUPS AND MARKET BASKET TOTALS WEIGHTED BY NATIONAL BRAND-PRIVATE LABEL AND EXPENDITURE WEIGHTS, 15 SMSAs, OCTOBER 1974

SMSAs[1]	Major groups: Frozen food		Dairy		Grocery		Market basket[2]		Health and beauty aids		Market basket with health and beauty aids	
	Weighted dollars	Rank	Weighted dollars	Rank	Weighted dollars	Rank	Weighted dollars	Rank	Weighted dollars	Rank	Weighted dollars	Rank
City e	15.80	2	26.90	2	97.07	1	139.77	1	17.50	2	157.27	1
City k	15.21	11	23.31	3	95.46	2	133.98	6	16.69	3	150.67	5
City l	15.34	9	25.13	9	94.95	3	135.42	4				
City m	15.85	1	25.80	4	94.57	4	136.22	3	15.68	9	151.90	3
City n	15.68	3	27.71	1	94.23	5	137.62	2	17.58	1	155.20	2
City c	14.49	14	25.46	7	93.85	6	133.80	7	15.97	8	149.77	7
City o	15.63	4	25.59	6	93.64	7	134.86	5	16.65	4	151.51	4
City p	15.47	6	25.42	8	92.66	8	133.55	9	16.27	6	149.82	8
City q	15.51	5	25.63	5	92.53	9	133.67	8	16.57	5	150.24	6
City r	14.74	13	24.57	11	92.28	10	131.59	10	15.21	11	146.80	9
City s	15.42	7	23.18	14	92.28	10	130.88	12	14.11	13	144.99	12
City t	14.49	14	24.87	10	92.20	12	131.56	11				
City u	15.42	7	22.37	15	92.20	12	129.99	14	16.15	7	146.14	10
City v	15.25	10	24.24	12	90.63	14	130.12	13	15.13	12	145.25	11
City d	15.13	12	23.30	13	85.97	15	124.40	15	15.38	10	139.78	13
Mean	15.30		24.90		92.97		133.16		16.07		149.18	
High market as percent of mean	104		111		104		105		109		105	
Low market as percent of mean	95		90		92		93		88		94	

[1] Standard Metropolitan Statistical Area.
[2] Weighted cost of frozen food, dairy, and grocery groups.

Source: Company data provided to Joint Economic Committee.

The cost of a comparable market basket in firm H stores ranged from $124.40 in city d to $139.77 in city e, a difference of 12 percent. Although the variation from low to high cities was less for firm H than firm K, this company had an average market basket cost in 15 markets that was 1.7 percent higher than firm K in seven markets. The average cost of the grocery basket for each company differed by less than 1.0 percent.[5]

Structure-Price Relationships for Three Large Chains

Economic theory predicts that prices charged by firms depend in part on the competitive environment in which they operate. Numerous short-run factors, however, may influence the prices of a particular food chain in a particular city in a particular month. As explained earlier, a useful statistical procedure to reduce such random price variability is to average observations for longer periods of time. In the preceding structure-profit analysis is was possible to use annual and five-year average profit data. This was not possible in the analysis of price data. Therefore, an analysis relying on prices in a single month may be expected to yield weaker statistical relationships than if it had been possible to use average prices for a longer time period.

Multiple regression analysis was used to examine the relationships between market structure variables and "grocery basket" costs while controlling for other market characteristics. In addition to the cost observations for two firms in twenty-one SMSAs listed in Tables 3.1 and 3.2, another fifteen observations in which only the grocery basket cost could be calculated were included in the analysis [6] (see Appendix Table B.4).

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[5] The grocery basket for firm K included 57 private label products compared to 46 for firm H, suggesting a greater emphasis on lower priced private labels in the firm K basket. However, due to differences in the private label items included in the two baskets, private label products received 14.2 percent of the grocery basket weights for firm K and 13.6 percent of the weights for firm H. This difference is estimated to bias the grocery basket costs for firm K downward by a fraction of 1.0 percent (0.06 percent).

When only the national brands for the 94 products in the grocery basket were used, the average cost in firm K stores was $94.39 and in firm H stores $93.77.

[6] Three SMSAs, for which the cost of grocery basket were calculated, were dropped from the sample. In the case of city w and city x, the data available to estimate firm market shares and four-firm concentration ratios for 1972 and 1974 were judged highly unreliable. City y was dropped because of reservations about the accuracy of the market structure data and because it was an extreme outlier in the regression analysis (standardized residual of −2.76). When city y was included as an observation in equation 1c, Table 3.3, the results were as follows:

$$NPC = 89.48 + 7.172\ RFMS + 18.774\ CR_1 - .071\ MG - .007SS - .440\ MR$$
$$(2.68)^{**} \quad (5.16)^{**} \quad (-3.18)^{**} \quad (-3.33)^{**} \quad (-4.16)^{**}$$

$$R^2 = .60$$
$$F\ Ratio = 11.74^{**}$$

Without the city y observation, model 1c had somewhat lower regression coefficients on RFMS and CR_4 and the overall significance of the model was increased (See Table 3.3). Analysis of the residuals suggested that the city y observation probably resulted in the partial regression coefficients for RFMS and CR_4 being overstated.

The models and independent variable used in the analysis of pricing performance are similar to those used in examining profits.[7] One independent variable was added to capture the influence on prices of short-run competitive rivalry in particular SMSAs. In many industries, including grocery retailing, firms engage in temporary competitive strategies designed to improve their position vis-a-vis their rivals. In these circumstances, rivalry among chains is more intense than would be expected based upon a given configuration of structural and control variables.[8] When such rivalry is intense it usually is accompanied by lower prices and often leads to changes in the market shares of firms in the market. We therefore have used the 1972–74 changes in the market shares of the four leading firms of 1974 as a proxy of short-run market rivalry (MR). We expect MR to be negatively associated with grocery prices: i.e., the greater the change in the leading firms' market shares (whether up or down) the lower will be grocery store prices in the SMSA affected.[9]

The basic model employed in the regression analysis of grocery prices was:

$$C = B_0 + B_1 RFMS + B_2 CR_4 + B_3 SS + B_4 MG + B_5 MS + B_6 MR$$

$$\text{Hypotheses: } B_1 > 0 \; B_2 > 0 \; B_3 < 0 \; B_4 \neq 0 \; B_5 \neq 0 \; B_6 < 0$$

where:

C = the weighted cost of a grocery basket consisting of either national brand and private label items (NPC), or national brand items only (NC)

RFMS = relative firm market share in 1974. A curvilinear form of this variable (CRFMS) was also employed in some models.

CR_4 = four-firm concentration ratio in 1974. A curvilinear form of this variable (CCR_4) was used in several models.

SS = 1972 mean store size in each SMSA measured in dollars of sales per grocery store.

MG = 1967–1974 percentage growth in SMSA grocery sales

MS = 1974 SMSA size (dollar grocery store sales)

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[7] Price-structure models were specified which included firm growth (FG) as an independent variable. While firm growth was found highly significant in the profit models, price and firm growth were not found to be significantly related. The variable, entry (E), was not specified in a price model due to inapplicability. Market rivalry (MR), which was highly significant in the price models, was not found statistically significant when incorporated in a profit model.

[8] In food retailing, extreme cases of such rivalry result in so-called price wars; although generally quite short-lived, they frequently result in overall price levels below long-run average costs, and below marginal costs for some items.

[9] We emphasize that MR is designed to capture the effect on prices of the intensity of rivalry among leading chains in the short run. This differs from the finding of Haggestad and Rhoades that the intensity of rivalry is negatively related to the level of market concentration. "Concentration and Firm Stability in Commercial Banking," Review of Economics and Statistics (forthcoming). Their study provides an explanation for the general tendency for prices and profits to be positively associated with market concentration, because as rivalry decreases at higher levels of concentration, prices tend to rise above competitive levels. We would expect a similar relationship between concentration and rivalry in the long run in food retailing. Since in this study we are attempting to explain grocery prices at only one point in time, temporary market turbulence, if unaccounted for, can cloud the underlying structure-price relationships. Our market rivalry variable (MR) attempts to explain why, in the short run, prices depart from those we could expect to occur with various levels of market concentration (CR_4).

MR=market rivalry, measured as the absolute change between 1972 and 1974 in the combined market share of the four leading firms of 1974.[10]

Results of the regression analysis are presented in Table 3.3.[11] Two measures of the cost of grocery items were employed as dependent variables: (1) NPC, the cost of a grocery basket comprised of both national brand and private label items (equations 1a-1g); and (2) NC, the cost of a grocery basket comprised of only national brand items (equations 2c and 2g).

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[10] There were two possible ways of calculating the market rivalry values used in the regression analysis. Mathematically these were:

$$(1) \qquad MR_1 = \left| \sum_{l=1}^{4} \Sigma X_{ij} - \Sigma X_{ij-2} \right|$$

$$(2) \qquad MR_2 = \sum_{l=1}^{4} |X_{ij} - X_{ij-2}|$$

where:

X_{lj}=the market share for firm l in year j
l=1, 2, 3, ranked according to greatest market share in 1974.
j=1974, 1973, ...,

Equation (1) was used in calculating market rivalry for purposes of this study. This method yields the aggregate absolute net change from 1972 to 1974 in the combined market shares of the leading four firms in 1974. As used in the regression analysis, MR carries no sign. An increase in the market shares of the four leading firms is assumed to reflect a similar degree of rivalry in the market as a decline in market shares.

Equation (2), while similar, sums the absolute changes in the market share of each of the 1974 leading four firms from 1972 through 1974. While this may be a superior measure of market rivalry, it requires a level of precision on estimates of individual firm market shares beyond the scope of the available data.

[11] Separate regression models were fitted using estimates of relative firm market share and four-firm concentration for 1972 and 1974. The method used for estimating 1974 structural values was similar to that employed in estimating the 1972 observations. For a more detailed explanation see Appendix B. The equations using the 1972 market structure variables appear in Appendix Table B.9. The results are essentially the same as those reported in Table 3.3.

As discussed in Appendix B, 23 of the 36 firm market shares for 1972 were based upon "hard" data provided by the firms; the remaining 13 market shares were estimated using the 1974 edition of the Grocery Distribution Guide, Metro Market Studies. Regression equations were estimated using only the 23 observations for which "hard" data were available. The results for equation 1b, Appendix Table B.9 were as follows:

$$NPC = 90.06 + 6.343\ RFMS + 17.317\ CR_4 - .005\ SS - .141\ MG$$
$$(2.074)^* \quad (3.078)^{**} \quad (-2.132)^* \quad (-3.562)^{**}$$
$$\overline{R}^2 = .49$$
$$F\ Ratio = 6.38^{**}$$

The structure-price relationships found were similar using either the 23 "hard" observations or all 36 observations. For an additional discussion of the method employed in estimating firm market shares, see Appendix B.

Three additional independent variables were considered in the regression analysis. The first, firm market share (FMS) was used as an alternative to relative firm market share (RFMS) as a measure of firm power. Relative firm market share is believed to be superior because of the collinearity between FMS and CR_4. An equation replacing RFMS with FMS resulted in a statistically significant model. Although the R^2 was slightly lower, all the variables were statistically significant at the 5 percent level or higher.

The second and third independent variables were binary variables specified and tested to determine if company differences accounted for some of the variation in the dependent variable. These variables were found not to be statistically significant.

TABLE 3.3.—MULTIPLE REGRESSION EQUATIONS EXPLAINING COST OF A GROCERY BASKET OF 3 CHAINS IN 36 SMSAs, 1974[1]

Equation No.[2]	Intercept	Relative firm market share (RFMS)	Curvilinear relative firm market share (CRFMS)[3]	4-firm concentration (CR_4)	Curvilinear 4-firm concentration (CCR_4)[3]	Average store size (SS)	Market growth (MG)	Market size (MS)	Market rivalry (MR)	$\bar{R}^2$	F Value
1a. NPC	98.18	11.072		8.049		−0.005				0.28	[4] 5.63
		[4] (3.511)		[5] (1.898)		[4] (−2.182)					
1b. NPC	91.05	10.284		11.957		−.007	−0.062			.38	[4] 6.30
		[4] (3.475)		[4] (2.796)		[4] (−3.141)	[5] (−2.405)				
1c. NPC	90.67	6.582		15.645		−.006	−.078		−0.475	.66	[4] 14.87
		[4] (2.882)		[4] (4.864)		[4] (−3.148)	[4] (−4.067)		[4] (−5.247)		
1d. NPC	90.67	6.449		15.259		−.005	−.078	−0.158	−.485	.65	[4] 12.02
		[4] (2.714)		[4] (4.249)		[5] (−1.931)	[4] (−3.975)	(−.259)	(−4.875)		
1e. NPC	89.93	5.025		11.121			−.066	−1.019	−.562	.62	[4] 12.53
		[5] (2.130)		[4] (3.694)			[4] (−3.400)	[5] (−2.333)	[4] (−5.917)		
1f. NPC	96.73	7.112			7.781	−.006	−.075		−.461	.65	[4] 13.77
		[4] (3.048)			[4] (4.565)	[4] (−3.069)	[4] (−3.837)		[4] (−4.981)		
1g. NPC	97.51		3.624		7.416	−.006	−.074		−.458	.66	[4] 14.79
			[4] (3.364)		[4] (4.425)	[4] (−3.169)	[4] (−3.890)		[4] (−5.089)		
2c. NC	90.74	6.604		14.624		−.004	−.069		−.527	.68	[4] 15.83
		[4] (2.929)		[4] (4.607)		[5] (−2.048)	[4] (−3.655)		[4] (−5.898)		
2g. NC	97.20		3.638		6.988	−.004	−.066		−.511	.69	[4] 16.38
			[4] (3.470)		[4] (4.285)	[5] (−2.141)	[4] (−3.522)		[4] (−5.837)		

[1] Thirty-nine observations are shown in figures 3.1 and 3.2 and appendix table B.4. The city w, city x, and city y observations were not included in the analysis due to lack of structural data. In 4 other SMSAs, observations for 2 chains were included; thus 32 different SMSAs were represented in the analysis.

[2] The dependent variable (NPC) in equations 1a–g is the cost of a grocery basket of national brand and private label products. The dependent variable (NC) in equations 2c and 2g is the cost of a grocery basket of only national brand products.

[3] CRFMS and $CCR_4=(x+\alpha)^3/[1-3(x+\alpha)+3(x+\alpha)^2]$, where x equals RFMS or CR_4. Values for each variable were expressed in decimals between 0 and 1. The function of CRFMS and CCR_4 has a positive slope and is symmetric about an inflection point. The inflection point occurs at the point which satisfies the following equation: $I+0.5-\alpha$, where I equals the inflection point. For CRFMS, the inflection point for each of the above equations was 0.35 (i.e. $\alpha=0.15$). For CCR_4, the inflection point for each of the above equations was 0.63 (i.e. $\alpha=-0.13$).

[4] The regression coefficients are statistically significant at the 1-percent level.

[5] The regression coefficients are statistically significant at the 5-percent level.

Note.—Figures in parenthesis are t-values. The statistical significance of the regression coefficients for RFMS, CRFMS, CR_4, CCR_4, SS and MR were tested by means of a 1-tailed t-test; MG and MS were tested by means of a 2-tailed t-test. The adjusted coefficients of multiple determination were tested by means of F-ratio.

Additional independent variables are progressively included in the model as one moves from equation 1a to 1d. The addition of the market rivalry variable in equation 1c nearly doubles the explanatory power of the model and substantially increases the significance of CR_4 and market growth in explaining price variations across SMSAs.

Equations 1f, 1g and 2g include curvilinear forms of CR_4 and/or RFMS. The curvilinear form of four firm concentration (CCR_4) strengthens the significance of RFMS but reduces the significance of four-firm concentration and market rivalry. Comparing models 1f and 1c, including CCR_4 rather than CR_4 tends to weaken the model overall.

Equations 1g and 2g include the curvilinear forms of both four firm concentration (CCR_4) and relative firm market share (CRFMS). Overall, these are similar to the best linear models (1c and 2c). In comparing the c and g models, the main difference is the trade-off in significance of relative firm market share and four firm concentration. Neither model is superior on statistical grounds.

In all but one instance, the independent variables shown in Table 3.3 are statistically significant and have the hypothesized signs. Of particular importance is the consistent positive and significant relationship of the market structure variable (RFMS and CR_4) to grocery prices. These results indicate that, all else the same, the greater a chain's RFMS and the greater the CR_4 of the markets in which it operates, the higher are its grocery prices.

Average store size (SS) has the expected negative influence on prices. As discussed in Chapter 2, this variable was included in the analysis because large chains compete primarily with other supermarkets rather than convenience or small pop-n-mom type stores. This variable provides a partial means of correcting for inaccuracies in the CR_4 values used in the analysis. The latter are computed using universe figures that include small stores as well as supermarkets. Therefore, the negative relationship between SS and prices reinforces the positive relationship between CR_4 and prices.[12]

Market growth (MG) is negatively related to prices in all equations. That is, other variables held constant, chains tended to price lower in rapidly growing markets than in slowly growing markets. This is contrary to the findings of the profit equations in Chapter 2, which found a statistically significant positive relationship between market growth and firm profits.[13] This difference was not unexpected.

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[12] Supermarket concentration ratios were obtained from the Bureau of Census after this report was completed. Replacing the grocery store RFMS and CR_4 with supermarket RFMS and CR_4 had little effect on the regression results. However, average store size (SS) became insignificant in the supermarket models, as expected. Appendix Table B.16 provides a comparison of regression results for 1972 using grocery store. supermarket and Herfindahl measures of market concentration and firm market power.

Caution is warranted in interpreting the average store size variable since it became statistically insignificant when a large western city was temporarily dropped from the sample. Although there was no reason to permanently remove this city from the sample. the sensitivity of SS to one observation suggests that further explorations using SS are needed.

The mean four firm supermarket concentration ratio was .657 compared to .491 for the grocery store CR_4. Mean relative firm market shares were .240 and .235 respectively. These data indicate the degree to which local market concentration is understated when all grocery stores are considered the relevant market.

[13] The results may indicate that operating expenses per dollar of sales decline significantly in growing markets. Chains may pass at least part of this saving through lower prices in order to maintain or enhance their market share and yet still realize higher profits per dollar of sales.

The variable market size (MS) was included in two of the equations. Because of the collinearity between average store size and market size (r=.60), the relationship of these variables to grocery prices is muted when both variables are included in the model (e.g., equation 1d). When average store size is excluded in equation 1e, market size has a significant negative relationship to grocery prices.

The market rivalry variable (MR) has the predicted negative sign and is highly significant in all equations in which it was included. This means that when other variables are held constant, prices are lowest in markets where firm rivalry is most intense, as measured by changes in the market share of the four leading firms of 1974. The variable also increases the statistical significance of CR_4 and MG. The significance of RFMS declines somewhat but remains highly significant.

Equations 2c and 2g include the same independent variables as equations 1c and 1g but use as the dependent variable a market basket consisting solely of national brand products (NC). Use of the national brand grocery basket does not change the results significantly. These results show that the inclusion of private label products in the grocery basket had little effect on the statistical findings and did not introduce a bias into the results.

The c and g models explain two-thirds of the variation in grocery basket costs in the sample SMSAs. Given the nature of the task undertaken and the data available, the regression results should be viewed with considerable confidence.

Limitations of Regression Results

We emphasize that the estimates and interpretations of the preceding regression analyses are necessarily influenced by the nature and quality of the data used in making them. One possible source of error is that the price comparison data were available for only one month. We have no reason to believe this biases the results upward or downward. This could tend to lower the level of statistical significance of the analysis because short term random factors cannot be reduced by the averaging process possible when information is available for longer periods. Therefore. the reported results may well understate the level of statistical significance of our findings.

Another possible source of error is that the regression analysis was based solely on a market basket of grocery products. However, prices for items in this product grouping were closely correlated with prices for a market basket including additional product groupings.

A third possible source of error is that the items checked were considered by the sample chains to be the most price sensitive or "competitive" and therefore were not representative of nonchecked items. However, there is no *a priori* reason for believing that if a firm could elevate prices for the checked items in noncompetitive markets that it could not likewise raise other prices as well.

Finally, we urge caution in over-generalizing from these results because they are based upon the pricing behavior of only three chains in 32 different SMSAs. The firms and metropolitan areas included in the analysis were selected because of data availability, not because of their representativesness. However, we also have no reason to suspect that either the firms or the market are atypical. Within the ranks of the

20 largest chains, the three firms included in our analysis represent a reasonable cross section in terms of profitability, growth and average firm market share. The 32 SMSAs in the price analysis had a weighted mean CR_4 of 48.8 for 1972; this compares to 49.6 for the 263 SMSAs included in the 1972 Census.[14] Thus, while caution is warranted in interpreting the results, we have no grounds for believing that our results are atypical for food retailing.

Estimated Structure-Price Relations

Despite the qualifications made above, the findings of the regression analysis lend additional support to the structure-profit relationships identified in Chapter 2. The structure-price relationships strongly suggest that the higher observed profits are due, at least in part, to the higher prices chains are able to charge in less competitively structured markets.

Table 2.9 presented the profits estimated by the regression model for various combinations of RFMS and CR_4 when all other variables are held constant. Table 3.4 is a similar table with the costs of grocery baskets predicted by equation lg, Table 3.3. The figures in parentheses represent the percentage change in grocery basket cost from the upper left cell with a RFMS of 10 percent and CR_4 of 40 percent.

TABLE 3.4.—ESTIMATED COSTS OF GROCERY BASKETS FOR DIFFERENT COMBINATIONS OF RELATIVE MARKET SHARE AND 4-FIRM CONCENTRATION, OCTOBER 1974 [1]

Relative firm market share	4-firm concentration ratio							
	40		50		60		70	
	Cost	Percentage change	Cost	Percentage change	Cost	Percentage change	Cost	Percentage change
10	$90.95	0	$91.84	1.0	$93.64	3.0	$95.78	5.3
25	91.65	.8	92.54	1.8	94.34	3.7	96.48	6.1
40	93.16	2.4	94.05	3.4	95.85	5.4	97.99	7.7
55	94.18	3.6	95.07	4.5	96.87	6.5	99.01	8.9

[1] The cost of a grocery basket at various levels of RFMS and CR_4 was estimated using equation 1g, table 3.3, when all other variables were introduced at their mean values. Percentage changes were calculated from the base of $90.95.

These estimates indicate that firm grocery store prices rise significantly as four-firm concentration (CR_4) increases.[15] A chain with a relative firm market share (RFMS) of 10 operating in a market with a CR_4 of 70 would have estimated prices 5.3 percent higher than a chain with a RFMS of 10 in a market with a CR_4 of 40. Similarly, a chain's prices rise as its RFMS rises. The chain with a RFMS of 55 in a market with a CR_4 of 40 would have estimated prices 3.6 percent higher than a chain in the same market with a RFMS of 10.

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[14] The unweighted mean CR_4 for the 32 sample SMSAs in 1972 was 49.1 compared to 53.3 for all 263 SMSAs, indicating a somewhat larger proportion of small SMSAs with high CR_4s in the latter group.

[15] Some attempts have been made to relate the Bureau of Labor Statistics data on food prices in different SMSAs to the market structure of these SMSAs. A paper presented at the 1976 American Agricultural Economics Association annual meeting, "Analysis of the Impact of Market Characteristics on City Food Prices," by G. Grinnell, T. Crawford and G. Feaster regressed BLS food price data on several independent variables, including local market concentration ratios. The only variable that was statistically significant in all their models was the distance of the city from Manhatten, Kansas, the geographic center of agricultural production in the U.S. This variable was used as a proxy for transportation costs in the Grinnell et al. models. This variable was added to the models employed in the present study but was not statistically significant and had little effect on the regression results.

The BLS data are not designed for comparisons across markets, have serious limitations when used for this purpose, and therefore cannot be used to either confirm or refute the findings of the present study. For a fuller discussion of the BLS food price data, see Appendix C.

Prices would be highest, of course, for the chain that had a high RFMS and operated in a market with a very high CR_4. The chain with a RFMS of 55 in a market with a CR_4 of 70 would have estimated prices 8.9 percent higher than the chain with a RFMS of 10 in a market with a CR_4 of 40.

The wide differences in estimated prices suggest that profits would also vary substantially among markets. The interrelationship between high prices and profits is discussed in the following chapter.

Pricing of National Brand and Private Label Products

The higher grocery prices in more concentrated markets revealed by the preceding analysis may be due to higher prices on national brand grocery products, private label products, or both. In this section, the pricing patterns on national brand and private label products will be examined to compare the pricing strategies employed by the three chains across markets and to determine how national brand-private label pricing has changed over time.

The National Commission on Food Marketing stimulated interest in the pricing of comparable national (or advertised) brands and private label (or store brand) products. Based upon a sample of ten products, the Commission reported that on average, advertised brands were priced 21.5 percent higher than private label items.[16]

In the present study, it was possible to compare the national brand and private label prices on a large number of products (46 products for firm H, 57 for firm K and 45 for firm D).[17] Prices were compared by calculating the cost of three grocery baskets. First, the cost of the grocery products were calculated assuming that only national brands items were purchased. The second calculation assumed the reverse—that only private label items were purchased. Finally, the "effective" cost was calculated using national brand-private label weights.[18]

The resulting cost of grocery baskets showed that for firm K, the prices for private label items were, on the average of 86.7 percent of the prices for national brand items. For firm H, private label prices averaged 92.4 percent of national brand prices. For firm D, private label prices averaged 88.9 percent of national brand prices (see Appendix Tables B.4, B.5, and B.6). The simple average of private label-national brand ratios in the three companies was 89.3 percent. Expressed differently, national brand prices, on average, were about 12.0 percent higher than private label prices (the change in base results in a higher percentage spread).[19]

Differences in the prices of national and private brands were also computed for the same 10 products examined by the National Commission on Food Marketing. National brand prices averaged 9.9 percent higher than private label prices for the 10 products—less than half the price spread found in the mid 60's. A recently published study conducted at Cornell University found a less severe decline in national brand-private label price differences. For 10 products (nine were the

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[16] National Commission on Food Marketing, Special Studies in Food Marketing, Technical Study No. 10, U.S. Government Printing Office, June 1966.

[17] National brand and private label items were matched. I.e., for firm H, 46 national brand grocery items were priced along with 46 comparable private label items; for firm K, 57 national brand items were matched with 57 private label items.

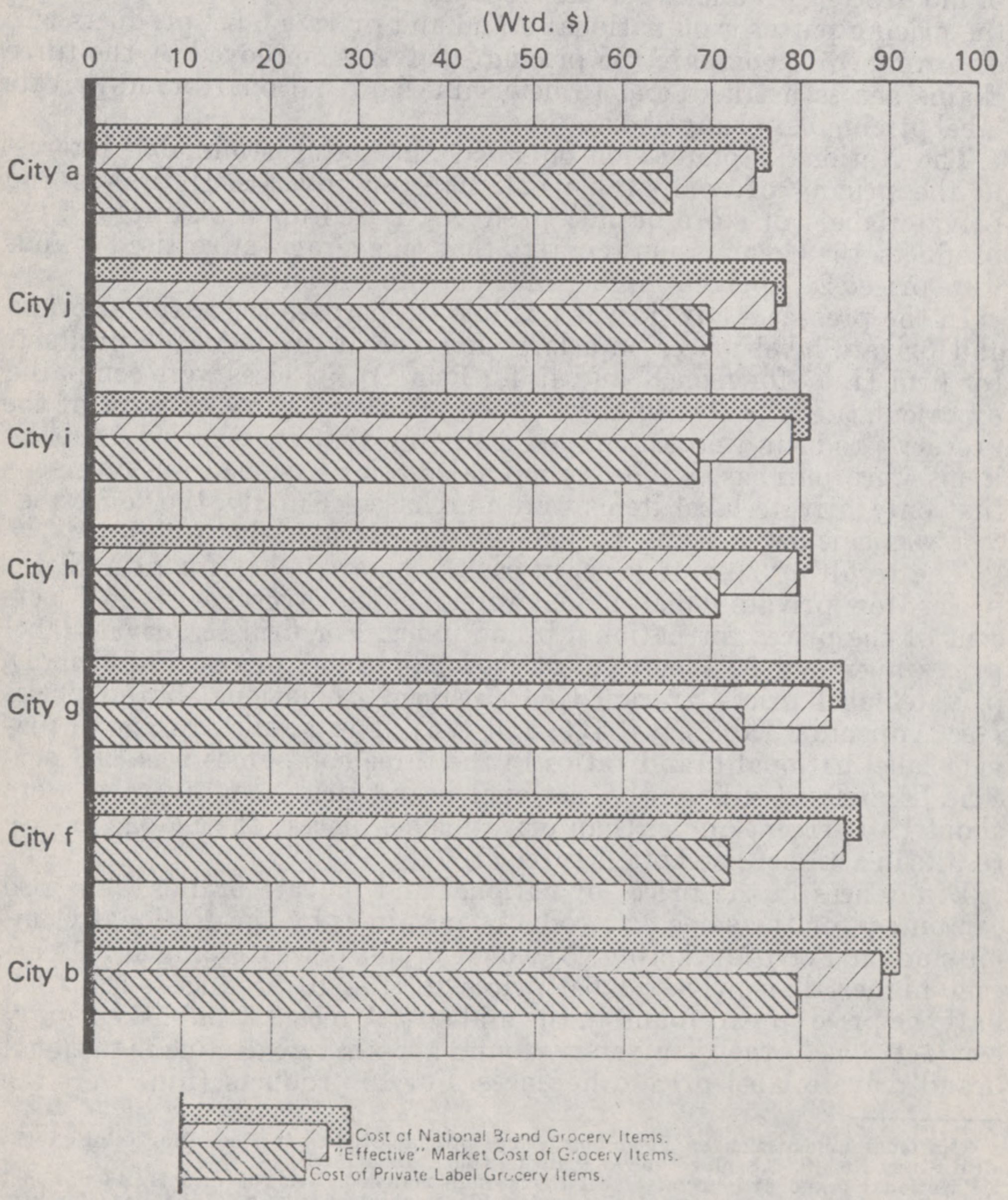
[18] National brand-private label weights were simply estimates of the proportion of each product sold as national brands and the proportion sold as private brands.

[19] Firm K, firm H and firm D national brand-private label average price ratios were 115.3, 108.2 and 112.5, respectively. The calculated simple average was 112.0 percent.

same used in NCFM study), national brands averaged 13.0 percent higher in price than private label products.[20]

The spread between national brand-private label prices across markets are shown graphically in Figures 3.1 and 3.2. Markets are ordered from left to right according to the cost of the national brand grocery basket. In going from low to high cost markets, national brand prices increased at a more rapid rate than private label prices; both the absolute and percentage price spread between national and private brands tended to widen.

Figure 3.1. Firm K Cost of Grocery Items: National Brand, Private Label, "Effective" Cost.

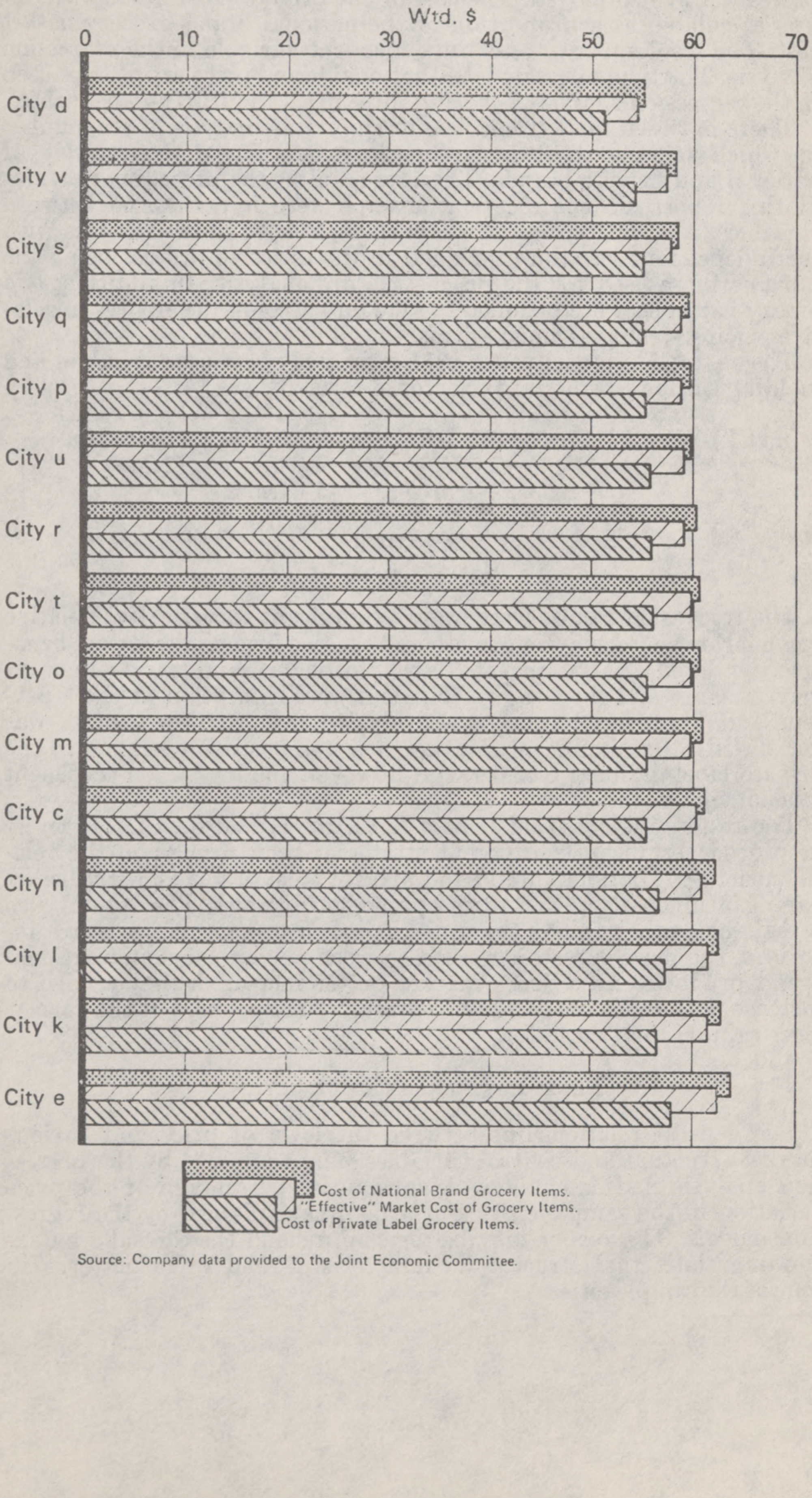


Source: Company data provided to the Joint Economic Committee.

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[20] Cooperative Extension, New York City Programs, Focus on the Food Markets, Nov. 17, 1975.

Figure 3.2. Firm H Cost of Grocery Items: National Brand, Private Label, "Effective" Cost.



Source: Company data provided to the Joint Economic Committee.

To determine whether market structure factors influenced the price relationship of national brand and private label products, multiple regression was employed. The cost of the private label grocery basket was calculated as a proportion of the national brand grocery basket cost. The resultant ratio was the dependent variable in the regression analysis. Thirty-six private label-national brand price ratios were used in the regression analysis, covering three firms and thirty-two markets.

There has been little theoretical or empirical analysis of the manner in which market structure influences the relative price levels of national and private brands. Therefore, unlike the preceding portions of this report, no specific relationships were hypothesized between variables. A stepwise regression routine was used in the analysis with the independent variables included in the selective process being the same as those used for the price-structure analysis. In addition, two binary variables were included to take into account differences in relative pricing strategies among firms.

The regression model using 1974 estimates of structural values and yielding the lowest standard of error of estimate was:

$$\begin{gathered} PL/NB = .93417 - .04487\ RFMS - .00017\ MG + .00418\ MS \\ (-2.678)^{*} \qquad (-1.280) \qquad (1.245) \\ -.05554\ Firm\ 1 - .03945\ Firm\ 2 \\ (-10.553)^{**} \qquad (-5.568)^{**} \\ R^2 = .81\ F \\ Ratio = 30.32^{**} \end{gathered}$$

The regression results were highly significant statistically. Relative firm market share, market growth and the two firm binaries were negatively related to the private label-national brand ratio. Relative market share and the two firm binaries were significant at the 5 percent and 1 percent level, respectively, whereas market growth was not statistically significant. Market size was positively related to the private label-national brand ratio; however, the regression coefficient was not significant.

The results indicate that if firm K (Firm 1) and firm D (Firm 2) employed significantly different strategies than firm H in the relative pricing of national brand and private label products, with firm H having a much narrower price spread on average. The results also reveal that, other things the same, as relative firm market share increased, the price spread increased between private label and national brand products. As a firm's market power increased, they tended to increase both national brand and private label prices, but the former more rapidly than the latter.

Price Patterns in Four Cities

The general relationships between the level of price and various market structure and control variables were examined by the regression analysis in this chapter. A substantial percentage of the price variation in the sample cities and firms was explained by the regression models. The reader may better comprehend these results by examining the actual structural characteristics and price patterns in four of the sample cities.

This discussion of individual markets necessarily differs from the preceding regression analysis where the emphasis was on explaining price variations across markets through the use of control variables such as average store size, market growth, and market rivalry. In the discussion that follows, price patterns within as well as across cities will be examined and related to the two critical market structure variables—four-firm concentration and relative firm market share. What follows, then, is not an attempt to explain all the forces found to influence prices, but rather four illustrations of the impact of CR_4 and RFMS.

A few comments are warranted concerning the price patterns within a particular market. The regression analysis examined prices across markets; the strong positive relationship found between RFMS and the grocery prices of the three chains was consistent with the theory that dominant firms have pricing discretion in addition to that resulting from the level of market concentration.

In examining the prices of different firms within the same market, an additional factor must be considered. Retail firms attempt to differentiate themselves by providing some unique combination of products, service, location, facilities and prices. For a particular chain, their "product-service mix" is generally similar from one city to another. Hence, in analyzing a particular firm's price across markets, this factor can be ignored. However, for different firms in the same market, one cannot assume that product-service mixes are similar; rather it is expected that a variety of mixes with different costs and different consumer appeals will exist.[21]

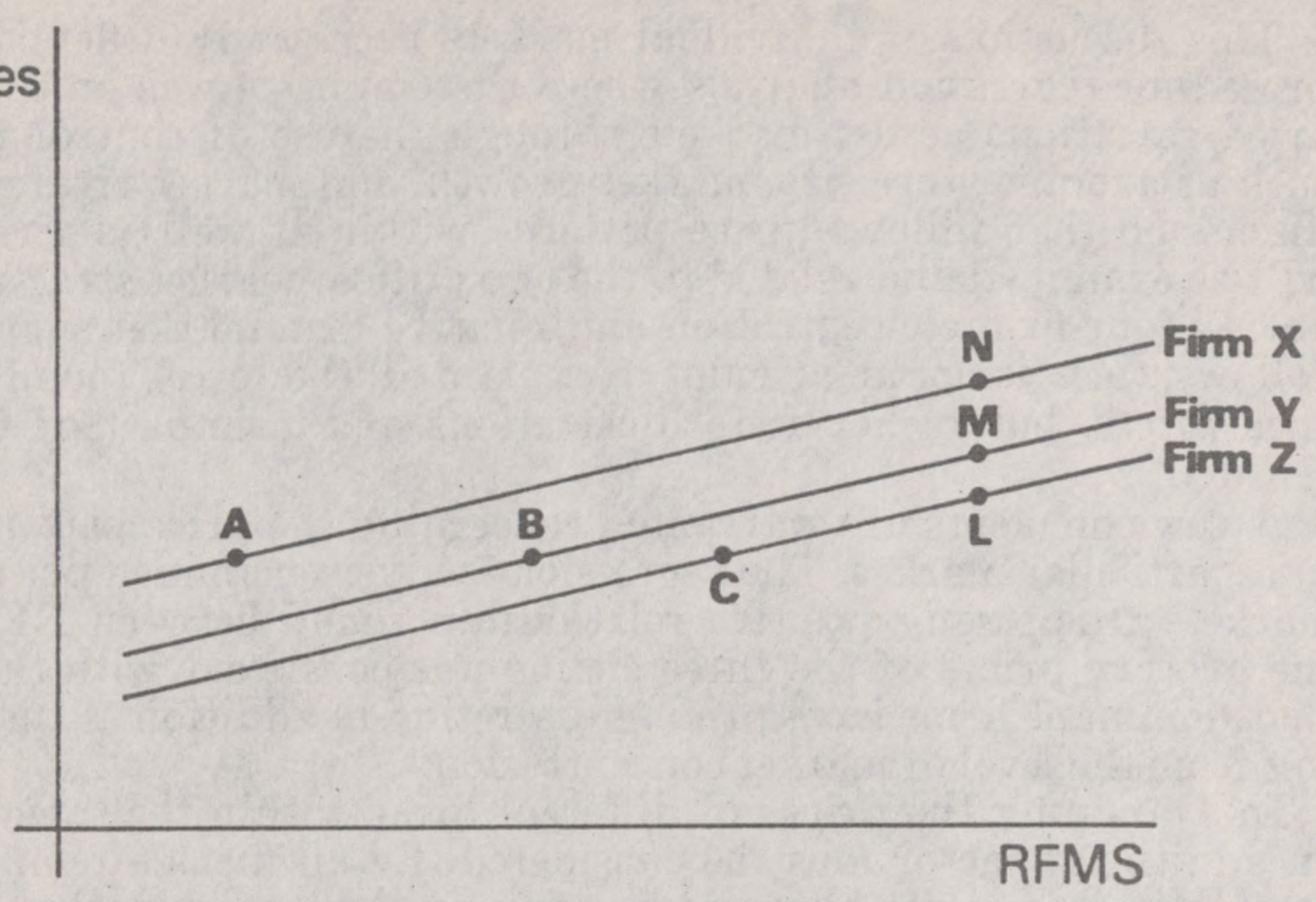
The combined influence of RFMS and product-service mixes is illustrated in the figure below. Firms X, Y and Z are each assumed to operate across several markets. For each firm, a positive relationship between prices and RFMS is assumed across different markets. The three firms are also assumed to have different product-service mixes as reflected in the different levels of their price lines.

Given this assumed situation, the prices of the three firms would be N, M and L in a market where all three had equal RFMS. In yet another situation (A, B and C), their prices would be equal but each firm would have a different RFMS. Finally, consider the combination of A, B and L in which the highest priced firm would be Firm Z because of a dominant market share. Thus, in those markets where RFMS and different product-service mixes both influence prices, a myriad of price combinations is possible. And while we would expect to observe a general positive relationship between RFMS and prices within individual markets if a large number of markets are examined, such a relationship may not exist in any particular market.

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[21] Possible differences in the product-service mixes of different firms must also be considered in examining the structure-price relationship for several firms operating in multiple markets. Such differences could lead to spurious results, particularly if the analysis includes a large number of firms, each of which operates in a small number of markets. In the present study, only three firms were included in the structure-price analysis with an average of 12 observations per firm.

To test for company differences in prices attributable to factors other than those specified in the models, (e.g., company differences in product service mix) firm binary variables were specified and included in the regression analysis. These variables were not statistically significant.



PRICES IN CITY B, A HIGHLY CONCENTRATED EASTERN CITY

City b is one of the most concentrated food retail markets of all SMSAs with population exceeding 500,000. The largest four chains in that city controlled about 76 percent of sales in 1974 (Table 3.5),[22] and the combined market share of the two dominant firms in 1974 was estimated at 62.3 percent.[23]

The average four-firm concentration in 1974 for all the sample SMSAs was 51.0 percent, or 24.5 percentage points below the concentration level in city b. The two dominant firms each held over 30 percent of the market, which gave them relative market shares of just over 40 percent, considerably greater than the sample average of 24.0 percent. The third and fourth largest firms each had about equal relative market shares, considerably below the leading two firms and the sample mean.

TABLE 3.5.—AVERAGE COST INDEXES FOR MEAT AND MARKET BASKET ITEMS SOLD BY 5 FIRMS IN CITY B, OCTOBER 1974[1]

Company	1974 market share[2]	Grocery basket	Market basket[3]	Meat basket	Market and meat basket
E	31.8	102.4	102.2	103.4	102.5
K	30.5	102.3	102.0	100.0	101.5
A	6.8	100.0	100.2	100.5	100.3
F	6.4	99.7	99.3	102.8	100.2
I	1.4	95.5	96.3	93.3	95.5

[1] See appendix B. Indices were derived by expressing the estimated market basket costs as a percent of the mean values.
[2] The 1974 market shares are the average market share for each firm from the 1975 and 1976 issues of "Grocery Distribution Guide," Metro Market Studies, Inc., adjusted proportionally to equal the 1974 concentration ratio. The latter was estimated from the 1972 census concentration ratio, hard data, and metro market. See appendix B.
[3] This market basket contained frozen food, dairy, and grocery products.

[22] The market share data shown in Table 3.5 are estimates derived from market shares reported in Grocery Distribution Guide. These data are quite close to the data used in the regression analysis, which is not reported here to avoid disclosure. The concentration ratio for the top four chains in 1972 was 76.3.

[23] It should be noted that firm market shares shown in Tables 3.5–3.8 were not necessarily those used in the regression analysis, whereas the four-firm concentration ratios were.

Given the high level of concentration and the dominance of two firms, our regression results suggest that average grocery prices in city b would be well above the average prices in other cities. Also, given the pattern of market shares, specifically the dominant positions of firm E and firm K, we would expect these chains' prices to be higher than those holding small market shares.

The facts are consistent with these expectations. The relative cost of the grocery, market, and meat baskets for five chains in city b are shown in Table 3.5. The range in prices for the five chains was up to 10 percent with firm E consistently the highest and firm I the lowest. The two dominant chains had essentially identical prices for a grocery basket as well as for a broader market basket that included grocery, dairy, and frozen food products. With the addition of the meat basket, firm E clearly had the highest overall prices (1.0 percent greater than firm K). Firm A and firm F, the 3rd and 4th ranked firms in the market, had similar prices, but were about 2 percent lower than the market leader. Prices of firm I, which operated discount stores, were well below all other chains.

The observed data for city b conform quite well with the theoretical expectations. Chains with relatively high market shares are expected to charge higher prices than those with lesser market positions. But in addition, the average cost of the grocery basket in firm K's city b stores in October, 1974, was the highest across the thirty-six observations used in the regression analysis, and was 7.8 percent greater than the sample mean. Whereas firm F, the fourth ranked firm, had average grocery prices in city b that were 2.6 percent lower than firm K, its prices were still 5.2 percent above the sample average. Thus, not only did those chains with dominant market positions enjoy relatively higher prices than their smaller rivals, but the high level of market concentration raised the overall level of prices in the city. The weighted average grocery basket price for the five firms examined was 7.2 percent greater than the sample mean.

The high and nearly identical market basket costs of the two dominant firms suggest that little, if any, price competition existed between these two firms. This view is supported by a comparison of the actual prices used in tabulating the market basket indices. These showed that these firms had identical prices on 66 percent of the items. Furthermore, an analysis conducted by the staff of the Joint Economic Committee revealed that of the 460 price changes made by firm K during October 1974, 346 or 75.2 percent resulted in identical prices for the two firms. These findings support the expectation that little price rivalry occurs in highly concentrated markets, particularly among the dominant firms. The absence of keen rivalry in the market conduct of competitors explains why highly concentrated markets tend to have higher prices and profits than less concentrated ones.[24]

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[24] Industrial organizations theory posits that market structure determines market conduct which in turn determines performance. Joe S. Bain, Industrial Organization, 1958. Because it is difficult to measure market conduct, the connecting link between structure and performance, most empirical studies estimated directly the relationship between market structure and price or profit performance. This is a methodology followed in this report, although it includes some variables designed to capture the effects of differences in short-run conduct.

Prices in City C, Midwestern City

City c is an example of a moderately concentrated market. In 1974, the top four firms made about 47.7 percent of grocery store sales in the SMSA, or 3.3 percent below the sample mean. The leading firm, (firm T), had a market share of 15.8 followed closely by firm H with 14.1 percent and firm J with 10.9 percent. This pattern was in market contrast with city b, where the top two firms, alone, did over 60 percent of the business and each was over four times larger than the third and fourth ranking firms.

The differences in the city c and city b market structures suggest that prices are set in significantly different competitive settings in the two cities. City c has neither the concentration nor dominant firm characteristics of city b. Given the more competitive market structure in city c, we would expect the prices of the leading firm and the average market price to be much closer to the sample average than in city b.

The actual costs of market baskets in city c are summarized in Table 3.6. No systematic relationship existed between firm prices and market share in city c. The third largest firm, had the highest average cost of grocery and/or market baskets. Firm H had the lowest average market basket costs, 2.6 percent lower than firm J. Firm T, a local chain with the leading market share, had prices that were higher than firm H but lower than firm J and firm A. Moreover, the average level of prices in city c did not differ much from the sample mean. Firm H's grocery prices were only 0.7 percent greater than the average grocery basket price found across all sample cities. The weighted grocery basket price computed for all five firms for which data were available averaged only 1.8 percent above the sample mean. Thus, both the level and distribution of prices in city c were generally consistent with its market structure.

TABLE 3.6.—AVERAGE COST INDEXES FOR MEAT AND MARKET BASKET ITEMS SOLD BY CHAINS IN CITY C, OCTOBER 1974 [1]

Company	1974 market share [2]	Grocery basket	Market basket [3]	Meat basket	Market and meat basket
T	15.8	99.6	99.6	99.7	99.7
H	14.1	98.9	98.7	96.1	98.2
J	10.9	101.4	101.3	102.5	101.7
A	6.9	100.9	100.5	101.1	100.7
S	2.4	99.1	99.3	100.3	99.6

[1] See appendix B. Indices were derived by expressing the estimated market basket costs as a percent of the mean value.
[2] The 1974 market shares are the average market share for each firm from the 1975 and 1976 issues of "Grocery Distribution Guide," Metro Market Studies, Inc., adjusted proportionally to equal the 1974 concentration ratio. The latter was estimated from the 1972 census concentration ratio, hard data, and metro market. See appendix B.
[3] Included grocery, dairy, frozen food, and health and beauty aid products for all firms except firm S, in which case health and beauty aid products were not included.

Prices in City F, a Western City

Food retailing in city f was moderately concentrated in 1974 with the top four firms making about 49.3 percent of sales. Firm K held a dominant market share of 26 percent, and a relative market share of 53 percent. Firm B, the second largest firm, had only 9 percent of the market, less than half the share held by firm K (see Table 3.7).

While the moderate level of concentration would not lead to an expectation of above average prices, firm K's dominate market position would be expected to result in firm K charging significantly higher prices than its competitors, thereby raising the average price level of the market. Thus, in the city f market we would expect average grocery prices to exceed the average price across all markets.

These expectations are generally supported by the observed prices. Firm K's grocery basket price in city f was 4.5 percent above the sample mean, although it was 3.3 percent below its prices in city b. The relative grocery basket price for the four firms for which data were available was 3.8 percent higher than the sample average. The relative price pattern conforms to the expected ranking of chain prices, but the distinctions are not as great as expected based solely on the relative market share variable in the regression model. Firm K's market basket prices were 0.9 percent above second place firm B's and averaged about 2 percent above the fourth and fifth largest firms (Table 3.7).

TABLE 3.7.—AVERAGE COST INDEXES FOR MEAT AND MARKET BASKET ITEMS SOLD BY 4 CHAINS IN CITY F, OCTOBER 1974[1]

Company	1974 market share [2]	Grocery basket	Market basket [3]	Meat basket	Market and meat basket
K	25.9	100.9	101.4	99.9	101.1
B	9.0	100.8	100.5	101.2	100.7
U	8.0	----	----	----	----
I	6.3	98.6	98.3	98.7	98.4
V	5.1	99.7	99.8	100.2	99.9

[1] See appendix B. Indices were derived by expressing the estimated market basket costs as a percent of the mean values.
[2] The 1974 market shares are the average market share for each firm from the 1975 and 1976 issues of "Grocery Distribution Guide," Metro Market Studies, Inc., adjusted proportionally to equal the 1974 concentration ration. The latter was estimated from the 1972 Census concentration ratio, hard data, and metro market. See appendix B.
[3] This market basket contained frozen food, dairy, and grocery products.

Although city f is much less concentrated than city b, both markets are clearly dominated by one or two companies. In a general sense, the results were quite similar. In both markets, the dominant firm(s) charged the highest prices and contributed to above average prices for the market areas.

Prices in City Z, a Southern City

City z was a relatively concentrated market in 1974, with a four-firm concentration ratio of 61.3. Major chains comprised the leading four firms in the city, with firm N holding the leading position. Firm A and firm W followed and held identical market shares. Firm H was a distant fourth, with a market share of 6.2 percent and a relative market share of 9.8 percent. This was 14.0 percentage points lower than the sample average. Given the high level of concentration and distribution of market shares, we would expect higher than average grocery prices with the leading firm having the highest prices.

The average cost of a grocery basket in city z, based on the grocery basket index and market shares shown in Table 3.8, was 3.1 percent greater than the sample mean. This is consistent with the expectation that average prices are higher in markets with relatively high levels of market concentration.

Based on the relative dominant position of firm N in the market, we would expect it to be the highest priced chain. In fact, however, second place firm A's prices were highest, 1.5 percent above those of firm N. Firm N's prices were higher than those of the other leading chains. Comparison of firm H's cost of a grocery basket in city z wi the average cost of a grocery basket across all markets in the sample shows that firm H's prices were 1.1 percent higher than the mean.

The general level of prices in city z was consistent with expectations. Except for firm A, the ranking of chain prices was also as expected.

TABLE 3.8.—AVERAGE COST INDEXES FOR MARKET BASKET ITEMS SOLD BY 4 CHAINS IN CITY Z, OCTOBER 1974 [1]

Company	1974 market share [2]	Grocery basket	Market basket [3]
N	24.5	100.7	100.7
A	15.3	102.3	102.8
W	15.3	98.5	98.5
H	6.2	98.4	98.0

[1] See appendix B. Indices were derived by expressing the estimated costs as a percent of the mean values.
[2] The 1974 market shares are the average market share for each firm from the 1975 and 17976 issues of "Grocery Distribution Guide," Metro Market Studies, Inc., adjusted proportionally to equal the 1974 concentration ratio. The latter was estimated from the 1972 census concentration ratio, hard data, and metro market. See appendix B.
[3] This market basket contained frozen food, dairy, grocery, and health and beauty aid products.

In these four illustrative markets, the positive influence of CR_4 and RFMS on prices is generally apparent, particularly where one or more firms dominate a market. Where market shares are relatively equally distributed and concentration is moderate, as in city c, both the average level and pattern of prices reflect a more competitive market situation. Thus, although the regression models are not expected to explain the prices in any particular market, the basic structure-price relationships indicated by these models are apparent in these four selected markets.

Chapter 4. IMPLICATIONS OF PROFIT AND PRICE REGRESSION RESULTS

The structure-price findings in Chapter 3 lend considerable support to the structure-profit relationships discussed in Chapter 2. The structure-price relationships strongly suggest that the higher observed profits are due at least in part to the higher prices chains are able to charge in less competitively structured markets.

Unfortunately, the data series did not permit a direct comparison of price and profit levels across SMSAs. There was little overlap in the SMSAs or the companies involved in the two data sets. It may be informative, however, to compare the results indicated by the profit and price models for markets with certain structural characteristics. Table 4.1 combines Tables 2.9 and 3.4 to indicate the relative prices and profits predicted by the regression models for various combinations of relative firm market share (RFMS) and four-firm concentration (CR_4) when all other variables are held constant.

This table indicates that firm grocery prices would be expected to be 8.9 percent higher in a market situation where RFMS is 55 and CR_4 is 70 than in one where RFMS is 10 and CR_4 is 40. If the operating expenses per dollar of merchandise were similar in these two market situations, the difference in profit-sales ratios would be expected to be similar to the percentage difference in prices.[1] However, Table 4.1 indicates expected profit/sales of 0.37 and 3.62 in these two situations, an increase of 3.25 percentage points. Thus, it appears that higher prices are only partially reflected in higher profits. In the above comparison, higher profits account for about 37 percent of the

TABLE 4.1.—ESTIMATED INDEX OF GROCERY PRICES AND PRETAX PROFIT-TO-SALES RATIOS ASSOCIATED WITH VARIOUS LEVELS OF MARKET CONCENTRATION AND RELATIVE FIRM MARKET SHARE

Relative firm market share (RFMS)	4-firm concentration ratio (CR_4)							
	40		50		60		70	
	Index of grocery prices	Profits as percent of sales [2]	Index of grocery prices	Profits as percent of sales	Index of grocery prices	Profits as percent of sales	Index of grocery prices	Profits as percent of sales
10	100.0	0.37	101.0	0.99	103.0	1.22	105.3	1.28
25	100.8	1.15	101.8	1.77	103.7	2.00	106.1	2.06
40	102.4	1.93	103.4	2.55	105.4	2.78	107.7	2.84
55	103.6	2.71	104.5	3.33	106.5	3.56	108.9	3.62

[1] The estimated grocery basket cost for each combination of RFMS and CR_4 was calculated using equation 1g, table 3.3 and holding other independent variables at their respective means. The index was constructed by setting the grocery basket computed for RFMS=10, CR_4=40 equal to 100.

[2] Profits as a percent of sales were estimated for each combination of RFMS and CR_4 using equation 1d, table 2.7 introducing all other variables except API at their means; the binary variable API was introduced with a value of 1. Equation 1d was developed using the average division profit levels for the 3 years 1970, 1971, and 1974. The grocery price models were based upon 1974 prices.

[1] Analysis of the demand for food indicates that a 10 percent rise in the price of food, all else the same, will result in a reduction in the quantity of food purchased of about 3.5 percent and an increase in dollar sales of 6.15 percent. However, in comparing two metropolitan areas with considerably different market structures and prices, it is reasonable to assume market power and higher price levels evolve gradually over time. If so, then market capacity would be expected to be regulated to conform to the restricted output resulting from higher prices. With similar levels of efficiency, average costs per unit of output would then be similar in different markets whereas average revenue per unit of output would vary directly with price levels.

difference in prices. This suggests that increases in expenses absorb the remaining 63 percent.

Put another way, the results of the price and profit models suggest that increases in profits stem entirely from increases in prices. Operating expenses, instead of declining as a percent of sales as market share increases, appear to move in the opposite direction. These results provide no support for the notion that higher profit divisions and SMSAs largely reflect lower operating costs.[2]

Economists have long recognized that market power tends not only to result in excess profits but in higher costs as well. Prices in monopoly markets tend to be greater not only due to larger cost-price margins, but due to higher costs as well.[3] This expectation is supported by empirical studies that show per unit costs tend to rise when profits are high.[4] In his famous article dealing with this phenomenon called "X-inefficiency", Professor Liebenstein said, "We have instances where competitive pressures from other firms or adversity lead to efforts toward cost reduction, and the absence of such pressures tends to cause costs to rise".[5]

Another possible reason that prices between two markets differ by more than the profit-to-sales ratios is the ability of multiple division chains to allocate costs among divisions in such fashion that high profit divisions carry a disproportionately high burden of corporate overhead. This, of course, would result in cross-subsidization of low profit-competitive divisions by high profit-monopolistic ones.[6]

For the above reasons, relatively high observed profits are merely the tip of the monopoly-power iceberg. An example from the food

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[2] A recent study of food retailing in Canada provides modest additional evidence. Although the methodology used is subject to question, the study found that both net operating profits and price levels were positively related to the level of concentration in various metropolitan areas. Using relative weak statistical tests, no correlation was found between four-firm concentration and operating expenses. Bruce Mallen, "A Preliminary Paper on the Levels, Causes and Effects of Economic Concentration in the Canadian Retail Food Trade: A Study of Supermarket Market Power," Reference Paper No. 6, Concordia University, Montreal, February 1976.

[3] F. M. Scherer, Industrial Market Structure and Economic Performance, Rand McNally, 1971, pp. 405–09.

[4] R. M. Cyert and J. G. March, A Behavioral Theory of the Firm, Prentice-Hall, 1963, p. 37.

[5] H. Leibenstein, "Allocative Efficiency vs. 'X-Efficiency'," American Economic Review, June 1966, pp. 309–10.

[6] Professor Ray A. Goldberg, Harvard Business School, has suggested that rapidly increasing labor and raw material costs during the period studied, excess capacity in the industry, and changes in inventory valuations due to inflation and shifts in inventory methods may have been responsible for the price and profit relationships found. Labor and raw material costs increased sharply during the 1970–74 period. However, there is no reason to expect nor evidence to suggest that these costs increased more rapidly in concentrated markets than in less concentrated ones. The widespread practice of regional pattern setting union bargaining in food retailing makes it improbable that wage rates are influenced by the level of market concentration. There is also little reason to expect raw material costs to be related to market concentration. Thus, it seems likely that the higher operating expenses in concentrated markets suggested by our study results were due to factors such as overstoring, advertising and promotion expenditures, employee productivity, and company overhead expenses—i.e., expense factors that are largely controllable by management and that tend to become inflated in markets where competition is ineffective.

Rising raw material costs during the period had an inflating effect on stated retail profits where the FIFO method of inventory valuation was used. As a result, three chains included in the profit analysis switched from FIFO to LIFO in 1974 (see note to Appendix Table A.5). Since company profits in various divisions or SMSAs were analyzed for each individual year and for the average profits realized over the five year period, changing inventory valuations would not introduce any apparent bias into the analysis. Had the analysis been conducted using time series approach rather than cross sectional (e.g., an analysis of a firm's profits in a specific division across different years) changes in inventory valuation would be a valid concern. This was not the case, however.

Excess capacity in food retailing probably affects retail costs and prices. However, excess capacity helps explain our findings only if it is positively related to market concentration. If excess capacity is uniformly present in all markets or occurs randomly in different markets, it would not account for the higher pricees, higher profits, and inferred higher costs in concentrated markets. Although evidence is lacking, we expect excess capacity to be especially common in concentrated markets where it serves as a barrier to entry and as a depressant—not a stimulus—to competition.

Thus, while we respectfully acknowledge the alternative interpretations offered by Professor Goldberg, neither logic nor empirical evidence suggests that they are likely to account for the relationships found.

processing industry illustrates the point. From 1955 through 1964, wholesale bakers and food chains in the state of Washington successfully conspired to fix the price of bread. Prior to the conspiracy and after its termination in 1965, bread prices in Washington were about equal to the U.S. average.[7] During the conspiracy, prices were elevated between 15 and 20 percent above the U.S. average, resulting in an overcharge to consumers of about $3.5 million annually. But this large overcharge was not fully reflected in higher profits of the wholesale bakers. Whereas in 1964 wholesale bakers in Seattle enjoyed higher average profits than those located in five other states—3.1 percent of sales vs. 1.0 percent of sales—this was far short of the differences in prices.[8] Evidently, the absence of price competition among these bakers caused them to divert their competition to nonprice forms which resulted in inflating their selling and delivery costs to 9.7 cents per pound compared to an average of 6.7 cents per pound for bakers in other states.[9] This 3 cents difference was equal to 13 percent of the wholesale price. Thus, the higher, noncompetitive prices encouraged bakers to pursue policies that inflated their costs, thereby preventing them from capturing the full benefits of the conspiratorial prices. Based upon the results of the present study, a similar phenomenon appears to exist in grocery retailing.[10]

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[7] Federal Trade Commission, Economic Report on the Baking Industry, November 1967, pp. 66–71.

[8] Ibid., p. 110.

[9] Ibid., pp. 110–114.

[10] One possible source of inflated costs is excess store capacity in metropolitan areas. A Canadian study estimated that excess capacity increased grocery store cost by 4 percent. (Report of the Royal Commission on Consumer Problems and Inflation. Queen's Printer, Regina, 1968.) Dominant firms in concentrated markets may intentionally maintain excess capacity as a barrier to new entrants. Without evidence, this is only conjecture but worthy of investigation.

The definition of "excess capacity" is critical to any analysis. Mallen defined optimum capacity as that which would realize the minimum cost rate of store utilization. The utilization rate found to minimize costs was $11.25 per square foot of selling space per week. (Bruce Mallen and M. Haberman, "Economies of Scale: A Determinant of 'Overstoring and Super Storing'?", in Conference Proceedings of the Canadian Association of Admin. Sciences, Edmonton, 1975.) This is much higher than the $5.50 per square foot optimum utilization rate found by the National Commission of Food Marketing 10 years ago. Both studies found store utilization was the most important factor affecting store operating expenses; the absolute size of store had a modest influence.

Data in this study allowed a limited analysis of store operating expenses. Detailed expense data were available for 58 stores of one company in seven different SMSAs. The stores were comparable in departments (grocery, meat, produce and bakery) and ranged from 13,000 to 31,000 square feet in size. Multiple regression analysis of these data indicated the following results:

$$SOE/CGS = .33 - .000\ SS^2 - 1.422\ SU + .004\ SU^2 + 021\ M_2 + .030\ M_2 + .075\ M_3$$
$$(-0.85)\quad (-3.05)\quad (2.09)\quad (3.73)\quad (4.58)\quad (7.73)$$
$$R^2 = .68$$

Where:

SOE/CGS=Store operating expenses minus district and corporate allocated overhead expenses as percent of cost of goods sold.

SS=Store size in thousand square feet.

SU=Store utilization measured as cost of goods sold per thousand square feet.

M_1=Binary variable for Seattle SMSA.

M_2=Binary variable for Portland SMSA.

M_3=Binary variable for Northern California SMSAs (San Francisco, San Jose, and Sacramento).

Costs of goods sold was used to avoid the influences of price differences in different markets. However, a similar model was developed using sales instead of cost of goods sold. The results were essentially the same. When converted to the same base the minimum points on the two curves were similar—$4.66 and $4.80 in sales per square foot per week. Unfortunately, very few stores in the sample had utilization rates above $4.25 per square foot (i.e., two standard deviations from the mean utilization rate). Thus, although these results tend to support the NCFM results, the lower right hand portion of these cost curves (sales per square foot above $4.00) was not adequately defined with the available data.

Since the defined minimum cost points are beyond nearly all observations, there is little assurance that these are true minimums. The results do indicate, however, that the cost curves have levelled off and are relatively flat near the minimum cost point. For example, a 20 percent reduction in store utilization from the defined minimums increased operating expenses from 21.0 to 21.6 percent of cost of goods sold.

Average store wage rate was included as an independent variable in some models with similar overall results to the above. Significant collinearity was found between store size, wage rate, and the SMSA binaries. With a limited sample, the interrelated effects were difficult to isolate.

Estimated Monopoly Overcharge

The preceding analyses have provided strong evidence that both the level of market concentration (CR_4) and relative firm market share (RFMS) have a positive influence on the level of profits and prices. A relevant public policy question is, how much more do consumers pay for retail grocery products because some markets are not competitively structured? The term "monopoly overcharge" is used to express the difference between grocery prices in competitively structured markets and markets where market power exists.

Before we can make estimates of the extent of monopoly overcharges, we must first define what constitutes a competitively structured market. In our estimates, we shall assume a market is competitively structured where the top four firms make 40 percent of the sales and each of these firms holds 10 percent of the market, that is, where CR_4 is 40 and RFMS is 25. The CR_4 level was selected because the empirical analyses show that both profits and prices are continuing to rise in the range around CR_4 is 40. This suggests that competitive prices (where prices are equal to minimum long-run average costs including a return for capital invested and risk) occur when CR_4 is 40 or less. We select an RFMS of 25 as the appropriate one because in such market settings the four largest firms have equal market shares and therefore comparable positions of market power.

Using these assumptions, estimates were made of the percent overcharge in each of the 32 sample markets. Using equation 1g, Table 3.3, the grocery prices for each of the four leading firms in the 32 sample SMSAs were estimated using appropriate SMSA values for each variable specified. For all firms with estimated prices above a competitive level, the overcharges were then summed. The total monopoly overcharge across the 32 sample markets, expressed as a percent of the total sales of the leading four firms, was 1.6 percent, or $161 million in 1974.

Using the above estimate of the percentage monopoly overcharge, national monopoly overcharges were calculated. Since the above monopoly overcharge estimates apply to only the leading four firms in each SMSA, the sales total across all 263 Census SMSAs was multiplied by the weighted national mean four-firm concentration of 49.6 percent. The resulting estimate of the total sales of the four largest firms in all SMSAs ($41.4 billion) was then multiplied by 1.6 percent, yielding an estimate of national monopoly overcharges of $662.4 million in 1974.

These results indicate that in many markets consumers are paying the leading food retailers extremely large dollar overcharges due to their market power. Although this is not a precise estimate, it probably errs on the low side. First, it includes only sales of the top firms. There is reason to believe that in highly concentrated markets the entire price level tends to be higher, not just that of the four largest firms. Second, these estimates include only sales in SMSAs. About 27 percent of grocery store sales are made by retailers outside SMSAs. Since market concentration generally is higher in small communities than in SMSAs, there may be substantial monopoly overcharges in areas outside SMSAs.

The preceding discussion deals solely with aggregate monopoly overcharges. Actual overcharges vary considerably among cities. In cities where a strong dominant firm does not exist and where four-firm concentration does not greatly exceed 40, estimated monopoly overcharges are negligible. Examples of such cities are city j, which had no estimated monopoly overcharges, and city c, which had estimated overcharges by the top four firms of $1.6 million in 1974 (0.3 percent of sales). On the other hand, in cities with very high market concentration and one or more dominant firms, the overcharges are likely to be substantial. The leading example of such a city is city b, which has the second highest concentration of any large city and which has two dominant firms. We estimate 1974 monopoly overcharges of $83 million or 6.9 percent of sales for the top four chains in city b.

Unfortunately, data limitations make it impossible to precisely estimate monopoly overcharge nationwide. The firms and the SMSAs included in the price analysis were *not* preselected to be representative of all firms and all SMSAs; rather, their selection, as noted earlier, was based solely on the availability of adequate data. At the same time, however, we have no reason to suspect that the firms and markets included in the analysis are atypical. Thus, while there are limitations in the data used in the analysis there is no basis for concluding that our results are biased significantly in a particular direction.

The magnitude of our monopoly overcharge estimates may strike some as unrealistic. When grocery chains had average profits after taxes of less than 1 percent of sales from 1970–74, how can one contend that there were monopoly overcharges of 1, 2 or 5 percent? First, the estimates are of price overcharges, not of excess profits, and are pretax. A 1 percent drop in prices, all else remaining the same, would reduce post tax profits by about 0.6 percent.

Second, the period included in the profit analysis was atypical for the grocery retailing industry by nearly any standard. During more normal periods, the profit-sales figures included in the analysis would likely have been at least 50 percent higher based upon Cornell University's annual studies of grocery chains (Appendix Table A.3). Even the profit figures on which the estimates in Table 4.1 are based (1970, 71 and 74) are significantly lower than the long-term average in food retailing.

Finally, the results of the analyses suggest that averages may be seriously misleading. If expenses and profits are both inflated in markets where considerable monopoly power exists—as the data suggest—then profit levels provide only a partial indication of possible monopoly overcharges. The inflated costs that frequently accompany monoplastic situations must also be included in any estimate of overcharges.

Perhaps part of the explanation is the practice of cross subsidization across markets where a firm "robs Peter to pay Paul." Undoubtedly, some of this does occur among large multimarket food chains, whose unprofitable divisions are subsidized by profitable ones. The result is to lower the average profits of chains that "carry" divisions that could not survive if forced to rely solely on their own resources. Although we believe cross subsidization provides only a partial explanation, cross subsidization by itself is not an untarnished virtue. Where

cross subsidization involve charging different prices to customers in different markets, it penalizes some customers and subsidizes others. In addition, since only multi-market or multi-industry firms can engage in cross subsidization, single-market grocery retailers may be placed at a serious competitive disadvantage if large chains choose to charge loss producing prices in a particular market while reaping profits from other markets. Moreover, even if a chain does not charge higher prices in an unprofitable division, welfare losses result if the inefficient division remains in business for protracted periods despite its higher costs and resulting losses. In this case, society would be better served if the retail services were provided by more efficient firms.

We conclude, therefore, that substantial market power exists in grocery retailing in many markets. This results in consumers paying considerably higher prices than if competition were more effective. Based upon our analysis, food prices and retail operating expenses would be significantly reduced by actions that led to lower market concentration and lower market shares for firms that now hold dominant positions in some markets.

Appendix A. SUPPORTING TABLES FOR CHAPTER 1

APPENDIX TABLE A.1.—PERCENTAGE OF GROCERY STORE SALES MADE BY SINGLE AND MULTI-STORE OPERATORS, CENSUS YEARS, 1948–72

[In percent]

Number of units	Year					
	1948	1954	1958	1963	1967	1972
Single stores	58.7	51.8	47.0	43.1	38.9	32.2
2 to 3 stores	3.6	4.8	4.8	5.0	5.0	5.1
4 to 10 stores	3.2	4.0	4.2	4.8	4.8	5.7
Total independents [1]	65.5	60.6	56.0	52.9	48.7	43.0
11 to 100 stores	7.0	9.9	11.7	12.6	15.3	17.4
100 stores	27.4	29.4	32.3	34.5	36.1	39.6
Total chains [1]	34.4	39.3	44.0	47.1	51.4	57.0

[1] Independents include single unit operations as well as multi-unit operations of fewer than 11 stores. No distinction is made between affiliated and unaffiliated independents. Chains are defined as multi-unit operations with 11 or more stores under the same management.

Note: Details may not total due to rounding.

Source: U.S. Bureau of the Census, "Census of Retail Trade, 1972, Subject Series, Establishment and Firm Size" (including legal form of organization) RC 72–S–1, U.S. Government Printing Office, Washington, D.C., 1975. U.S. Bureau of Census, " Census of Retail Trade, 1967, Subject Reports, U.S. Summary," U.S. Government Printing Office, Washington, D.C., 1970. U.S. Bureau of Census, "Census of Retail Trade, 1963, Subject Reports, U.S. Summary," U.S. Government Printing Office, Washington, D.C., 1966. U.S. Bureau of Census, "Census of Retail Trade, 1958, Subject Reports, U.S. Summary," U.S. Government Printing Office, Washington, D.C., 1960.

APPENDIX TABLE A.2.—TYPICAL GROSS PROFIT MARGINS AND OPERATING EXPENSE RATIOS FOR SUPER-MARKETS,[1] 1965 TO 1974

[Median percent of sales]

Item	Year									
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Store door margin	18.1	18.2	18.3	18.2	18.0	18.4	17.7	17.9	17.6	17.7
Expenses:										
Store labor	8.2	8.5	8.7	8.8	8.9	9.2	9.3	9.7	9.3	9.4
Advertising and promotion [2]	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	.9	.9
Store supply	.8	.9	.8	.8	.9	.9	.8	.8	.8	.9
Rent and real estate	1.5	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.3	1.3
Utilities	.6	.6	.6	.6	.6	.6	.7	.7	.7	.8
Equipment depreciation or rental costs	.8	.7	.7	.7	.7	.7	.7	.7	.7	.6
Maintenance and repairs	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4
All other expenses	1.2	1.2	1.1	1.2	1.0	1.0	1.1	1.2	1.0	1.1
Total operating expenses	16.1	16.3	16.2	16.1	16.3	16.5	16.3	16.5	16.0	16.3
Net operating profit	1.8	1.8	1.8	1.6	1.4	1.9	1.5	1.2	1.7	1.5

[1] All firm analysis.

[2] Advertising and promotion expense does not include trading stamp expense. Trading stamp expense was not included among store operating expenses because the incidence of trading stamp usage by grocery chains has waned during the past 10 years. To report the median figure for trading stamp expense would result in an overstatement of this expense classification since most grocery chains no longer issue these stamps. SMI data indicates that about 25 percent of the firms reporting issued trading stamps in 1974.

Note.—Detail may not add to total due to the use of median figures.

Source: Super Market Institute, "Figure Exchange," 1965–74.

APPENDIX TABLE A.3.—GROSS MARGINS, SELECTED EXPENSES AND EARNINGS FOR GROCERY CHAIN STORE OPERATIONS, 1965-74

[In percent]

Item	Year—									
	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Gross margins	22.32	22.32	21.46	21.48	21.31	21.39	21.53	20.93	20.90	21.15
Expense:										
Payroll	10.51	10.46	10.51	10.53	10.65	11.09	11.38	11.57	11.59	11.71
Supplies	.96	.97	.88	.90	.92	1.01	.94	.93	.97	1.12
Utilities	.78	.76	.75	.73	.71	.74	.78	.79	.82	.94
Services purchased	1.25	1.34	1.33	1.22	1.36	1.31	1.25	1.36	1.25	1.21
Promotional activities	1.48	1.41	1.35	1.49	1.43	1.32	1.20	1.07	.71	.51
Property rentals	1.84	1.78	1.69	1.58	1.52	1.49	1.46	1.42	1.40	1.37
Depreciation	.97	.91	.89	.84	.82	.85	.86	.81	.81	.75
Other [1]	2.83	2.96	2.83	2.90	2.77	2.66	2.72	2.52	2.92	2.91
Total expense before interest	20.62	20.59	20.33	20.19	20.18	20.47	20.59	20.74	20.47	20.52
Total interest	.76	.74	.74	.70	.69	.73	.69	.65	.60	.64
Total expenses	21.38	21.33	20.97	20.89	20.87	21.20	21.29	21.39	21.08	21.17
Net operating profit	.94	.90	.49	.59	.45	.19	.23	−.46	−.18	−.02
Net other income	1.46	1.33	1.38	1.44	1.41	1.54	1.32	1.40	1.28	1.28
Total net earnings before income tax	2.40	2.23	1.87	2.03	1.86	1.73	1.56	.94	1.10	1.26
Total income taxes	1.09	1.04	.88	1.01	.94	.87	.73	.44	.54	.57
Net earnings	1.31	1.19	.99	1.02	.92	.86	.82	.49	.56	.67

[1] Includes the following expenses: Communications, travel, professional service, donations, insurance, taxes and licenses (except income taxes), equipment rental, repairs and unclassified.

Note.—Details may not total due to rounding.

Source: "Operating Results of Food Chains," Cornell University, Ithaca, N.Y., selected years.

APPENDIX TABLE A.4.—NET PROFITS[1] AFTER INCOME TAXES AS PERCENT OF STOCKHOLDERS' EQUITY FOR LEADING FOOD CHAINS, 1963–74[2]

Company and 1973 sales classification	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974[3]
$1,000,000,000 and over:												
Allied	12.1	11.0	10.5	9.5	7.0	3.4	−10.8	−36.9	3.7	9.9	1.7	−8.5
Acme	9.1	8.4	6.6	5.8	5.1	6.4	7.1	8.1	6.5	.5	9.0	13.0
Food Fair	7.6	8.9	11.6	10.7	9.2	9.7	n.a.	8.1	8.1	−1.0	1.6	6.4
Grand Union	8.5	10.7	11.2	10.4	10.0	10.2	11.2	10.8	8.5	5.4	1.5	6.2
A & P	10.3	9.0	8.8	9.2	8.9	7.1	8.0	7.4	2.2	−8.6	2.0	−35.4
Jewel	11.1	12.1	12.8	12.2	12.3	13.1	13.0	−1.9	12.2	12.5	13.8	10.6
Kroger	9.8	11.9	12.8	11.3	9.6	12.1	12.5	12.0	9.2	5.2	7.6	10.8
Lucky	14.0	19.5	22.6	22.6	26.4	26.7	26.8	23.0	22.6	19.7	18.9	20.5
Safeway	14.3	14.7	13.9	15.7	12.6	12.8	11.9	13.9	14.7	15.0	13.1	16.5
Southland	n.a.	18.6	18.0	18.3	20.4	12.1	13.1	13.2	13.0	10.5	10.9	12.2
Stop & Shop	13.3	13.0	9.5	12.6	16.2	12.7	12.6	9.1	5.6	9.6	12.2	14.7
Supermarket General	21.3	23.2	24.5	17.6	22.4	19.9	13.4	14.4	16.1	6.4	10.9	3.7
Winn-Dixie	21.3	20.9	23.5	20.2	20.2	20.0	18.7	20.3	19.7	19.1	18.8	22.8
Weighted average	11.5	11.8	11.9	11.9	11.1	11.0	11.2	11.0	10.1	6.8	9.5	7.1
$500 to $1,000,000,000:												
Albertson's	19.1	21.4	22.2	17.9	17.5	15.2	15.5	14.2	15.5	16.5	17.7	19.3
Arden-Mayfair	7.4	9.0	13.5	10.2	1.0	6.6	5.2	−7.4	5.0	−2.6	−82.6	9.9
Colonial	10.6	11.6	12.1	13.2	11.8	13.0	11.0	11.9	12.7	10.8	13.7	15.5
Dillon	18.0	17.0	17.9	16.7	17.8	15.5	16.0	17.6	19.2	19.3	21.0	22.0
First National	7.4	6.6	2.5	−.8	−7.8	1.4	5.6	4.2	−.9	.04	−22.7	9.0
Fisher	−1.8	−2.5	−.5	10.8	19.9	22.0	17.6	17.5	19.0	16.8	16.8	18.9
Giant	10.1	10.3	14.0	11.5	13.8	14.3	15.6	9.8	16.9	12.4	12.3	14.0
National Tea	7.2	8.9	8.9	9.2	8.8	6.0	8.0	6.1	7.0	−38.7	−19.8	−3.5
Pueblo International	20.0	20.4	21.5	21.4	18.2	23.6	19.9	11.1	14.3	−1.6	9.5	4.1
Weighted average	8.6	9.5	9.8	9.0	7.2	9.7	10.8	8.4	10.3	.8	1.3	12.2
22 chains over $500,000,000: Simple average	11.9	12.9	13.6	13.0	12.8	12.9	12.0	8.5	11.5	6.2	4.0	9.2
24 chains under $500,000,000:												
Weighted average	10.1	11.7	11.2	11.5	10.9	11.8	11.1	9.8	8.5	5.8	5.6	7.2
Simple average	12.1	14.7	13.8	13.0	12.4	12.4	11.3	10.3	8.4	2.8	4.2	4.7
Total weighted average	10.9	11.5	11.5	11.4	10.6	10.9	11.1	10.5	9.9	5.8	8.0	7.8
Total simple average	12.0	13.8	13.7	13.0	12.6	12.7	11.6	9.5	9.9	4.4	4.1	6.8

[1] Includes extraordinary items.
[2] Data for fiscal years ending or or before June 30 are applicable to the prior year.
[3] See note for tabla A.5 for adjustments made due to changes in inventory valuation methods.

Source: Staff Economic Report on Food Chain Profits, Federal Trade Commission, report R-6-15-23 p. 31.

APPENDIX TABLE A.5.—NET PROFITS[1] AFTER INCOME TAXES AS PERCENT OF SALES FOR LEADING FOOD CHAINS, 1965-74[2]

Company and 1973 sales classification	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
$1,000,000,000 and over:												
Allied	1.2	1.1	1.0	0.8	0.5	0.2	−0.5	−1.3	0.1	0.4	0.1	0.3
Acme	1.2	1.1	.9	.7	.6	.7	.8	.8	.7	.05	.8	1.0
Food Fair	.7	.8	1.0	.9	.8	.8	NA	.6	.6	−.1	.1	.4
Grand Union	1.1	1.3	1.4	1.3	1.2	1.3	1.4	1.3	1.0	.6	.2	.6
A. & P	1.1	1.0	1.0	1.0	1.0	.8	.9	.9	.3	−.8	.2	−2.3
Jewel	1.5	1.6	1.7	1.6	1.4	1.6	1.5	1.5	1.5	1.5	1.6	1.2
Kroger	1.1	1.2	1.2	1.1	.9	1.1	1.1	1.1	.9	.5	.7	1.0
Lucky	1.2	1.6	1.7	1.7	1.8	1.4	1.7	1.6	1.7	1.5	1.4	1.5
Safeway	1.7	1.8	1.6	1.8	1.5	1.8	1.3	1.4	1.5	1.5	1.3	1.5
Southland	NA	1.3	1.4	1.3	1.5	1.5	1.5	1.5	1.6	1.7	1.7	1.8
Stop & Shop	1.3	1.2	.9	1.1	1.4	1.0	1.0	.7	.4	.6	.8	1.0
Supermarket General	NA	NA	1.4	.9	1.2	1.4	1.0	1.0	1.0	.4	.6	.2
Winn-Dixie	2.3	2.5	2.7	2.3	2.3	2.1	1.0	2.1	2.1	2.0	1.9	2.2
Weighted average	1.3	1.3	1.3	1.3	1.2	1.1	1.1	1.1	1.0	.6	.9	.6
$500,000,000 to $1,000,000,000:												
Albertson's	1.5	2.0	1.9	1.4	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.1
Arden-Mayfair	.7	1.0	1.1	.8	.1	.5	.4	−.4	.3	−.2	−2.8	0.4
Colonial	1.1	1.2	1.3	1.4	1.3	1.5	1.2	1.3	1.4	1.3	1.3	1.5
Dillon	1.8	1.6	1.8	1.6	1.7	1.8	1.8	1.7	1.8	1.8	1.7	1.8
First National	1.0	.9	.3	−.1	−1.0	.2	.6	.4	−.1	0	−1.7	0.6
Fisher	.2	.3	−.04	.8	1.8	1.6	1.3	1.3	1.4	1.2	1.1	1.1
Giant	1.0	1.1	1.4	1.1	1.3	1.3	1.4	.9	1.5	1.4	1.1	1.2
National Tea	.8	.9	1.0	.9	.9	.6	.7	.5	.6	−3.3	−1.6	−.2
Pueblo International	4.2	3.9	4.2	4.3	2.8	1.7	1.6	1.0	1.4	−.1	.8	.3
Weighted average	1.0	1.1	1.1	.9	.7	.9	1.0	.7	.9	.1	.1	.8
24 chains under $500,000,000: Weighted average	1.1	1.3	1.3	1.3	1.3	1.3	1.2	1.0	.9	.6	.5	.6
Total weighted average	1.2	1.3	1.3	1.2	1.1	1.1	1.1	1.0	1.0	.6	.7	.6

[1] Includes extraordinary items.
[2] Data for fiscal years ending on of before June 30 are applicable to the prior year.

Note: In 1974 Acme, Colonial, Giant, Safeway and Winn-Dixie switched to the LIFO (last in, first out) accounting method for inventory valuation. The change to this method of accounting effectively reduced 1974 net earnings for those companies and decreased both their profit/sales and profit/stockholder equity ratios. In order to maintain a consistent basis for evaluating all firms over time, the profit/sales and profit/stockholder equity ratios for the affected firms have been restated in FIFO (first in, first out) for 1974 on this table and table A.4. The profits/sales and profits/stockholder equity ratios for the affected firms under LIFO are as follows:

	Profit/sales (LIFO)	Profit/stockholder equity(LIFO)
Acme	0.7	9.0
Colonial	1.0	11.2
Giant	.9	11.1
Safeway	1.0	11.4
Winn-Dixie	1.9	10.1

Source: Staff Economic Report on Food Chain Profits, Federal Trade Commission, Report 3R-6-15-20, p. 49.

APPENDIX TABLE A.6.—FOOD PRODUCTS MANUFACTURED BY THE 40 LARGEST CHAINS, 1963 AND 1967

[Dollars in thousands]

Census industry code		Number of companies reporting production			Value of shipments of the top 40 chains reporting		
		1963	1967	Net change	1963	1967	Percent change
2011	Meat packing	4	5	1	$220,165	$271,435	23.3
2013	Prepared meats	9	10	1	46,029	41,063	−10.8
2015	Poultry dressing	3	2	−1	(1)	(1)	(1)
2021	Butter	5	4	−1	9,081	8,775	−3.4
2022	Natural cheese	8	5	−3	8,187	4,537	−44.6
2023	Concentrated milk	9	5	−4	48,576	48,419	−0.3
2021	Ice cream	17	16	−1	86,527	107,527	24.3
2026	Fluid milk	13	13	0	259,449	363,145	40.0
2031	Canned seafoods	2	1	−1	(1)	(1)	(1)
2032	Canned specialties	3	4	1	(1)	16,499	(1)
2033	Canned fruits and vegetables	10	10	0	56,177	44,282	−21.2
2034	Dehydrated fruits and vegetables	2	1	−1	(1)	(1)	(1)
2035	Pickles and sauces	10	11	1	25,050	31,764	26.8
2036	Packaged seafoods	2	2	0	(1)	(1)	(1)
2637	Frozen fruits and vegetables	12	10	−2	12,412	11,331	−8.7
2041	Flour milling	3	1	−2	(1)	(1)	(1)
2042	Dog and cat food	0	1	1	0	(1)	----------
2015	Flour mixes	1	2	1	(1)	(1)	(1)
2046	Wet corn	1	2	1	(1)	(1)	(1)
2051	Bread products	30	28	−2	419,388	451,452	7.6
2052	Biscuits and crackers	16	20	4	47,625	51,457	8.0
2071	Confectionery products	9	11	2	50,900	54,194	6.5
2072	Chocolate products	1	1	0	(1)	(1)	(1)
2086	Soft drinks	6	7	1	4,197	15,300	264.5
2087	Flavorings	6	7	1	5,753	8,364	45.4
2091	Cotton seed oil	1	0	−1	(1)	0	100.0
2092	Soybean oil	1	0	−1	(1)	0	100.0
2094	Grease and edible tallow	1	0	−1	(1)	0	100,0
2095	Roasted coffee	21	19	−2	155,759	131,368	−15.7
2096	Shortening and cooking oils	2	1	−1	(1)	(1)	(1)
2098	Marcaroni and noodles	1	1	0	(1)	(1)	(1)
2099	Miscellaneous	13	20	7	80,866	97,603	20.7
	Total				1,609,502	1,822,628	13.2

[1] Not shown because of disclosures of individual company data.

Source: "Economic Report on the Dairy Industry," staff report to the Federal Trade Commission, U.S. Government Printing Office, Washington, D.C., March 1973. Data are from the Federal Trade Commission, 1965 and 1969 food retailing survey.

APPENDIX TABLE A.7.—AVERAGE 4-FIRM CONCENTRATION RATIOS FOR A SAMPLE OF 194 SMSA's, CLASSIFIED BY MAGNITUDE OF DEFINITIONAL CHANGE BETWEEN 1954 AND 1972

Magnitude of definitional change in SMSA [1]	Number of SMSAs	Percent of sample	Average CR_4		Percentage change in average CR_4	Mean growth [2]
			1954	1972		
			Percent			
No change	85	43.8	44.8	53.9	20.3	210.5
Less than 10 percent	39	20.1	45.2	52.5	16.2	183.1
10.0 percent to 19.9 percent	31	16.0	44.8	48.4	8.0	164.5
20.0 percent to 29.9 percent	16	8.2	45.3	48.6	7.3	242.4
Over 30 percent	23	11.9	46.7	50.2	7.5	193.4
Total	194	100.0	45.1	52.1	15.5	199.6

[1] Change in SMSA definitions between 1954 and 1972 were treated as if they had occurred in 1972. The 1972 grocery store sales for the area added to each SMSA between 1954 and 1972 was taken as a percent of the 1972 grocery store sales of the SMSA as defined in 1954. Thus, the magnitude of the definitional change indicates the percentage increase in the size of the SMSA attributable to the change in definition.

[2] Growth is the percentage increase between 1954 and 1972 in the undeflated grocery store sales of the sample SMSAs as they were defined in 1972; thus, comparable geographic areas were used to calculate SMSA growth. Census data limitations precluded the computation of growth estimates for 19 of the 194 SMSA in the sample. These SMSA's were located principally in New England States.

Source: Bureau of Census, "1954 Census of Business Retail Trade," U.S. Government Printing Office, Washington: 1975; concentration ratios are from special tabulations by Bureau of Census for 1954 and 1972.

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APPENDIX TABLE A.8.—ACQUISITIONS OF GROCERY RETAILERS BY NONGROCERY STORE FIRMS, 1967–74

Year	Acquiring firm	Acquired firm	Acquired firm's sales (millions)
1967	Gamble-Skogmo, Inc	Red Owl	$488
1967	E.F. MacDonald Co	Shopping Bag Stores	110
1968	Petrolane, Inc	Stater Bros	77
1968	General Host Corp	Li'l' General Stores	44
1968	Federated Department Stores	Ralph's Grocer Co	160
1969	Ruddick Corp	Harris-Teeter	70
1970	Household Finance	Von's Grocery Co	247
1970	J.C. Penney Co	Supermarket Interstate, Inc	111
1971	Pneumo Dynamics Corp	P. & C. Food Markets, Inc	119
1972	Brown & Williamson Tobacco Co	Kohl's	205
1974	Caveham (Overseas Ltd.)	Grand Union Co	1,400

Source: Various secondary sources.

APPENDIX TABLE A.9.—HORIZONTAL ACQUISITIONS DURING 1967–75 BY THE TOP 20 FOOD RETAILERS OF 1975 BY SMSA

Acquiring firm's share of SMSA sales	Acquired firm's share of grocery store sales in SMSA (percent)										
	0–1	1	2	3	4	5	6	7	8	9	10
Under 1 percent	0	1	0	0	0	0	0	0	0	0	0
1 percent	4	0	0	0	0	0	0	0	0	0	0
2 percent	2	0	0	0	0	0	0	0	0	0	0
3 percent	3	0	0	0	0	0	0	0	0	0	0
4 percent	0	1	0	0	0	0	0	0	0	0	0
5 percent	4	2	0	0	0	0	0	0	0	0	0
6 percent	0	1	0	0	1	0	0	0	0	0	0
7 percent	0	0	0	0	0	0	0	0	0	0	0
8 percent	1	0	0	0	0	0	0	0	0	0	0
9 percent	1	0	1	0	0	0	0	0	0	0	0
10 percent	0	0	1	0	0	0	0	0	0	0	0
11 percent to 15 percent	4	0	2	0	0	0	0	0	0	0	1
16 percent to 20 percent	4	0	0	0	0	0	0	0	0	0	0
Over 20 percent	1	0	0	1	0	0	0	0	0	0	0
Total	24	5	4	1	1	0	0	0	0	0	1

Note.—In cases where a chain acquired a retailer operating in more than 1 SMSA, the acquired stores are allocated to the appropriate SMSA.

Source: Same as table 1.4.

APPENDIX TABLE A.10.—LARGE HORIZONTAL ACQUISITIONS DURING 1967–75 BY GROCERY RETAILERS OTHER THAN THE 20 LARGEST IN 1975, BY SMSA

Acquiring firm's share of SMSA sales	Acquirod firm's share of grocery store sales in SMSA (percent)								
	0–1	1	2	3	4	5	6	7	8
Under 1 percent	1	1	0	0	1	0	0	0	0
1 percent	1	1	0	1	0	0	0	0	0
2 percent	2	3	1	0	1	0	0	1	0
3 percent	0	2	0	1	0	0	0	0	0
4 percent	3	0	0	1	1	0	0	0	0
5 percent	0	1	0	0	1	0	0	0	0
6 percent	0	1	1	0	0	0	0	0	0
7 percent	1	0	0	0	0	0	0	0	0
8 percent	0	1	0	0	0	1	0	0	0
9 percent	0	0	0	0	0	0	0	0	0
10 percent	1	0	0	0	0	0	0	0	0
11 percent to 15 percent	0	1	0	0	1	0	0	0	1
16 percent to 20 percent	0	0	1	0	0	0	0	0	0
Over 20 percent	1	0	0	0	0	1	0	0	0
Total	10	11	3	3	5	2	0	1	1

Note.—Large mergers are defined as those in which the acquired retailer had sales of $10,000,000 or more. In cases where a chain acquired a retailer operating in more than 1 SMSA, the acquired stores are allocated to the appropriate SMSA.

Source: Same as table 1.4.

Appendix B. SUPPORTING MATERIAL FOR CHAPTERS 2 AND 3

Method of Constructing Market Basket Data

Data used in the price analysis were drawn from price comparison reports submitted by major retail food chains to the Joint Economic Committee. These reports were not conducted at the request of the Joint Economic Committee, but were surveys that had been conducted by the companies for their own purposes prior to the J.E.C. data request. The price surveys varied with respect to the number and type of items price checked, date(s) on which the price checks were conducted, forms on which the price checks were taken, and the number of price comparison reports submitted by each company.

Only two chains submitted price information on a substantial number of items and for a large number of SMASs. These price surveys were for the month of October 1974. For these two chains, firms H and K, a "market basket" was developed containing a broad cross section of products on which prices were available from the price comparison reports. Meat and produce items were not included in the market basket because data for these items were incomplete. It was possible to develop the cost of a market basket of dairy, frozen foods and grocery products. For firm H it also was possible to include health and beauty aids.

In several cases, difficulties were encountered in drawing prices from the price comparison reports because:

1. Two or more price surveys were submitted by a company for a particular SMAS during October 1974.
2. Two or more prices for the same item were recorded on the same price check.
3. Prices were not recorded for items in the market basket.
4. Several private label brands were carried by the companies, raising questions as to which private label brand was most comparable to the national brand included in the market basket.

With respect to the first two difficulties, prices believed to be in effect on or nearest to October 15, 1974, were chosen. Where the price in effect closest to October 15 could not be ascertained, the company involved was asked to clarify the approximate date the prices were in effect. The third major difficulty was partially resolved by excluding those SMSA price surveys that covered relatively few items. In those cases where a small percentage of the items contained in the market basket were omitted, an estimate of the prices was made.[1] If a large percent of any one major group or sub-group of items was omitted, but not a large percent of the total market basket, then that particular group of items was deleted.

Private label brands chosen were based upon quality as measured by price. For example, brand "a" and brand "b" are two firm K private label brands for peanut butter.[2] In the preliminary examination it was found that brand "a" pea-

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[1] Estimate of prices were based on other price surveys submitted by a given firm. Generally, these estimates were based on mean prices observed from SMSAs located within the same geographic region. Also, when possible, estimates were based upon the ratio of prices between SMSAs. For example, assume that for two SMSAs geographically located near one another, prices were observed, respectively, for canned peaches of $.20 and $.25. If the first SMSA had an observed price of .30 for canned pears and the second SMSA did not price check that product, the estimated price was calculated,

$$\frac{.20}{.25}=\frac{.30}{X};\ X=.375 \text{ or } \$.38.$$

It was necessary to make estimates for less than 3 percent of the grocery prices used in the analysis.

[2] Firm K reported in their 1973 annual report that firm K carries approximately 3,000 items under a private label brand. Note that the terms "product" and "items" are not synonymous. Products are differentiated by the type of food (canned peas) whereas items are differentiated according to brand and package size. Thus, it is possible to be referring to one product when comparing ten items.

nut butter was generally priced higher than brand "b" peanut butter. As such, it was assumed that brand "a" peanut butter was of a higher quality and thus was chosen as the private label brand to be included in the market basket. Once having made the choice of the private label brands for each company, only those brands were used in the tabulating costs of grocery items.[3]

The products included in the market basket were selected after screening eighteen price comparison reports submitted by firm A, firm H and firm K. Products chosen were those most frequently price checked.[4] The general market basket contained 127 distinct products (see Appendix Table B.3). Seventy of the products were price checked with respect to both national brand and private label, bringing the total number of items in the general market basket to 197. Appendix Table B.1 indicates the number and type of products included in the firm K and firm H market baskets.

The product group and market basket data were developed by the following weighting procedures. First, different weights were assigned national brand and private label brands of particular products based on the estimated consumption of each. These estimates relied on data from National Commission on Food Marketing Technical Study No. 10 and from Selling Areas Marketing, Inc. (SAMI) for the Cincinnati-Dayton-Columbus market area. The weights reflect the proportion of a product's sales realized by national brands and "other" brands (Appendix Table B.3).

Weighting the individual products according to national brand and private label weights takes into account the impact of buying a particular brand on the average price of a particular product. These weights do not take into account the relative importance of a particular product in terms of overall food consumption or expenditures on all food consumed. Therefore. the price of each product was weighted by the expenditures on that product relative to the expenditures on all food products. For example, if milk represents 2 percent of the total expenditures for food at home and grapefruit represents .5 percent, the prices of the two products would be weighted by .02 and .005.

The expenditure weights used in this study are based on a recent study by Chain Store Age. As Appendix Table B.2 indicates, several important product categories were not included in the market basket due to lack of data. Meat, produce and bakery products were the most important unrepresented categories. Together these account for 36 percent of consumer expenditures in supermarkets. Several product groups in the grocery department were also not represented. These account for an additional 13 percent of consumer expenditures. In large part, these were tobacco, alcoholic beverages or non-food products.

Thus, the products included in the market basket represent those categories that account for approximately one-half of a supermarkets' sales. Within each category, several products were generally priced. For example, nine frozen food products were included in the market basket. Together these accounted for 5.43 out of the 6.10 percent of expenditures that are spent for frozen foods. In assigning weights, it was assumed that the price of a single product (e.g. Campbell's tomato soup) was an accurate indicator of the price level for closely related products (e.g. canned condensed soups). Products were weighted accordingly. In total, the products included in the market basket account for 37 percent of consumer expenditures in supermarkets and are felt to be representative of product categories accounting for one-half of expenditures.

Meat Baskets in Case Markets

The price data submitted on meat products were limited in the number of markets covered and in the consistency of products price checked from one market to another. For three case markets however the available meat price data allowed the construction of a meat basket. The types and cuts of meat selected were similar to those included in the Consumer Price Index. Quantity weights were developed from the Household Food Consumption Survey 1965–66. Since the cost of meat baskets were used only for comparison within an SMSA, minor variations

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[3] An additional aid in determining which private label brands should be compared with national brands came from price surveys. One chain conducting a survey in city b. showed its comparisons on computer print out sheets which arrayed products in such a manner as to place competing private label and national brand items in a clearly distinguishable manner.

[4] Results of the screening process demonstrated that firm A did not price check the same items across SMSAs with enough frequency to allow for meaningful analysis of the firm A prices submitted.

in the cuts included for different SMSAs were allowed (e.g. sirloin steak instead of T-bone).

The costs of the various baskets were indexed in these case studies because quantity weights were used in calculating the cost of the meat basket whereas expenditure weights were used for other products. The meat and market baskets were combined by weighting the index for each basket by the percent of consumer expenditures represented by the basket. Chain Store Age shows that expenditures on non-meat items account for 77.27 percent of all expenditures in supermarkets. Thus the market basket index was multiplied by .7727 and the meat basket index by .2273 to produce a combined meat and market basket index.

Estimation of Firm Market Shares

Estimation of 1972 and 1974 firm market shares and relative firm market shares relied heavily upon four sources; company supplied sales data, the 1974, 1975 and 1976 editions of Grocery Distribution Guide published by Metro Market Studies (hereafter referred to as Metro '74, etc.) 1972 Census of Retail Trade, and Sales Management's estimates of 1974 supermarket sales by SMSA.[5]

The 1972 firm market shares used in the price analysis were primarily estimated using company supplied sales data and Census data. Of the 36 observations used in the price analysis, the RFMS estimates for 23 (64%) were based upon sales data supplied by the companies (hereafter referred to as "hard" market shares).[6] The remaining 13 observations were estimated using Metro '74 data, Census CR_4's and the available "hard" market shares for other firms present in the market.[7] The ratio of the Census CR_4 to the Metro CR_4 for 1972 was used to adjust the market shares of the four leading firms reported in Metro '74. If "hard" market share data for any of the four leading firms were available, the ratio of Census CR_2 or CR_3 to Metro CR_2 or CR_3 was used to adjust Metro's market shares for the leading firms without hard data.

Estimates of market share for firms not ranking in the top 4 were calculated by taking the ratio of $1-CR_4$ (Census) to $1-CR_4$ (Metro) after subtracting available hard market shares. Thus, for each market two ratios were calculated, one for adjusting Metro market shares for the leading 4 firms and one for adjusting the market shares of all other firms. These ratios were also used to adjust the average market shares reported in the 1975 and 1976 editions of Metro.

The 1972 "hard" market shares were computed using company sales by SMSAs when it was available and Census total grocery store sales by SMSA. "Hard" market shares for 1974 were estimated using company supplied sales data and total "supermarket" sales by SMSA for 1974 as reported by Sales Management. Since companies were requested to supply data for the first three quarters of 1974, company sales data for 1974 were generally for the first six to nine months. In estimating "hard" market shares, Sales Management supermarket sales figures were adjusted to be consistent with the proportion of the year represented in company sales data. For example, if a firm supplied sales data for selected SMSAs through September 1974, Sales Management's sales data were multiplied by .75. The estimated market share was assumed to hold for the entire year.[8]

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[5] In addition, two other sources, Market Scope published by Progressive Grocer and Grocers' Spotlight published by Shamie were used in calculating market shares for Lynchburg and Roanoke, Va., and Springfield, Ohio. The methods used in adjusting the reported market shares were the same as those to be described above.

[6] We have not used the Census CR_4 of 32.1 for Youngstown because we believe it in error. Based on hard data for three firms and an estimate for one, we estimate the correct CR_4 to be 42.4.

[7] Metro estimates of market share do not follow a calendar year. The Metro 1974 estimates of market share were approximately for the period July 1, 1972–June 30, 1973. Because of definitional differences between the 1973 and 1974 Metro editions, Metro 74 was used to estimate 1972 market shares. For the 1974 estimates of market shares, the average of the 1975 and 1976 editions of Metro were used since they collectively applied for the period July 1, 1973–June 30, 1975.

[8] The quality of the 1974 "hard" market share data depended heavily upon the accuracy of Sales Management's estimates of total supermarket sales. Definitions of SMSAs and of supermarket sales were also important. The SMSA definitions used by Census and Sales Management were identical for 1972 for those markets used in the price analysis. Sales Management's supermarket sales figures were approximately equivalent to Census' total grocery store sales. In order to evaluate the accuracy of Sales Management's estimates the computed 1974 "hard" market shares for each firm were compared with the 1972 "hard" market shares to identify any radical errors. With the exception of the Denver-Boulder SMSA, the differences in these estimates were small. Sales Management's estimate of 1974 supermarket sales for the Denver-Boulder SMSA was judged to be understated and was adjusted by the ratio of the 1972 Census estimate of grocery sales to the 1972 estimate of supermarket sales reported by Sales Management. Estimates of market shares using the adjusted supermarket sales figure were consistent with private industry estimates.

Market shares estimated from "hard" data or from Metro Market for the leading four firms were summed to arrive at an estimated 1974 CR_4 for each SMSA. The individual firm market shares were used in conjunction with the estimated CR_4s in calculating each firms relative market share (RFMS).

Market shares shown in Tables 3.5–3.8 were not necessarily used in the regression analysis or in estimating monopoly overcharges. To avoid disclosure of any firm's actual market share, market shares shown in Tables 3.5–3.8 were estimated following the same procedure used in estimating 1972 market shares only ignoring "hard" market shares and using the estimated 1974 CR_4s. Thus, the individual market shares shown were not necessarily those used in the analyses. However, the CR_4s in these tables were used in the analysis.[9]

APPENDIX TABLE B.1.—NUMBER OF PRODUCTS AND ITEMS INCLUDED IN FIRM K AND FIRM H MARKET BASKETS

Product categories	Firm K	Firm H
Grocery basket:		
National brand	94	94
Private label	57	46
Dairy:		
National brand	7	7
Private label	3	4
Frozen foods:		
National brand	9	9
Private label	3	4
Health and beauty aids:		
National brand	0	17
Private label	0	2
Market basket:		
Total number of products	[1] 110	127
Total number of items	[2] 173	183

[1] The total number of national brand items equals the total number of products carried in the market baskets. With the exception of health and beauty aid products the number and type of products included in the market baskets for each firm were identical.

[2] The number of national brand items plus private label items equals the total number of items included in the market baskets. In all cases, private label items have national brand counterparts and hence do not represent additional products.

APPENDIX TABLE B.2.—PRODUCT CATEGORIES REPRESENTED AND NOT REPRESENTED IN MARKET BASKETS, AND EXPENDITURE WEIGHTS USED

Product categories represented	Expenditures in supermarkets (percent)	Weights in market basket	Product categories not represented	Expenditures in supermarkets (percent)
Frozen foods	6.10	(5.43)	Meat	22.73
Dairy	11.83	(5.36)	Produce	7.33
Grocery (by subgroups):			Grocery:	
Canned fruit, vegetables, juices, and drinks	3.83	(2.85)	Bakery products	6.26
Canned meat and fish, prepared foods and tomato products	2.84	(2.02)	Dried fruit	.15
Cold and hot cereals	1.55	(1.48)	Beer	2.85
Pasta and dried vegetable products	1.09	(.86)	Wine	.26
Coffee, tea, and soft drinks	4.93	(4.65)	Liquor	.54
Baking needs	3.73	(2.53)	Pickels/olives/relishes	.55
Syrups and spreads	2.72	(1.77)	Candy and gum	1.24
Baby products and condensed milk products	.87	(.52)	Nuts	.36
Pet food	2.07	(1.80)	Dietetic/low calory	.26
Household cleaning products	3.34	(3.34)	Tobacco	4.62
Paper and foil products	2.49	(1.78)	Housewares	1.13
			Soft goods	.39
			Waxes and polishes	.21
			Miscellaneous household supplies	.21
			Magazines/stationery/school supplies/miscellaneous	.42
Total grocery	29.46	(23.60)	Total grocery	19.45
Health and beauty aid items	3.09	(2.92)		
Total represented	50.48	(37.31)	Total unrepresented	49.51

Source: Chain Store Age, "Supermarkets," vol. 51, No. 7, July 1975.

[9] There were no firm sales data for estimating "hard" market shares in the Raleigh-Durham SMSA. In this and all other cases where no "hard" data were available, the market shares shown in the tables were the same as those used in the regression analysis and/or the monopoly overcharge estimates.

APPENDIX TABLE B.3.—MARKET BASKET OF 127 PRODUCTS AND THEIR WEIGHTS USED IN THE PRICE ANALYSIS

Products	National brand	Size	National brand weight	Private label weight	Expenditure weight
FROZEN FOODS					
Strawberries		16 oz		(*)	0.09
Orange juice	Minute Maid	12 oz	0.20	0.80	.76
Grape juice	Welch	12 oz	.80	.20	.03
Green beans, cut	Bird's-Eye	9 oz	.21	.79	.27
Corn niblets	Green Giant	10 oz	(*)	----------	.39
Green peas	Bird's-Eye	10 oz	.19	.81	.42
French fries		16 oz		(*)	.33
Chicken dinner	Swanson	11.5 oz	(*)	----------	2.06
Pound cake	Sara Lee	11.25 oz	(*)	----------	.96
DAIRY					
Butter	Land-O-Lakes	1 lb	.40	.60	.69
Velvetta cheese	Kraft	2 lb	(*)	----------	1.16
Cream cheese	Philadelphia	8 oz	.50	.50	.82
Ice cream		0.5 gal		(*)	1.55
Cool whip	Bird's-Eye	9 oz	(*)	----------	.04
Margarine, quarters	Blue Bonnet	1 lb	.82	.18	.83
Corn oil margarine	Fleischman	1 lb	.82	.18	.27
GROCERY					
Canned fruit, vegetable, juice and drinks:					
Fruit cocktail	Del Monte	17 oz	.51	.49	.12
Applesauce	Mott's	16 oz	.55	.45	.15
Yellow cling peaches, halves	Del Monte	16 oz	.54	.46	.18
Pear halves	do	16 oz	.46	.54	.10
Pineapple chunk, natural juice	Dole	20 oz	.51	.49	.12
Pork and beans	Van Camp's	16 oz	.69	.31	.20
Green beans, cut	Del Monte	16 oz	.70	.30	.40
W.K. corn	do	17 oz	.70	.30	.26
Green peas	do	17 oz	.68	.32	.22
Orange juice	Treesweet	46 oz	.80	.20	.14
Prune juice	Sunsweet	32 oz	.80	.30	.38
Tomato juice	Libby	46 oz	.62	.38	.17
Orange drink	Tang	27 oz	.80	.20	.05
Fruit drink, flavored	Hi-C	46 oz	(*)	----------	.27
Grape drink	Welchade	46 oz	.80	.20	.09
Canned meat and fish, prepared food and tomato products:					
Tomato sauce	Hunt	15 oz	.33	.67	.18
Tomato paste	do	6 oz	.33	.67	.13
Beef stew	Dinty Moore	24 oz	.99	.01	.11
Spam	Hormel	12 oz	(*)	----------	.13
Spaghetti	Franco-American	15 oz	(*)	----------	.18
Chunk lite tuna	Starkist	6.5 oz	.69	.31	.69
Tomato soup	Campbell's	10.75 oz	.90	.10	.51
Vienna sausage	Armour	5 oz	(*)	----------	.07
Potted meat	do	3.5 oz	(*)	----------	.01
Deviled ham	Underwood	4.5 oz	(*)	----------	.01
Cold and hot cereals:					
Corn flakes	Kellogg's	18 oz	.80	.20	.27
Cheerios	General Mills	15 oz	(*)	----------	.27
Rice krispies	Kellogg's	13 oz	(*)	----------	.23
100% natural cereal	Quaker	16 oz	(*)	----------	.31
Oats, quick	do	18 oz	.85	.15	.17
Instant breakfast	Carnation	6 envl	.95	.05	.23
Pasta and dried vegetable products:					
Elbow macaroni	Mueller	16 oz	(*)	----------	.18
Spaghetti, thin	do	16 oz	(*)	----------	.16
Macaroni and cheese dinner	Kraft	7.25 oz	(*)	----------	.09
Hamburger helper	Betty Crocker	7–8.5 oz	(*)	----------	.06
Cheese pizza mix	Chef Boy-Ar-Dee	15.8 oz	(*)	----------	.02
Instant rice	Minute	14 oz	.85	.15	.25
Hungry Jack Instant Potatoes	Pillsbury	16 oz	(*)	----------	.10
Coffee, tea and soft drinks:					
Coffee, regular	Maxwell House	2 lb	.84	.16	1.09
Coffee, instant	do	10 oz	.97	.03	.30
Instant coffee	Sanka	4 oz	(*)	----------	.12
Instant tea	Lipton	3 oz	.97	.03	.12
Tea bags	do	48 ct	.84	.16	.22
Cola	Shasta	12 oz	.95	.05	2.80

APPENDIX TABLE B.3.—MARKET BASKET OF 127 PRODUCTS AND THEIR WEIGHTS USED IN THE PRICE ANALYSIS—Continued

Products	National brand	Size	National brand weight	Private labe weight	Expenditure weight
GROCERY—Continued					
Baking Needs:					
Flour	Gold Medal	5 lb	.88	.12	.05
B. M. Bisquik mix	Bisquick	40 oz	.88	.12	.13
B. M. pancake mix	Aunt Jemima	32 oz	.88	.12	.10
Corn muffin mix	Jiffy	8.5 oz	(*)		.10
Cake mix	Duncan Hines	18.5 oz	.94	.06	.29
Sugar, granulated	Domino	5 lb	.20	.80	.94
10X powdered sugar	do	16 oz	.20	.80	.05
Oil	Crisco	24 oz	.76	.24	.40
Corn oil	Mazola	32 oz	(*)		.20
Shortening	Crisco	3 lb	.76	.24	.20
Salt	Morton	26 oz	(*)		.05
Semisweet morsels	Nestle's	12 oz	(*)		.02
Sirups and spreads:					
Peanut butter	Skippy	12 oz	.80	.20	.29
Grape jelly	Welch	20 oz	.80	.20	.17
Corn sirup	Karo	16 oz	(*)		.01
Maple flavored sirup	Log Cabin	12 oz	(*)		.18
Chocolate sirup	Hershey	16 oz	(*)		.03
Jello-O gelatin	Jell-O	6 oz	(*)		.13
Mayonnaise	Hellman's	32 oz	.90	.10	.29
Miracle whip	Kraft	16 oz	.90	.10	.13
French dressing	do	16 oz	.90	.10	.23
Catsup	Heinz	14 oz	.88	.12	.14
Spaghetti sauce	Ragu	15 oz	(*)		.17
Baby Products and condensed milk product:					
Baby product	Gerber	4.5 oz	(*)		.06
Baby cereal	do	8 oz	(*)		.01
Baby juice	do	4.2 oz	(*)		.04
Nonfat dry milk	Carnation	20 qt	.70	.30	.19
Evaporated milk	do	13 oz	.70	.30	.13
Nondairy creamer	Coffee Mate	16 oz	.80	.20	.09
Pet Food:					
Dog chow	Purina	25 lb	.93	.07	.32
Beef chunks	Alpo	14.5 oz	.93	.07	.60
Dog food, burgers	Ken-L-Ration	72 oz	.97	.03	.24
Cat chow	Purina	4 lb	(*)		.17
Cat food, fish flavor	Puss-n-Boots	15.25 oz	(*)		.47
Household Cleaning Products:					
Bleach	Clorox	0.5 gal	.80	.20	.21
Dry bleach	Clorox II	40 oz	.97	.03	.08
Cleanser	Comet	14 oz	.96	.04	.12
Cleaning product	Spic-n-Span	16 oz	(*)		.19
Fabric softener	Downy	64 oz	.90	.10	.26
Laundry detergent	Tide	84 oz	.98	.02	1.01
Liquid detergent	Ivory	22 oz	.98	.02	.33
Dishwasher detergent	Cascade	35 oz	.98	.02	.16
Bath soap	Dial	3.5 oz	.98	.02	.38
Scouring pads	S.O.S	10 ct	(*)		.19
Paper & Foil Products:					
Trash can liners	Glad	20 ct	.75	.25	.34
Aluminum foil	Reynolds	75 sq. ft	.75	.25	.17
Wax paper	Cutrite	125 ft	(*)		.02
Facial tissues	Kleenex	200's	.88	.12	.27
Paper towels	Bounty	Jumbo	.94	.06	.48
Toilet tissue	Lady Scott	2's-500	(*)		.50
HEALTH AND BEAUTY AID ITEMS					
Shampoo, concentrated	Prell	5 oz	(*)		.04
Liquid shampoo	Breck	7 oz	(*)		.27
Hairspray	Adorn	13 oz	(*)		.21
Toothpaste	Close-up	6.4 oz	(*)		.30
Mouthwash	Scope	12 oz	(*)		.17
Deodorant	Right Guard	7 oz	(*)		.50
Antacids	Alka-Seltzer	25's	(*)		.16
Cold medication, Nyquil	Vicks	6 oz	(*)		.15
Vitamins with/iron	One-A-Day	100's	(*)		.08
Trac II razor blades	Gillette	9's	(*)		.22
Aspirin	Anacin	100's	(*)		.29
Skin bracer	Mennen	6 oz	(*)		.05
Baby powder	J & J	9 oz	(*(		.04
Swabs	Q-Tips	88's	(*)		.03
Skin cream	Noxzema	6 oz	(*)		.14
"Day" disposable diapers	Pampers	30's	.90	.10	.18
"Nite" disposable diapers	do	12's	.90	.10	.18

Source: Company data provided to the Joint Economic Committee; Chain Store Age, "Supermarkets," vol. 51, No. 7, July 1975; Selling Areas Marketing, Inc.; NCFM Technical Study, No. 10.

APPENDIX TABLE B.4.—COST OF GROCERY BASKETS AND PRIVATE LABEL-NATIONAL BRAND GROCERY BASKET RATIOS FOR 3 FIRMS IN 17 SMSAs NOT INCLUDED IN FIGS. 3.1 AND 3.2 OR APPENDIX TABLES B.5 AND B.6

Company—SMSA	Weighted grocery basket (weighted dollar)	Private label-national brand ratios (percent)
Firm K:		
City aa	93.09	88
City bb	93.09	88
City cc	95.67	87
Firm H:		
City dd	94.57	92
City ee	91.22	91
City x	97.03	93
City ff	93.64	92
City gg	91.82	94
City y	85.76	96
City hh	95.29	93
City ii	96.77	91
City jj	94.57	92
City kk	94.57	92
Firm D:		
City dd	91.94	89
City s	93.34	88
City jj	91.86	89
City ll	91.18	90

Source: Company data provided to the Joint Economic Committee.

APPENDIX TABLE B.5.—FIRM K: PRIVATE LABEL PRICES RELATIVE TO NATIONAL BRAND PRICES WEIGHTED BY EXPENDITURE WEIGHTS, BY MAJOR GROUP, AND BY MARKET BASKET, 7 SMSAs

SMSA	Major groups			Market basket [a]
	Frozen foods	Dairy	Grocery	
City b	81	86	88	87
City f	80	81	82	82
City g	80	90	87	87
City h	85	88	88	87
City i	79	90	84	85
City j	87	92	90	90
City a	78	86	86	86
Mean	81	88	86	86

[a] The private label-national brand ratios for the market basket were calculated by dividing the sum of private label prices across major groups by the sum of national brand prices. A total of 63 national brand items and their private label counterparts were included in this market basket (126 in total). This compared to 173 items in the overall market basket for firm K. The mean for the 3 major groups for any 1 SMSA will not necessarily equal the mean for the market basket as calculated above. Due to some items having relatively higher prices than other items, this procedure does reflect a bias toward the ratios of high priced items.

Source: Company data provided to the Joint Economic Committee.

APPENDIX TABLE B.6.—FIRM H: PRIVATE LABEL PRICES RELATIVE TO NATIONAL BRAND PRICES WEIGHTED BY EXPENDITURE WEIGHTS, BY MAJOR GROUPS AND BY MARKET BASKET, 15 SMSAs

[In percent]

SMSA	Major groups				Market [a] basket
	Frozen food	Dairy	Grocery	Health and beauty aids	
City e	82	91	91	91	91
City k	76	90	91	86	90
City l	77	90	92	----------	[b] 91
City m	81	95	92	91	92
City n	90	90	92	86	91
City c	76	94	91	91	91
City o	86	89	92	91	91
City p	85	88	93	87	92
City q	87	88	93	92	92
City r	78	92	93	91	92
City s	77	95	94	92	94
City t	90	88	93	----------	[b] 92
City u	85	90	94	76	92
City v	80	96	93	91	93
City d	79	97	93	95	93
Mean	82	92	92	89	[b] 92

[a] The private label-national brand ratios for the market basket were calculated by dividing the sum of private label prices across major groups by the sum of national brand prices. A total of 56 national brand items and their private label counterparts were included in this market basket (112 in total). This compared to 183 items in the overall market basket for firm H shown in table 3.2. The mean for the 3 major groups for any 1 SMSA will not necessarily equal the mean for the market basket as calculated above. Due to some items having relatively higher prices than other items, this procedure does reflect a bias toward the ratios of high priced items.

[b] The market basket private label-national brand ratios for city t and city l were calculated on a smaller number of observations due to missing health and beauty aid observations.

Source: Company data provided to the Joint Economic Committee.

APPENDIX TABLE B.7.—PRIVATE LABEL PRICES AS A PERCENT OF NATIONAL BRAND PRICES IN DIFFERENT PRODUCT GROUPS, UNWEIGHTED, 2 GROCERY CHAINS, 1974

Grocery products	Firm H [1]		Firm K [2]	
	Number of items	Private label as percent of national brand prices	Number of items	Private label as percent of national brand prices
Canned fruits and vegetables	13	92.1	14	89.5
Canned meat and prepared foods	5	92.8	5	89.7
Cereals and instant breakfast	2	93.3	3	87.6
Pasta and dried vegetables	1	89.5	1	90.9
Coffee, Tea, and soft drinks	2	97.3	5	87.9
Baking needs	8	92.0	6	91.2
Sirups and spreads	3	90.8	6	88.9
Baby products and condensed milk	2	94.8	3	88.8
Pet foods	3	87.0	3	79.0
Cleaning products	4	84.7	8	77.2
Paper products	3	91.9	3	89.0
Grocery total	46	91.5	57	87.3
Health and beauty aids	2	89.9	----------	----------
Frozen foods	4	88.1	3	88.3
Dairy	4	91.1	3	87.2

[1] Private label-national brand price relationships are the mean of the relationships found in 16 SMSA's.
[2] Private label-national brand price relationships are the mean of the relationships found in 10 SMSA's.

Source: Company data provided to the Joint Economic Committee.

APPENDIX TABLE B.8.—MATRIX OF SIMPLE CORRELATION COEFFICIENTS BETWEEN THE VARIABLES USED IN REGRESSION ANALYSIS OF GROCERY PRICE, 1974

	Cost of grocery basket (C)	Relative firm market share (RFMS)	4-firm concentration (CR_4)	Mean store size (SS)	Market growth (MG)	Market size (MS)	Market rivalry (MR)	Firm market share (FMS)
C	1.000	0.476	0.239	−0.052	−0.206	−0.085	−0.522	0.455
RFMS		1.000	0.200	0.313	−0.173	0.093	−0.155	0.918
CR_4			1.000	0.482	0.156	−0.037	0.273	0.545
SS				1.000	−0.319	0.588	0.310	0.468
MG					1.000	−0.231	−0.147	−0.059
MS						1.000	−0.102	0.088
MR							1.000	−0.016
FMS								1.000

APPENDIX TABLE B.9.—MULTIPLE REGRESSION EQUATIONS EXPLAINING COST OF A GROCERY BASKET OF 3 CHAINS IN 36 SMSAs, 1972 [a]

Dependent variable [b]	Intercept	Relative firm-market share (RFMS)	Curvilinear relative firm-market share (CRFMS) [c]	4-firm concentration (CR_4)	Curvilinear 4-firm concentration (CCR_4) [c]	Mean store size (SS)	Market growth (MG)	Market size (MS)	Market rivalry (MR)	$\bar{R}^2$	F-value
a—NPC	87.81	5.094		11.699			−0.079			0.26	**5.10
		†(1.678)		*(2.408)			*(−1.982)				
b—NPC	89.28	4.038		12.932			−.088		−0.433	.55	**11.57
		†(1.692)		**(3.393)			**(−2.808)		**(−4.612)		
1a—NPC	89.51	9.027		10.995		−0.005				.29	**5.69
		**(3.003)		*(2.407)		*(−2.294)					
1b—NPC	90.11	7.296		17.973		−.007	−.113			.44	**7.90
		**(2.684)		**(3.893)		**(−3.366)	**(−3.133)				
1c—NPC	90.45	5.627		16.662		−.004	−.108		−.351	.60	**11.72
		*(2.417)		**(4.275)		*(−2.351)	**(−3.542)		**(−3.725)		
1d—NPC	90.42	5.240		15.073		−.002	−.111	−0.903	−.405	.61	**10.06
		*(2.236)		**(3.652)		(−.843)	**(−3.639)	(−1.128)	**(−3.845)		
1e—NPC	90.11	4.636		13.294			−.107	−1.386	−.455	.61	**12.05
		*(2.088)		**(3.766)			**(−3.575)	*(−2.490)	**(−5.207)		
1f—NPC	95.61	4.552			6.652		−.112	−1.592	−.463	.62	**12.39
		*(2.066)			**(3.874)		**(−3.716)	**(−2.862)	**(−5.337)		
1g—NPC	96.00		2.433		6.250		−.109	−1.536	−.460	.62	**12.62
			*(2.168)		**(3.535)		**(−3.613)	**(−2.787)	**(−5.332)		
2c—NC	90.41	5.149		13.555			−.095	−.842	−.474	.63	**13.00
		*(2.356)		**(3.902)			**(−3.236)	(−1.537)	**(−5.512)		
2g—NC	96.42		2.813		6.349		−.097	−.996	−.478	.66	**14.41
			**(2.600)		**(3.723)		**(−3.328)	†(−1.875)	**(−5.748)		

[a] See footnote (1), table 3.3.
[b] See footnote (2), table 3.3.
[c] See footnote (3), table 3.3.

Note: Figures in parenthesis are t-values. The statistical significance of the regression coefficients for RFMS, CRFMS, CR_4, CCR_4, SS and MR were tested by means of a 1-tailed t-test; MG and MS were tested by means of a 2-tailed t-test. The adjusted coefficients of multiple determination were tested by means of F-ratio. †, * and ** indicate the regression coefficients are statistically significant at the 10, 5, and 1 percent levels, respectively.

APPENDIX TABLE B.10.—CORRELATION MATRIX FOR REGRESSION EQUATIONS DISPLAYED IN TABLE 2.6

	Avg. P/S 1970–74	P/S 1970	P/S 1971	P/S 1972	P/S 1973	P/S 1974	RFMS	CR_4	CCR_4	FG	LNFG	MG	MG_2	MS	MS_2	APC	API
Avg. P/S 1970–74	1																
1970 P/S	.902	1															
1971 P/S	.927	.944	1														
1972 P/S	.934	.863	.901	1													
1973 P/S	.854	.606	.633	.688	1												
1974 P/S	.852	.614	.650	.672	.928	1											
RFMS	.574	.520	.511	.524	.518	.495	1										
CR_4	.111	.111	.188	.206	.097	.147	.012	1									
CCR_4	.169	.129	.206	.200	.080	.124	−.013	.824	1								
FG	.605	.470	.481	.577	.596	.574	.083	.112	.136	1							
LNFG	.632	.469	.497	.598	.631	.626	.157	.148	.146	.969	1						
MG	.446	.427	.465	.471	.291	.320	.071	.292	.170	.268	.285	1					
MG_2	.401	.392	.399	.413	.280	.296	.042	.273	.152	.278	.286	.961	1				
MS	−.133	−.091	−.176	−.136	−.009	−.119	−.070	−.122	−.245	.040	.031	−.308	−.248	1			
MS_2	−.084	−.030	−.125	−.103	−.025	−.086	−.045	−.188	−.323	.045	.041	−.308	−.245	.963	1		
APC	−.517	−.437	−.459	−.615	−.379	−.365	−.299	−.112	−.018	−.385	−.336	−.198	−.187	−.055	−.038	1	
API	−.283	−.215	−.218	−.340	−.226	−.238	−.207	−.029	.102	−.244	−.273	−.329	−.284	.012	−.015	.347	1

APPENDX TABLE B.11.—CORRELATION MATRIX FOR REGRESSION EQUATIONS DISPLAYED IN TABLE 2.7

	Avg. P/S 1970–74	P/S 1970	P/S 1971	P/S 1972	P/S 1973	P/S 1974	RFMS	CR_4	CCR_4	FG	LNFG	MG	MG_2	MS	MS_2	API
Avg. P/S 1970–74	1															
1970 P/S	.902	1														
1971 P/S	.927	.911	1													
1972 P/S	.959	.813	.858	1												
1973 P/S	.948	.768	.792	.917	1											
1974 P/S	.933	.762	.795	.869	.924	1										
RFMS	.496	.460	.461	.510	.464	.416	1									
CR_4	.163	.069	.186	.178	.136	.186	.049	1								
CCR_4	.294	.217	.326	.278	.255	.299	.117	.825	1							
FG	.597	.482	.475	.590	.627	.596	−.040	.080	.161	1						
LNFG		.503	.524	.603	.689	.678	.069	.125	.170	.971	1					
MG	.417	.379	.398	.425	.376	.367	.036	.272	.169	.237	.264	1				
MG_2	.384	.379	.349	.389	.349	.329	−.001	.261	.166	.246	.261	.965	1			
MS	−.252	−.203	−.283	−.219	−.198	−.285	−.220	−.107	−.186	.024	.015	−.354	−.282	1		
MS_2	−.188	−.129	−.220	−.164	−.140	−.230	−.202	−.166	−.254	.040	.036	−.354	−.279	.965	1	
API	−.150	−.100	−.089	−.215	−.129	−.150	−.128	.012	−.133	−.128	−.177	−.316	−.257	.039	−.003	1

APPENDIX TABLE B.12.—CORRELATION MATRIX FOR REGRESSION EQUATIONS DISPLAYED IN TABLE 2.8

	Avg. P/S 1970–74	P/S 1970	P/S 1971	P/S 1972	P/S 1973	P/S 1974	RFMS	CR_4	CCR_4	SS	E	FG	LNFG	MG	MG_2	MS	MS_2	API
Avg. P/S 1970–74	1																	
1970 P/S	.783	1																
1971 P/S	.861	.710	1															
1972 P/S	.919	.582	.736	1														
1973 P/S	.879	.469	.635	.863	1													
1974 P/S	.793	.354	.501	.784	.902	1												
RFMS	.506	.548	.515	.391	.313	.277	1											
CR_4	.227	.175	.208	.176	.161	.232	.196	1										
CCR_4	.270	.288	.279	.158	.154	.208	.240	.883	1									
SS	−.156	−.111	−.250	−.142	−.108	−.026	−.171	.246	.097	1								
E	−.386	−.557	−.448	−.253	−.134	−.056	−.437	.178	.002	.245	1							
FG	.387	.123	.137	.446	.518	.545	−.026	.161	.123	.146	.312	1						
LNFG	.442	.094	.185	.518	.605	.635	−.192	.176	.113	.151	.289	.962	1					
MG	.352	.177	.307	.444	.331	.283	−.049	.248	.158	−.069	.129	.345	.343	1				
MG_2	.352	.211	.303	.410	.330	.271	−.026	.279	.155	−.046	.073	.304	.303	.935	1			
MS	−.141	−.182	−.206	−.055	−.046	−.050	−.193	−.320	−.520	.318	−.002	.021	.062	−.344	−.262	1		
MS_2	.087	−.119	−.160	−.021	.006	−.028	−.209	−.346	−.560	.293	−.062	.014	.049	−.362	−.267	.967	1	
API	−.125	−.154	−.007	−.176	−.103	−.081	.062	.074	.080	−.481	−.112	−.457	−.434	−.228	−.171	−.216	−.195	1

APPENDIX TABLE B.13.—MULTIPLE REGRESSION EQUATIONS EXPLAINING PROFIT-SALES RATIOS FOR 28 DIVISIONS OF THE A&P CO.

Dependent variable profit sales ratio	Intercept	Independent variables: Relative firm-market share (RFMS)	Curvilinear 4-firm concentration (CCR_4)	Market growth squared (MG_2)	Market size (MS)	Market size squared (MS_2)	R_2	F value
1a. 1970–74 average	−7.875	0.135	5.299	0.108	−1.265	0.297	0.526	**4.88
		**(4.190)	(1.214)	*(2.049)	(.965)	(.749)		
1b. 1970–72	−15.598	.166	13.002	.203	−2,629	.698	.538	**5.12
		**(3.760)	*(2.167)	**(2.797)	†(1.459)	(1.277)		
1c. 1973–74	3.710	.088	−6.256	.034	.781	−.305	.287	1.77
		*(1.925)	(1.013)	(.454)	(.421)	(.542)		
2. 1970	−14.237	.168	12.724	.176	−2.694	.820	.529	**4.95
		**(3.834)	*(2.147)	**(2.450)	†(1.514)	†(1.519)		
3. 1971	−12.094	.155	10.038	.210	−2.414	.614	.533	**5.03
		**(3.604)	†(1.717)	**(2.972)	†(1.375)	(1.154)		
4. 1972	−20.465	.176	16.244	.223	−2.779	.660	.509	**4.56
		**(3.399)	*(2.312)	*(2.265)	(1.317)	(1.032)		
5. 1973	4.903	.082	−7.593	−.072	.053	−.120	.274	1.66
		†(1.602)	(1.090)	(.859)	(.025)	(.189)		
6. 1974	2.516	.093	−4.919	.005	1.510	.490	.302	1.91
		*(2.212)	(.863)	(.066)	(.884)	(.943)		

Note: Significance levels: **=1 percent; *= percent; 5 †=10 percent.

APPENDIX TABLE B.14.—MULTIPLE REGRESSION EQUATIONS EXPLAINING PROFIT-SALES RATIOS FOR 50 DIVISIONS OF THE 11 COMPANIES THAT ARE IN DIRECT COMPETITION WITH A&P [a]

Dependent variable/ profit sales ratio	Intercept	Independent variables: Relative firm market share (RFMS)	Curvilinear 4-firm concentration (CCR_4)	Log firm growth (LNFG)	Market growth (MG)	Market size (MS)	Market size squared (MS_2)	R_2	F value
1. 1970–74 average	−7.860	0.065	3.300	1.541	0.061	−1.556	0.449	0.909	**60.98
		**(5.318)	†(1.624)	**(7.328)	**(3.195)	*(2.085)	*(2.084)		
2. 1970	−4.720	.062	2.272	1.091	.069	−1.973	.616	.865	**39.48
		**(3.822)	(.861)	**(3.884)	**(2.656)	*(2.015)	*(2.169)		
3. 1971	−6.338	.047	3.740	1.215	.067	−1.627	.462	.884	**46.56
		**(3.189	†(1.511)	**(4.745)	**(2.898)	*(1.789)	*(1.762)		
4. 1972	−9.693	.084	3.442	1.639	.088	−1.310	.416	.816	**27.31
		**(5.395)	†(1.367)	**(6.113)	**(3.498)	†(1.403)	†(1.533)		
5. 1973	−9.994	.082	3.170	1.963	.048	−1.814	.493	.860	**37.61
		**(6.174)	†(1.465)	**(8.507)	*(2.222)	*(2.257)	*(2.115)		
6. 1974	−7.824	.057	3.201	1.742	.031	−1.347	.294	.877	**43.59
		**(4.219)	†(1.501)	**(7.482)	†(1.370)	†(1.683)	(1.262)		

[a] All are weighted regressions.

Note: Significance levels: **=1 percent; *=5 percent; †=10 percent.

APPENDIX TABLE B.15.—COMPARISON OF MARKET STRUCTURE-PROFIT MODELS USING GROCERY STORE, SUPERMARKET AND HERFINDAHL MEASURES OF CONCENTRATION AND RELATIVE MARKET SHARE, 1972 [a]

Dependent variable/ profit sales ratio	Intercept	Grocery store relative firm market share (RFMS)	Grocery store 4-firm concentration (CR_4)	Grocery store curvilinear 4-firm concentration (CCR_4)	Mean store size (SS)	Entry (E)	Firm growth (FG)	Log firm growth (LNFG)	Market growth (MG)	Market growth squared (MG_2)	Market size (MS)	Market size squared (MS_2)	A&P impact (API)	R_2	F value
1970–74 average [b]	−3.185	0.065	0.024		−0.949	−0.042	0.046		0.033		0.264			0.808	**33.13
		**(5.884)	†(1.665)		†(−1.526)	**(−5.220)	**(7.086)		**(3.043)		†(1.375)				
1970–74 average [b]	−.194	.065		3.029	−.503	−.032		1.729		0.049	−1.806	0.576	0.396	.858	**36.74
		**(6.632)		*(2.100)	(−.796)	**(−4.541)		**(7.780)		**(3.371)	**(−2.998)	**(3.375)	†(1.315)		
		Supermarket relative firm market share (SRFMS)	Supermarket 4-firm concentration (SCR_4)	Supermarket curvilinear 4-firm concentration ($SCCR_4$)											
1970–74 average [b]	−3.595	.065	.020		−.591	−.042	.047		.033		.264			.807	**33.00
		**(5.902)	*(1.710)		(−1.013)	**(−5.188)	**(7.120)		**(3.065)		†(1.381)				
1970–74 average [b]	−5.463	.067		7.721	.110	−.034		1.780		.049	−2.033	.672	.407	.856	**36.20
		**(6.808)		*(2.044)	(.185)	(−4.731)		**(8.161)		**(3.381)	**(−3.258)	**(3.552)	†(1.361)		
1970–74 average [b]	−5.266	.067		7.623		−.034		1.781		.049	−2.013	.667	.390	.857	**41.43
		**(6.873)		*(2.059)		**(−4.919)		**(8.276)		**(3.416)	**(−3.282)	**(3.573)	†(1.458)		
		Supermarket relative firm market share (SRFMS)	Supermarket relative Herfindahl [c] (SRHERF)	Supermarket Herfindahl [c] (SHERF)											
1970–74 average [d]	−2.947	.066		.016		−.042	.046		.034		.103			.793	**34.52
		**(5.842)		(.659)		**(−5.103)	**(6.876)		**(3.021)		(.562)				
1970–74 average [d]	2.591		.041	.019		−.042		1.672		.050	−1.870	.505	.371	.823	**31.54
			**(5.834)	(.779)		**(−5.377)		**(7.486)		**(2.985)	**(−2.933)	**(2.884)	(1.274)		
1970–74 average [d]	1.945	.065		.019		−.035		1.746		.046	−1.924	.541	.438	.844	**36.78
		**(6.324)		(.855)		**(−4.575)		**(8.002)		**(2.966)	**(−3.120)	**(3.187)	†(1.593)		

[a] The units in which variables are expressed are summarized in footnote (1), table 2.6, and footnote (2), table 2.8.

[b] One observation was deleted from the original 72 observations used in the multiple regression analysis summarized in table 2.8. Additional information received after the original analyses was conducted provided strong evidence that the census estimated CR_4, SCR_4, and Herfindahls were in error. Exclusion of the observation did not materially alter the results shown in table 2.8.

[c] $SHERF = \sum_{i=1}^{N} SMS_i^2$.

[d] 2 observations were deleted because census Herfindahls were judged in error but could not be recalculated.

[c] $SRHERF = SMS^2/HERF_4$; where SMS is a firm's share of total supermarket sales in an SMSA and $HERF_4$ is the sum of the leading 4 firm's supermarket market shares squared $\left(\text{i.e. } \sum_{i=1}^{4} SMS_i^2\right)$.

Note: Significance levels: **=1 percent; *=5 percent; †=10 percent. A 1-tail test is applied to all coefficients except the coefficients for RFMS in equations 1b., 2b., and 3b. In these cases a 2-tai test is applied.

APPENDIX TABLE B.16.—COMPARISON OF MARKET STRUCTURE-PRICE MODELS USING GROCERY STORE, SUPERMARKET AND HERFINDAHL MEASURES OF CONCENTRATION AND RELATIVE MARKET SHARE, 1972 [a]

Dependent variable	Intercept	Grocery store relative firm market share (RFMS)	Grocery store 4-firm concentration (CR_4)	Mean store size (SS)	Market growth (MG)	Market size (MS)	Market rivalry (MR)	$\bar{R}_2$	F value
NPC	89.28	4.038	12.932		−0.088		−0.433	.55	**11.57
		+(1.692)	**(3.393)		**(−2.808)		**(−4.612)		
Do	90.45	5.627	16.662	−0.004	−.108		−.351	.60	**11.72
		*(2.417)	**(4.275)	*(−2.351)	**1−3.542)		**(−3.725)		
Do	90.11	4.636	13.294		−.107	−1.386	−.455	.61	**12.05
		*(2.088)	**(3.766)		**(−3.575)	*(−2.490)	**(−5.207)		
		Supermarket relative firm market share (SRFMS)	Supermarket 4-firm concentration (SCR_4)						
Do	87.14	4.801	13.037		−.112		−.379	.61	**14.53
		*(2.257)	**(4.263)		**(−3.612)		**(4.324)		
Do	87.74	5.347	13.047	−.001	−.114		−.358	.60	**11.46
		*(2.299)	**(4.223)	(−.614)	**(−3.616)		**(−3.763)		
Do	88.20	5.317	12.134		−.118	−.842	−.393	.62	**12.55
		**(2.517)	**(3.970)		**(−3.854)	(−1.508)	**(−4.554)		
		Supermarket relative Herfindahl [b] (SRHERF)	Supermarket total market Herfindahl [d] (SHERF)						
NPC [c]	93.86	3.635	15.132	−.001	−.082		−.408	.49	**7.59
		*(2.075)	*(2.431)	(−.463)	*(−2.354)		**(−3.722)		
NPC [c]	94.36	3.665	13.926		−.095	−1.180	−.445	.54	*9.14
		*(2.400)	*(2.353)		**(−2.821)	*(−1.900)	**(−4.608)		

[a] See footnotes at the bottom of app. table B.9.

[b] $SRHERF = SMS^2/HERF_4$; where SMS is a firm's share of total supermarket sales in an SMSA and $HERF_4$ is the sum of the leading 4 firms' supermarket market shares squared $\left(\text{i.e. } \sum_{i=1}^{N} SMS_i^2\right)$.

[c] 1 SMSA observation was omitted due to an inability to recalculate the Herfindahl index (see footnote 6, app. B).

[d] $SHERF = \sum_{i=1}^{N} SMS_i^2$

Appendix C. BLS RETAIL FOOD PRICE DATA

The Bureau of Labor Statistics currently publishes "Estimated Retail Food Prices By City", which provides monthly and annual food price information for 24 SMSAs. The data are collected primarily for use in measuring month-to-month changes in food prices as a component of the Consumer Price Index. The BLS warns that these data are not suitable for making comparisons of the level of food prices in different cities.[1] These data are not appropriate for making across-market price comparisons because of the data development procedures used by BLS. Particularly important are the procedures followed in selecting and weighting the items included in the food market basket and the outlets selected for price checking.[2]

Outlets Selected for BLS Price Checking

The food-at-home component of the Consumer Price Index is designed to measure changes in the food prices of all food retailing outlets. Thus, the outlets sampled are drawn from a population that includes convenience stores, meat markets, and other relatively low volume outlets as well as chain and independent supermarkets.

Firms with four or more stores that have combined sales of at least 1 percent of the market are included in the outlets selected on a certainty basis. "Other" food stores are partitioned into two subgroups, "large" stores with annual sales of $500,000 or greater and "small" stores with annual sales over $50,000 but less than $500,000. Outlets are chosen from these subgroups using a probability sampling procedure.

The average price of each item is calculated for each of the three stratum of outlets. The weighted average chain price is computed using each chain's share of chain store sales as weights. Unweighted average prices for each item are calculated for the "large store" and "small store" groups. The average item prices for the three groups of outlets are then combined through the use of commodity weights for each SMSA. Commodity weights are measures of the percent of meat, produce and dry grocery sales accounted for by each of the three stratum of outlets. For example, the commodity weights employed in city mm and city b are as follows:[3]

	Percent of sales		
	Meat	Produce	Dry grocery
City m m:			
Chain	36	38	47
Large independent	37	35	38
Small independent	27	27	15
City b:			
Chain	77	74	84
Large independent	8	7	5
Small Independent	15	19	11

The National Commission on Food Marketing found the average prices charged by small independents were significantly higher than the average prices

[1] Rothwell, Doris P. "Calculation of Average Retail Food Prices." Monthly Labor Review, January 1965, pp. 61–66. U.S. Department of Labor, Bureau of Labor Statistics, Estimated Retail Food Prices by City, Monthly Issues.

[2] Additional technical references are: BLS Handbook of Methods (BLS Bulletin 1711), Ch. 10. Retail Prices of Food 1964–1968 (BLS Bulletin 1632). E. D. Hoover and M. S. Statz, "Food Distribution Changes and the CPI," Monthly Labor Review, January 1964, pp. 58–64. H. M. Miller, "Revision of the CPI Food Outlet Sample." Monthly Labor Review, January 1968. pp. 54–59. National Commission of Food Marketing. Organization and Competition in Food Retailing, Technical Study No. 7, June 1966, Chapter 16.

[3] Miller, H. M., "Revision of the CPI Food Outlet Sample," op. cit., p. 58.

charged by chain stores.[4] To the extent that this continues to be true and assuming other things held constant, the above weighting procedure would tend to yield high average prices in weak chain markets such as city mm and relatively low prices in chain dominated markets such as city b. Insofar as the relative importance of chains is positively correlated with four firm concentration, there is a tendency for CR_4 and BLS food-at-home prices to be negatively correlated.

Selection of Market Basket Items

In the largest SMSAs, BLS price checks approximately 94 different items. Due to sampling procedures, the number of items priced in individual stores may be 54 to 59, or the full 94. Each item price checked is pre-specified with respect to type (e.g. cheese, American process), size (e.g. 8 oz.), container (e.g., carton), and quality where appropriate. The brand of each item sampled is not predetermined. Individual item brands selling in the greatest volume and meeting item specifications are selected during the initial visit of the BLS agent to each outlet. Changes in the brands price checked are periodically made if warranted by shifts in sales.

This procedure for selecting item brands results in private label products being priced in some outlets while national brands of the same items are priced in other outlets. This is an important source of distortion if comparisons are made across markets. For example, large chains generally place greater emphasis on private brands than do independent food stores. Since the brands selected in each outlet are based upon item volume, the chances are much greater for private brand items being selected in chains than in independent stores. If private brands are selected more frequently in chain stores, then the average chain store price would be expected to reflect the generally lower private label prices.

Given the procedure for weighting chain and independent food store prices discussed earlier, the average prices in markets with a high proportion of independents would tend to be higher than in strong chain markets due to the national brand-private label influence alone. To the extent that chains are more important in concentrated markets, the national brand-private label mix also tends to result in a negative relationship between average market prices and four-firm concentration.

Thus, if small independent stores and national brand products are generally higher in prices than large chain stores and private label products, the methodology of the Bureau of Labor Statistics results in a strong tendency for average market prices to be inversely related to market concentration.

This tendency in no way conflicts with the present study which found a strong positive relationship between market concentration and chain prices for all identical basket of items. The two sets of data were developed for different purposes and answer different questions. The BLS data are designed to estimate the changes in the actual expenditures for food of an average consumer in various metropolitan areas and throughout the U.S. The analysis in this report does not attempt to measure what consumers actually spend for food from all outlets in the SMSAs which were examined; rather, the focus is on the relationship between chain prices across various markets and the competitive structure of these markets.

If price were the only performance dimension of interest, these two data sets suggest that consumers would be best off in a market which was low in concentration but whose food needs were totally provided by several supermarket chains. Of course, price is not the only performance dimension of interest. Convenience of location, store services, friendly personnel and local ownership are also considered important by many consumers. These characteristics can often be provided best by independent stores of various size.

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[4] Organization and Competition in Food Retailing, op. cit., pp. 308–309.

Appendix D. A GENERALIZED MODEL OF STRUCTURE, CONDUCT, AND PERFORMANCE IN FOOD RETAILING

Considerable evidence has been brought to bear in this report on the relationship between market structure and two aspects of performance, the profit-sales ratio and prices. This appendix contains a simultaneous (i.e., joint) equation analysis of the profit-sales ratio, the advertising-sales ratio and the change in a firm's market share. A set of exogenous firm, market structure and control variables are specified to determine simultaneously the levels of these three endogenous variables. The basic hypothesis is that market structure not only determines dimensions of market conduct and performance but also that market conduct and performance feed back and determine market structure. A three equation structural model is estimated to test this hypothesis.

In "A Survey of Advertising and Market Structure," American Economic Association Papers and Procedings, May 1976, Gerard Butters makes the following criticism of single equation analysis: "A more fundamental objection to either the view that advertising creates profits or that it enhances competition is that the level of advertising expenditures should be considered to be an endogenous variable, jointly determined along with prices, quantities of production, and rates of return." (p. 393). This appendix is an attempt to answer this criticism.

Since only three firms provided both SMSA advertising and profit data, the sample used in this analysis has only 27 observations. Because of this, the analysis should be considered exploratory in nature and its findings tentative.

I. The Endogenous Relationship Between Rates of Profit, Advertising and Changes in Market Share

Consumer advertising is a pervasive marketing tool in market economies. Advertising that it is informative serves the valuable economic function of facilitating rational consumer choice. However, advertising that manipulates consumers' psyches or creates artificial distinction between identical products may be of negative value to consumer decision-making.

Edwin H. Chamberlain provided an economic rationale for noninformative advertising. He argued that if entry is restricted, an oligopolist can increase his profits by avoiding price competition and advertising to differentiate his product and enhancing its demand. In this case price does not equal marginal cost so there is a welfare loss.[1]

The loss in social welfare is accentuated in those cases where advertising significantly enhances the market power in an industry through increased product differentiation, concentration and barriers to entry. Over twenty years ago, Joe Bain theorized that manipulative advertising may create a product differentiation barrier to entry; real and/or pecuniary scale economies in advertisting also create barriers to entry. A few economists have followed Bain's theoretical lead and seen advertising as a dimension of market behavior[2] that not only has immediate implications for social welfare, but also has a feedback effect on market structure, and hence implications for future social welfare.[3] In this study,

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[1] See E. H. Chamberlain, The Theory of Monopolistic Competition, pp. 107–109.

[2] Market behavior is defined as a general category that encompasses market conduct and performance.

[3] Although several analyses have employed advertising as a surrogate of product differentiation and related advertising to market performance, relatively meager attention has been given to the theoretical and empirical relationships between advertising and market structure. There are probably two reasons for this. First, neo-classical theoreticians avoid sellers' costs which influence demand because they violate the assumption that supply and demand phenomena for commodities are independent of each other. This assumption is fundamental to the construction and meaning of supply and demand functions. Second, the quantity and usefulness of available data severely restrict empirical research.

we hypothesize that an increase in the advertising-sales rate, an endogenous dimension of behavior, feeds back to increase firm market share.[4]

Although firms are interested in enhancing their long-run earnings potential through advertising, it goes without challenge that they also value non-negative current profit levels. This suggests that there exists a trade-off between current profits and current advertising that may produce a market structure that permits higher future profits. We hypothesize that if the set of exogenous variables determines a low (high) profit-sales ratio, the latter endogenously determines a high (low) advertising-sales ratio. The converse of this hypothesis is a second hypothesis. Thus, the profit-sales and advertising-sales ratio are endogenous explanatory variables in each other's structural equation.

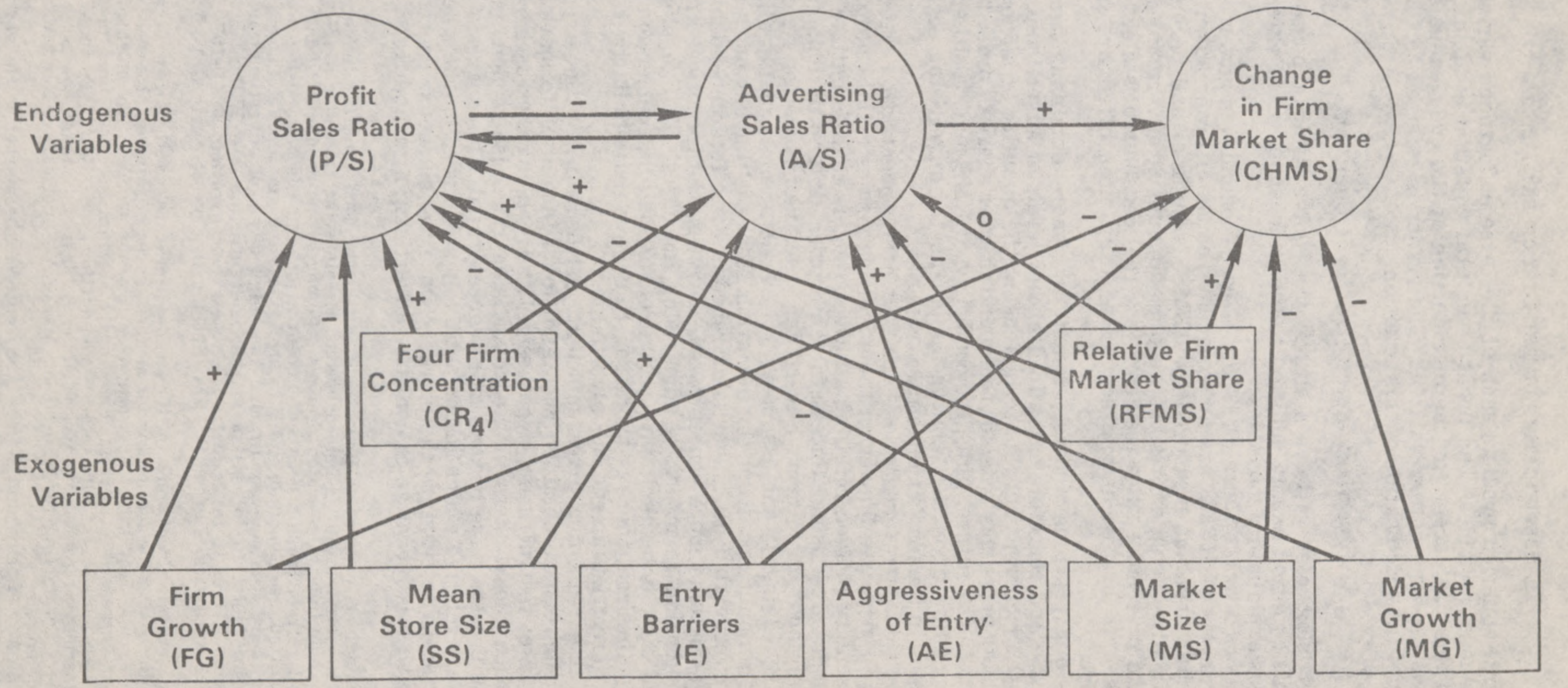
These hypotheses are indicated in Figure D.1 by the two arrows between the profit-sales and advertising-sales ratios. Each arrow represents the hypothesized relationship between two variables. The negative signs indicate the expected trade-off between these two endogenous variables. The arrow with a positive sign from advertising to change in firm market share indicates the hypothesized feedback effect from current behavior to market structure. The other signed arrows indicate the hypothesized exogenous relationships between the three endogenous variables and firm characteristics (FG, AE), market structure (RFMS, CR_4, SS, EB) and control variables (MS, MG). These relationships are presented in the following section.

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[4] There are three possible targets for restructuring: the change in sales, the change in firm market share and the chance in relative firm market share. They are highly correlated with each other in the population so choice of one over the other will not cause variation in the test results. Change in firm market share was chosen because it is a more direct target than change in relative firm market share which varies with changes in the concentration ratio, and because share of market is felt to be more of a determinant of competitive performance than a firm's absolute dollar sales.

Appendix Fig. D.1.

Flow Chart of a Three Equation System that Jointly Determines the Level of the Profit Sales Ratio, Advertising Sales Ratio and Change in Firm Market Share.



Qualitative hypotheses:

\+ = positive relationship
− = negative relationship
o = conflicting hypotheses

II. Specification of the Structural Models

A structural equation predicts each of the three endogenous variables from a set of exogenous variables. The profit structural equation is identical to equation 1c of Table 2.8, except for the introduction of the endogenous advertising-sales ratio as an explanatory variable. The reader is referred to Chapter 2 for a discussion of the specification of this equation.

Advertising-Sales Structural Equation

The advertising-sales ratio is a firm's gross advertising expense divided by its sales. This equation has, in addition to the endogenous profit rate, the following exogenous explanatory variables:

Relative Firm Market Share (RFMS).—Scale economies in advertising suggest that higher levels of RFMS are an exogenous cause of lower advertising rates. More dominant firms, as measured by RFMS, enjoy real and pecuniary economies in their advertising efforts. An absolute amount of advertising in a market can be spread over more sales resulting in a real economy of scale. Media firms' volume discounts are pecuniary economies that most often are obtained by dominant firms.

However, our previous analysis found that more dominant firms are also more profitable and therefore can afford higher levels of advertising. By allocating part of their current surplus to increasing the quantity of advertising, relatively dominant firms may attempt to expand market share in order to earn even higher profits in the future. Thus, the coefficient of RMS may be either positive or negative depending upon the relative importance of advertising economies and sales expansion in the firm's marketing strategies.

Four-Firm Concentration Ratio.—The four-firm concentration ratio is hypothesized to have a negative impact on the advertising-sales ratio. Enterprise (product) heterogeneity in food retailing allows managers to differentiate their enterprises through advertising. Successful enterprise differentiation, however, depends not only on a given firm's advertising schedule but also on its competitors' advertising schedules. If one assumes all advertising has equal quality, it is not the absolute amount spent but the deviation from the amount one's competitors spend that is crucial. Firm advertising schedules are interdependent.

As markets become more concentrated, however, the incentives and possibilities for cooperation to moderate advertising increases. If oligopolists can successfully use tacit or explicit price collusion to maintain super-competitive returns as hypothesized, there is no reason to believe that similar agreements are not possible to restrict internecine advertising.[5]

Although this reasoning gives sufficient justification for the hypothesis, the same conclusion can be obtained with additional insights into market dynamics from our market restructuring hypothesis. If advertising increases a firm's market share, then the winners in the advertising race rise to dominate markets which in the process have become more concentrated. This suggests that advertising rates are relatively high in competitively structured markets because firms are attempting to restructure the market.[6] Once the market is concentrated, the survivors have less incentive to continue advertising at a high rate.[7]

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[5] This unambiguously negative hypothesis within the food retailing industry rests upon the fact that industry output is heterogeneous. Previous interindustry studies have had to contend with some industries which produce a homogeneous product. Product homogeneity implies a positive relationship between concentration and the advertising-sales ratio. For further explanation, see Comanor and Wilson, Advertising and Market Power, pp. 144–145.

[6] For an empirical study demonstrating that high levels of advertising as a percent of sales is a major factor in increasing market concentration, see Willard F. Mueller and Larry G. Hamm, "Trends in Industrial Market Concentration, 1947–1970," Review of Economics and Statistics, November 1974. Specifically, see footnote 8, p. 512 and Table 3, p. 513.

[7] There are several discussions in the trade literature consistent with this view. A recent article discussing the scrambling for market shares in Houston observes:

"Competition . . . is taking the form of a war of words with most of the chains showing major increases in advertising lineage during the first four months of this year." . . . "as a result (of the intense competition) the Better Business Bureau got a group of supermarket representatives together to draw up some advertising guidelines." "Texas Retailers Scrambling for $1.5 billion Market," Supermarket News Market Profiles, Aug. 16, 1976, pp. 28.

Although Safeway, Lucky, and Handy Andy entered the market in the early 1970s, and Houston is one of the fastest growing SMSAs in the nation, concentration is increasing. Metro Market Studies reports the following CR_4s, 1967—39.7, 1971—45.7 and 1976—46.2. Houston is in this sample.

Mean Store Size (SS).—Mean store size is introduced in the advertising structural equation for the same reason as it was introduced in the profits structural equation: namely, to adjust for understatement of four firm concentration ratios. The hypothesized sign between concentration and advertising in this regression is negative.[8]

Aggressiveness of Entry (AE).—The 1970-74 change in store numbers of an entering firm is used as a proxy for the aggressiveness of that firm's entry into an SMSA. If an entering firm expands its store numbers only modestly during the 1970–74 period, less capacity is added to the market and fewer sales must be taken from established firms. When entry is more aggressive, expanded advertising campaigns are necessary to achieve sufficient capacity utilization so that large losses are avoided. For this reason we hypothesize that more aggressive entry causes higher advertising-sales ratios for entering firms.

As shown in Figure D1, aggressiveness of entry (AE) is not specified in equation one (i.e., there is no arrow pointing from AE to P/S). This is because we hypothesize that aggressiveness of entry has a direct exogenous impact on the firm's advertising strategies, which endogenously results in a lower profit-sales ratio because of the negative trade-off between profits and advertising.

Market Size (MS).—Market size is hypothesized to have a negative relationship to the advertising-sales ratio for three reasons. First, as in Chapter 2, it is introduced to adjust for the understatement of CR_4 in large cities. Since the hypothesized concentration-advertising relationship is negative, a negative relationship between MS and advertising is also hypothesized. Secondly, the per capita cost of advertising is lower in large cities because of scale economies in the mass media. For example, the per capita cost of a one page ad in the Madison, Wisconsin market is 1 cent and in the Chicago market it is .7 cents. A given advertising program reaches the same number of people more cheaply in larger cities, other factors remaining constant.

This completes the specification of the advertising structural equation.

Change in Market Share Structural Equation

The third structural equation predicts the percentage point change in a firm's market share (CHMS). CHMS is the percentage point change in a firm's market share between 1970 and 1975. In addition to the endogenous advertising rate, there are five exogenous explanatory variables.

Relative Firm Market Share (RFMS).—Relative firm market share is hypothesized to influence CHMS both exogenously and endogenously through the advertising-sales ratio as discussed earlier. RFMS is hypothesized to have a positive exogenous impact on CHMS since a given level of CHMS (e.g., 5 percentage points) is easier for a large market share firm to achieve than for a firm with a small market share. The well-established firm with a large market share generally has preferred access to new store sites, a larger pool of trained personnel to draw from in staffing new stores, stronger consumer acceptance, and economies in advertising and store supervision. Thus, we expect RFMS to have a positive exogenous impact on CHMS in addition to the uncertain endogenous effect through advertising.[9]

Entry Barriers (E).—This variable is a measure of the barriers that an entering firm encounters. E has a value of zero for established firms. For firms that entered the market between 1967 and 1970, E is equal to the four firm concentration ratio. In this equation we hypothesize that the exogenous impact of entry barriers on CHMS is negative.

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[8] See Chapter 2.

[9] The economies of scale in advertising realized by firms with high RFMS can properly be interpreted as influencing CHMS both directly and endogenously through the advertising-sales ratio. Because of scale economies, RFMS is expected to affect the advertising rate (equation two). However, CHMS depends upon the quantity of advertising (minutes of TV, pages of newspaper ads, etc.) which is only partially measured by the advertising-sales ratio. For any given advertising-sales ratio (e.g. 1 percent) a higher RFMS implies that a firm's sales are higher than its competitors. This in turn implies that it spends more on advertising than its rivals. Thus both the advertising-sales ratio and RFMS are needed in equation three to capture the impact of different levels of advertising. RFMS is preferred to firm market share because it is not the absolute level of advertising expenditures per se that is important for expanding market share. It is the relative difference from competitors that determines whether or not a firm expands market share.

In equation one, we hypothesized that entering more concentrated markets reduces the entrant's profit-sales ratio. The entrant's hypothesized endogenous response is to retaliate by increasing its advertising rate in equation two, which in turn causes an increase in CHMS in this equation. It is unlikely that entrants expand market share more rapidly in concentrated markets. In fact, the opposite should hold if resistance to entry is highest in concentrated markets. E is introduced in this equation to allow for retaliation by established firms, so its hypothesized exogenous impact on CHMS is negative. Established firms in more concentrated markets are expected to react more aggressively to new entrants and thereby limit the entrant's gain in market share.

Entry is introduced in a complete quadratic form (E, E^2). The hypothesized signs are positive and negative respectively. Within the relevant range of CR_4, the hypothesized slope is negative, reflecting the reasoning above. The complete quadratic specification is necessary because E has a zero value for established firms. A linear format would imply that an established firm's change in market share is larger than that of entering firms. There is no economic reason to restrict CHMS in this fashion.

Firm Growth (FG).—We hypothesize that the exogenous impact of firm growth on CHMS is positive. In equation one, we hypothesized that this proxy for managerial competence was positively related to the profit-sales ratio. The hypothesized endogenous impact of higher profits would be a reduction in the advertising rate in equation two, which would lead to lower CHMS in equation three. However, FG is also hypothesized to have a positive exogenous impact on CHMS since more competent managers would be expected to more effectively utilize advertising and other resources to increase market share. This influence is in addition to any endogenous effects that FG may have through profit and advertising levels. All other things equal, we expect rapidly growing firms to achieve higher levels of CHMS.

Market Growth (MG).—Market growth is hypothesized to have a negative exogenous impact on CHMS. Since MG was specified in equation one with an expected positive sign, the hypothesized endogenous relationships suggest a negative relationship to CHMS. However, market growth is also hypothesized as an exogenous influence on CHMS. Previous studies have found a negative relation between the growth rate of industries and increases in concentration. Rapidly growing industries may experience declining or relatively stable levels of concentration whereas slowly growing industries are increasing in concentration. For example, in rapidly growing markets a grocery chain may achieve its target or maximum growth rate without dramatically expanding its market share simply because the total market is growing so fast. For this reason, market growth is hypothesized to have a negative exogenous impact on CHMS. This is in addition to but consistent with the expected endogenous influence via higher profits.

Market Size (MS).—Market size is hypothesized to be negatively related to the change in a firm's market share. In larger cities, a given change in market share entails a larger absolute sales expansion. The logistics of adding 5 percentage points to market share, for example, in Madison, Wisconsin instead of Chicago, Illinois, argues for this hypothesis. In the first instance, a firm would be expanding its sales by $6 million; in the second instance, by $150 million.

The three structural equations are listed below with the hypothesized signs. These equations correspond to the graphic models shown in Figure D.1.[10]

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[10] In order to estimate the coefficients of a simultaneous equation system certain criteria must be met. The coefficients of a given structural equation cannot be estimated when there exists a linear combination of the other equations that contains only the variables which do occur in that equation, or a subset of those variables. If this is not the case, a structural equation is identified and its coefficients can be estimated. Each of the three equations above are identified. Equation one is "just identified." Equations two and three are "over-identified." For a discussion of identification of structural equations see H. Theil, Principles of Econometrics, Chapter 9.

The stochastic specification of the model has been ommitted in the text to avoid unnecessarily confusing the readers not well versed in econometrics. Each structural error term is assumed to have constant variance and non-zero contemporaneous covariances with the remaining two error terms. All lagged covariances are assumed to be zero. This stochastic specification can be economically represented as the covariance matrix of the vector of the structural error terms, designated Σ by Thiel (p. 442). This matrix is symmetric positive semi-definite, and has no non-zero values.

(1)

$$P/S = \alpha_0 + \alpha_1 A/S + \alpha_2 RFMS + \alpha_3 CR_4 + \alpha_4 SS + \alpha_5 E + \alpha_6 FG + \alpha_7 MG + \alpha_8 MS$$

$$\alpha_1 < 0 \quad \alpha_2 > 0 \qquad \alpha_3 > 0 \quad \alpha_4 < 0 \quad \alpha_5 < 0 \quad \alpha_6 > 0 \quad \alpha_7 > 0 \quad \alpha_8 < 0$$

(2)

$$A/S = \beta_0 + \beta_1 P/S + \beta_2 RFMS + \beta_3 CR_4 + \beta_4 SS + \beta_5 AE + \beta_6 MS$$

$$\beta_1 < 0 \quad \beta_2 \neq 0 \qquad \beta_3 < 0 \quad \beta_4 > 0 \quad \beta_5 > 0 \quad \beta_6 < 0$$

(3)

$$CHMS = \gamma_0 + \gamma_1 A/S + \gamma_2 RFMS + \gamma_3 E + \gamma_4 E^2 + \gamma_5 FG + \gamma_6 MG + \gamma_7 MS$$

$$\gamma_1 > 0 \quad \gamma_2 > 0 \qquad \gamma_3 > 0 \quad \gamma_4 < 0 \quad \gamma_5 > 0 \quad \gamma_6 < 0 \quad \gamma_7 < 0$$

III. Estimation of the Structural Coefficients

Company SMSA advertising expenditure, profit and sales data furnished to the Joint Economic Committee were used to test this three equation system. The results are displayed in Table D.1. Equation set 1a–c tests the model with all exogenous variables introduced linearly except entry barriers in equation three. Equation set 2a–c introduces non-linear functional forms for other exogenous variables. Equation 3a–c is the same as 2a–c except the advertising-sales ratio is eliminated from equation one. The result is a recursive system[11] in which the SMSA profit analysis of Chapter 2 corresponds exactly with 3a, the profit structural equation.

In both systems one and two the endogenous link from advertising to profits in equations 1a and 2a is not statistically significant, however the endogenous link from profits to advertising is significant at the 1 percent level.

Exogenous factors that determine profit levels endogenously affect the rate of advertising but not vice versa. This is more consistent with the notion that both elements are simultaneously determined by the underlying competitive environment than by a profit-advertising trade-off interpretation.

Since the endogenous relationship from advertising to profits in model two is not significant, the recursive model captures the joint nature of the decision-making process very well. It is easier to analyze endogenous relationships in the recursive model, so the following analysis refers to the third set of equations in Table D.1.

The exogenous determinants of the profit rate in equation 3a are identical to those in equation 1c of Table 2.8 in Chapter 2. The results for this subsample of the 27 observations of three of the six firms in that sample conform quite closely with the results of the total sample. The only notable exception is that concentration is not statistically significant in the smaller sample. It does, however, have the hypothesized positive sign.

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[11] An n equation simultaneous system is recursive when its structural equations can be ordered such that the matrix of the endogenous coefficients is upper triangular. This means all of the arrows between endogenous variables in a flow chart such as Fig. D.1 "point" away from one endogenous variable. A recursive system has no two-way flows between endogenous variables.

APPENDIX TABLE D.1.—SIMULTANEOUS EQUATIONS SYSTEMS PREDICTING THE LEVEL OF THE PROFIT SALES, ADVERTISING SALES RATIO, AND CHANGE IN FIRM MARKET SHARE BETWEEN 1970 AND 1975 FOR 3 COMPANIES IN 27 SMSAs [1]

Dependent variables	Intercept	Endogenous variables: Average 1970–74 profit-sales ratio (P/S)	Endogenous variables: Average 1970–74 advertising sales ratio (A/S)	Exogenous variables: Relative firm market share (RFMS)	4-firm concentration ratio (CR_4)	Curvilinear 4-firm concentration ratio (CCR_4) [2]	Mean store size (SS)	Entry barriers (E)	Entry barriers squared (E^2)	Aggressiveness of entry (AE)	Firm growth (FG)	Logarithm of firm growth (LNFG)	Market growth (MG)	Market growth squared (MG^2)	Market size (MS)	Market size squared (MS^2)
1a—P/S	−0.042		−0.210	0.039	0.013		−1.495	−0.039			2.881		0.032		0.035	
			(.478)	[3] (3.368)	(.921)		[3] (2.235)	[3] (4.709)			[3] (2.973)		[3] (1.897)		(.198)	
1b—A/S	1.940	−.213		.007	−.008		−.298			0.060					.086	
		[3] (3.275)		(1.453)	+(1.331)		(.967)			[3] (4.807)					(1.125)	
1c—CHMS	−6.739		3.620	.161				.158	−0.002		−.005		.028		.82	
			[5] (2.039)	[3] (3.265)				[3] (1.847)	[5] (1.794)		(.130)		(.398)		(1.201)	
2a—P/S	−6.104		−.120	.062		.981	−1.117	−.033				1.878		0.084	−1.854	0.520
			(.188)	[3] (4.915)		(.299)	[5] (1.927)	[3] (4.121)				[3] (3.632)		[5] (2.044)	[3] (3.029)	[3] (2.744)
2b—A/S	3.733	−.201		.010		−2.362	−.276			.046					−.263	
		[3] (3.572)		[4] (1.957)		[3] (2.569)	(1.056)			[3] (3.632)					[5] (2.426)	
2c—CHMS	−7.043		3.511	.168				.158	−.002			−.033	.022		.852	
			[5] (2.023)	[3] (3.466)				[5] (1.886)	[5] (1.748)			(.008)	(.320)		(1.250)	
3a—P/S	−5.327			.062		.460	−1.162	−.032				1.839		.084	−1.829	.500
				[3] (5.132)		(.243)	[5] (2.024)	[3] (4.808)				[3] (5.291)		[5] (2.163)	[3] (3.153)	[3] (3.335)
3b—A/S	+3.758	−.201		.010		−2.384	−.279			.045					−.264	
		[3] (3.594)		[4] (1.972)		[3] (2.621)	(1.071)			[3] (3.795)					[5] (2.464)	
3c—CHMS	−7.105		3.525	.169				.158	−.002			−.033	.023		.858	
			[5] (2.036)	[3] (3.478)				[5] (1.892)	[5] (1.755)			(.001)	(.333)		(1.259)	

[1] 3 stage least squares (3SLS) estimates are reported. The 2 stage least squares (2SLS) estimates are less efficient (lower t ratios) as would be expected, however the parameter estimates are generally similar to those presented. The one exception is the quadretic entry barriers specification in equation 3. The absolute values of the 3SLS coefficients are twice as large as the 2SLS estimates.

[2] For mathematical definition see footnote 2 on table 2.6.

[3] Significance level equals 1 percent.

[4] Significance level equals 10 percent.

[5] Significance level equals 5 percent.

Note: A 1-tail test is applied to all coefficients except the coefficient for RFMS in equations 16, 26' and 36. In these cases a 2-tail test is applied.

In equation 3b, the profit-sales ratio has the hypothesized negative relationship to advertising and is statistically significant at the 1 percent level. A 1 percentage point decrease in profits endogenously increases the advertising-sales ratio by .2 percentage points, indicating a negative trade-off between current profits and the level of advertising. In equation 3c, advertising has the hypothesized positive impact on CHMS and is significant at the 5 percent level. A 1 percentage point increase in the advertising-sales ratio leads to a change in market share of 3.5 percentage points. This supports the theoretical work of Chamberlain and Bain that concluded advertising should play an important intermediary role in a food retailer's long run profit maximization strategy.

The exogenous impact of RFMS on the advertising rate in 3d is unambiguously positive. Since the direction of the relationship was not hypothesized because of competing hypotheses, a two tailed t-test is applied. The coefficient is significant at the 10 percent level. The exogenous impact of advertising scale economies is apparently more than compensated for by the competitive strategies of leading firms.[12]

Four-firm concentration has the hypothesized negative influence on advertising and is statistically significant at the 1 percent level. Thus, firms in less concentrated markets have higher advertising-sales ratios. This higher rate of advertising leads to a larger change in the firm's market share. This suggests that the national chains studied are expanding market share more rapidly in unconcentrated markets. In most markets these national chains are among the largest four companies. Thus, unless their expansion is at the expense of other firms in the top four, four firm concentration also increases.

The coefficient for mean store size (SS), a control variable, is not significantly different from zero. Aggressiveness of entry (AE) and market size (MS) have the hypothesized signs and are statistically significant at the 1 and 5 percent levels respectively. If an entering chain added 10 stores to the market, holding other exogenous variables such as market size and growth constant, its advertising rate increased by .45 percentage points. Firms that aggressively enter a new market opt for higher advertising during the entry period.

In equation 3c, RFMS is positively related to CHMS and statistically significant at the 1 percent level. This is consistent with our reasoning that the better access to store sites and personnel and economies of advertising enjoyed by leading firms allow them to realize higher CHMS. Leading firms are not only advantaged in the pursuit of current profits but also in expansion of their share of the market.

The coefficients for entry barriers and entry barriers squared are significant at the 5 percent level with the appropriate sign. The quadratic attains a maximum value at a four firm concentration ratio of 36 percent and steadily declines as the concentration of the entered market increases. Since all entry occurred in markets whose concentration ratios were greater than 35, entry barriers were a depressant on the entrant's gain in market share as hypothesized.

The remaining variables in equation 3c add little explanatory power to the model. The coefficient for firm growth is not significantly different from zero. Market growth and market size do not have the hypothesized signs, nor are their coefficients statistically significant.

IV. Relationships Between Market Structure and the Endogenous Variables

In this section we investigate the economic implications of the recursive model (equations 3a-c). Table 2.9 of Chapter 2 displays the estimated profit-sales ratios

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[12] The simultaneous framework isolates the exogenous impact of RFMS on P/S and A/S. Scale economies in advertising by their nature are an exogenous influence on the advertising-sales ratio. Previous single equation negative correlations between RFMS and A/S have been cited as evidence of scale economies in advertising. Such equations are reduced form equations of underlying structural models, hence they measure the total effect of RFMS on A/S, not the exogenous (partial) effect of RFMS on A/S. In model three the total effect is: $A/S = (\beta_2 + \beta_1 a_2)\ RFMS = (.10 - (.201 * .062))RFMS = -.002\ RFMS$. This is consistent with previous single equation results but the negative total relationship is not only due to scale economies that limit the magnitude of the positive partial effect but also to the importance of RFMS in obtaining a high profit-sales ratio and the negative trade-off between the profit and advertising-sales ratios.

for various levels of market concentration and relative firm market share, two important measures of market structure. Tables D.2 and D.3 are comparable tables which indicate the advertising-sales ratios and changes in market share estimated by equations 3b and 3c for various combinations of market concentration and relative firm market share.

Table D.2 indicates the advertising-sales ratio decline very modestly as RFMS increases, but very dramatically as market concentration increases. The level of advertising for an established firm in a "competitive" market structure (RFMS=25, CR_4=40) is 1.22 percent. Moving from a market with competitive structure to a market with a CR_4 of 70 and RFMS of 55 lowers the advertising rate by .63 percentage points to .59 percent. By comparison, Table 2.9 of Chapter 2 shows this move increases the profit-sales ratio by 2.47 percentage points to 3.62 percent.[13]

APPENDIX TABLE D.2.—LEVELS OF THE ADVERTISING SALES RATIO PREDICTED BY LEVELS OF RELATIVE FIRM MARKET SHARE AND 4-FIRM CONCENTRATION RATIO FOR AN ESTABLISHED FIRM*

Relative firm market share RFMS	4-firm concentration (CR_4)			
	40	50	60	70
10	1.26	0.88	0.73	0.70
25	1.22	.84	.69	.66
40	1.19	.81	.66	.63
55	1.15	.77	.62	.59

*This relationship's equation is A/S=3.196−0.0025 RFMS−2.476 CCR_4. All other exogenous variables except those signalling entry, are entered at their mean values. This equation is a reduced form relationship derived from the structural equations 3a–c of table D.1.

These findings are consistent with our hypotheses. Firms in less competitively structured markets have lower advertising-sales ratios due to advertising scale economies, a reduced desire to restructure the market and/or other factors. The decrease in the advertising-sales ratio is much smaller than the increase in the profit rate. Thus, profits in less competitive markets are not solely attributable to lower advertising expenses.

Table D.3 shows the estimated absolute percentage point change between 1970 and 1975 in an established firm's market share for various levels of RFMS and CR_4. This table suggests relatively stable conditions for concentrated markets in which the largest four firms have approximately equal market shares (RFMS=25). However, firms with smaller market shares are estimated to lose market shares in most markets. Conversely, firms with RFMS greater than 25 are estimated to increase their market shares further. Carried to its ultimate conclusion, this table sugests duopoly or monopoly market structures for metropolitan areas.

Given the limited sample size on which these results are based and the lack of compelling economic rationale or evidence to support the market dynamics suggested by Table D.3, the results must be interpreted cautiously.[14] The results may be heavily influenced by the evolution of two of the nation's most concentrated markets. In one of these, the two market leaders have dramatically expanded market shares in recent years. In the other, the two market leaders registered modest gains during the 1970–74 period while the third and fourth firms stagnated or lost market share.

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[13] The dependent variable for Table 2.9 is an average of the 1970, 71 and 74 profit rates, whereas this appendix uses the 5 year average profit rate. A more appropriate comparison would be the change in the five year average profit rate in equation 1c, Table 2.8 which is 2.72 percentage points.

[14] The results indicate a negative effect of firm growth on CHMS; this is also contrary to economic logic. It suggests that more skillfully managed firms achieve lower CHMS than less skillfully managed firms. In the long run this implies that firms who initially have the least skillful management, ultimately rise to dominate the market.

APPENDIX TABLE D.3.—CHANGE IN FIRM MARKET SHARE BETWEEN 1970 AND 1975 PREDICTED BY LEVELS OF RELATIVE FIRM MARKET SHARE AND 4-FIRM CONCENTRATION RATIO FOR AN ESTABLISHED FIRM*

[Percentage point change in market share]

Relative firm market share RFMS	4-firm concentration (CR_4)			
	40	50	60	70
10	†−0.62	−1.99	−2.49	−2.62
25	1.78	.41	−.09	−.22
40	4.18	2.81	2.31	2.18
55	6.58	5.21	4.71	4.58

*This relationships equation is CHMS=4.500−8.738 CCR_4+0.160 RFMS. All other exogenous variables, except those signalling entry, are entered at their mean values. This equation is a reduced form relationship derived from the structural equations 3a–c of table D.1.

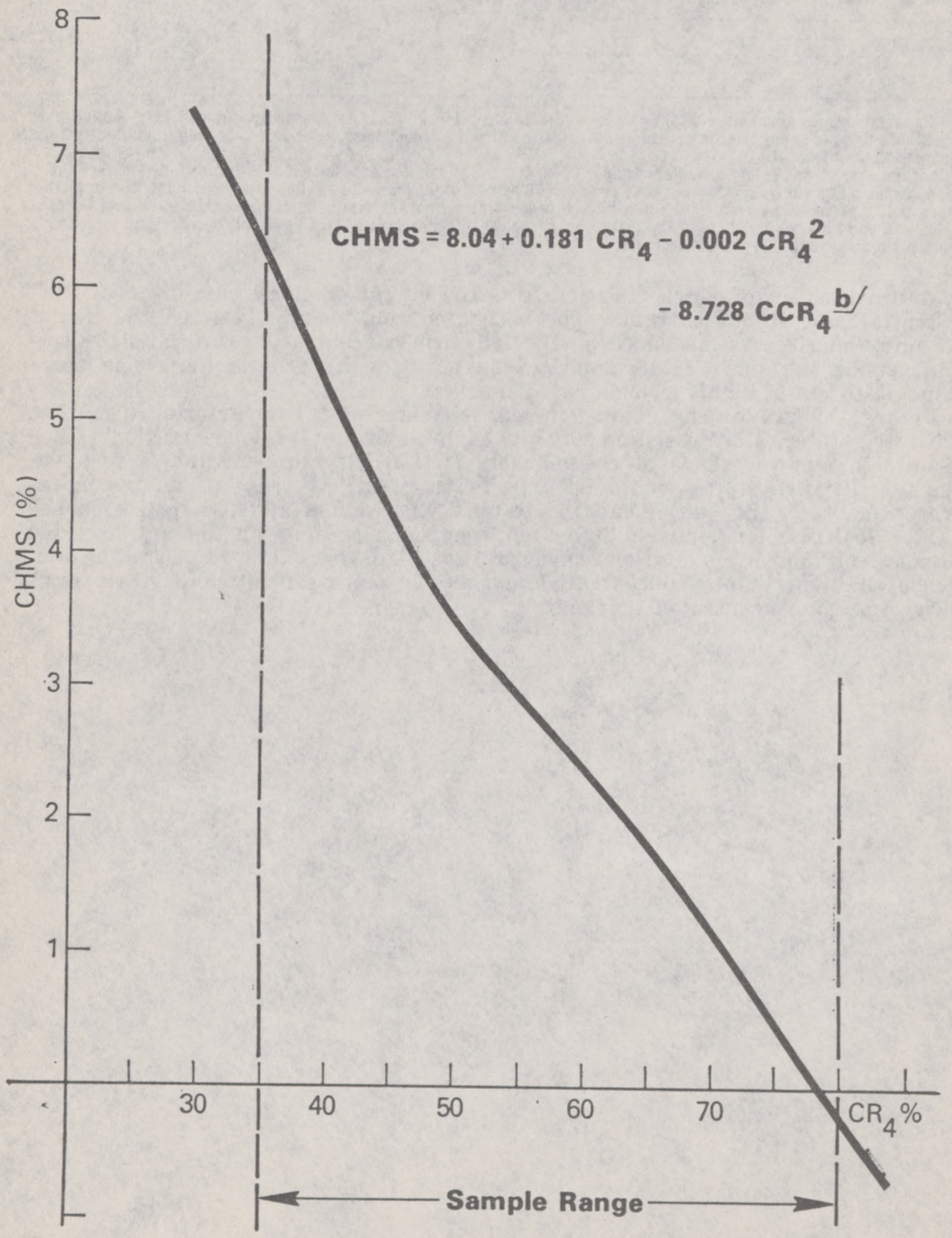
†Another way of presenting this relationship is to express the gain or loss as a percent of the firm's initial market share. For example, a firm with a RFMS=25 and CR_4=40 has 10 percent of the market, so in this case an absolute gain in market share of 1.78 percentage points results in a 17.8-percent increase from the firm's initial market share. When a firm has RFMS=55 and CR_4=40, its share of the market is 22 percent. In this case the 6.58-percentage point gain recorded in table D.3 represents a 25.4 percent increase.

A third aspect of market structure is the height of entry barriers that face potential and actual entrants. The estimated relationship between the height of entry barriers as measured by the four-firm concentration ratio and the two endogenous variable CHMS and P/S support the hypothesis that it is more difficult to enter highly concentrated markets.

Figure D.2 graphs the change in market share of a firm entering a market with five stores. More resistance at higher levels of market concentration (CR_4) results in a lower share of the markets (CHMS) for an entrant. A firm entering with five stores would be expected to gain 5 percent of an unconcentrated market (CR_4=40) compared to only 1 percent of a concentrated market (CR_4=70). Earlier analysis indicated the profit rate of an entrant becomes progessively lower as market concentration increases. This supports the evidence that entry into concentrated markets is more difficult and costly than entry into unconcentrated markets.

Appendix Figure D.2.

The Change in Market Share Between 1970 and 1975 of a Firm Entering a Market with Five Stores Predicted by the Four Firm Concentration Ratio (a Measure of the Height of Barriers to Entry).[a/]



a/ Except for RFMS, which is given zero value, all other variables are held constant at their mean values. The equation predicting CHMS is a reduced form equation derived from the structural equations 3a-c of Table D.1. On the average, entering firms added 4.3 stores during the 1970-74 period.

b/ CCR_4 is a positive monotonic function of CR_4. See footnote a/ of Table 2.6 of Chapter 2 for its formula.

V. Conclusion

In this appendix the single equation industrial organization model of Chapter 2 is generalized to allow market performance to feed back to market structure. The test results generally support the hypothesis that market structure is not only an important determinant of the current profit-sales ratio but also the current advertising-sales ratio and the change in a firm's market share.

When interpreting these results, two substantial caveats must, however, be emphasized. First, the test conclusions are based only on twenty-seven observations of three national firms. The results are at most generalizable to leading regional or national chains. Secondly, predictions of dynamic behavior based upon these results should be recognized as crude sketches of the future time path of a market based upon observed slopes in several markets from one time period, 1970 to 1974. Clearly, the future holds many unforeseen contingencies for which this model does not account.

The most important contribution of this appendix is probably methodological. At the very least, this attempt to answer Butter's criticism of previous single equation research points clearly to the type of data economists need and the sort of models required to provide a definitive framework explaining firm behavior in the food retailing industry.

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APPENDIX TABLE D.4.—ALTERNATIVE SPECIFICATIONS FOR THE SIMULTANEOUS PREDICTION OF THE LEVEL OF THE PROFIT-SALES, ADVERTISING-SALES RATIO AND CHANGE IN FIRM MARKET SHARE BETWEEN 1970 AND 1975 FOR 3 COMPANIES IN 27 SMSAs[1]

		ENDOGENOUS variables			EXOGENOUS variables[2]											
Independent variables	Intercept	Average 1970–74 profit sales ratio (P/S)	Average 1970 advertising sales ratio (A/S)	1970–75 change in firm market share (CHMS)	Relative firm market share (RFMS)	Curvilinear four firm concentration (CCR)[3]	Mean store size (SS)	Binary entry (BE)[4]	Entry barriers (E)	Entry barriers squared (E^2)	Aggressiveness of entry (AE)	Logarithm of firm growth (LNFG)	Market growth (MG)	Market growth squared (MG^2)	Market size (MS)	Market size squared (MS^2)
1a. P/S	—6.470				0.093	0.010	—1.834					2.068		0.037	—2,917	0.845
					**(6,740)	(.400)	(2.443)					**(4,361)		(.706)	**(3.882)	**(4.445)
1b. A/S	5.176	—.265			.015	—3.483	0.571								—.375	
		**(3.569)			*(2.153)	**(3.394)	*(1.766)								**(2.995)	
1c. CHMS	—21.640		6.986		.194							2.741	0.029		.980	
			**(4.762)		**(4.182)							*(1.429)	(.417)		*(1.403)	
2a. P/S	—3.613				.062	—.788	—1.393	—1.619				1.793		.049	—1.859	.462
					**(4.648)	(.383)	*(2.354)	**(4.036)				**(4.744)		(1.243)	*(2.960)	**(2.772)
2b. A/S	5.120	—.210			.014	—3.659	—.531	.247							—.301	
		*(2.075)			*(2.494)	**(3.544)	*(1.778)	(.820)							**(2.765)	
2c. CHMS	—16.25		5.968		.178			.184				1.749	.018		.846	
			**(2.454)		**(3.396)			(.077)				(.234)	(.234)		(1.135)	
3a. P/S	—5.326				.062	.452	—1.158		—3.215			1.840		.084	—1.530	.500
					**(5.135)	(.238)	*(2.013)		**(4.306)			**(5.294)		*(2.154)	**(3.154)	**(3.354)
3b. A/S	3.731	—2.02			.010	—2.416	—.271				0.044				—.268	
		**(3.609)			*(1.996)	**(2.658)	(1.037)				**(3.758)				**(2.496)	
3c. CHMS	—6.432		3.052		.169			8.130	—.112			—.376	.019		.842	
			*(1.678)		**(3.457)			*(1.865)	*(1.424)			(.193)	(.277)		(1.245)	
4a. P/S	—8.756			0.148	.037	.347	—.625		—4.256			2.005		.085	2.148	.630
				(.398)	(.584)	(.475)	(.338)		*(1.459)			**(3.925)		*(1.907)	*(1.925)	*(1.699)
4b. A/S	3.319	—.195			.009	—1.990	—.225				.065				—.227	
		**(3.512)			*(1.805)	**(2.092)	(.885)				**(4.673)				*(2.053)	
4c. CHAS	—8.576		4.46		.162				.091	—0.001		.398	—.481		.685	
			*(1.646)		**(3.061)				(.760)	(.806)		(.161)	(.059)		(.891)	

[1] 3 stage least squares estimates are reported.
[2] For the units in which the variables are expressed see footnote (1) in table 2.6.
[3] For the formula of this nonlinear function see footnote (2) in table 2.6.
[4] Binary entry (55) indicates whether or not the observation is from an established or entering firm. A value of 1 indicates entry.

Note: Significance levels: **=1 percent; *=5 percent; +=10 percent. A 1-tail test is applied to all coefficients except the coefficients for RFMS in equations Ib., 2b., and 3b. In these cases a 2-tail test is applied.

APPENDIX TABLE D.5.—CORRELATION MATRIX FOR THE REGRESSION EQUATIONS DISPLAYED IN APPENDIX TABLES D.1 AND D.4

	P/S	A/S	CHMS	RFMS	CR_4	CCR_4	SS	BE	E	E^2	AE	FG	LNFG	MG	MG^2	MS	MS^2
P/S	1																
A/S	−.456	1															
CHMS	.007	.307	1														
RFMS	.610	−.225	.462	1													
CR^4	.189	−.275	−.134	.309	1												
CCR^4	.275	−.381	−.127	.383	.801	1											
SS	−.273	−.273	−.360	−.135	−.135	.132	1										
BE	−.749	−.749	.075	−.543	−.544	−.080	.143	1									
E	−.735	−.735	.007	−.531	−.531	.025	.256	.953	1								
E^2	−.645	−.645	−.040	−.462	−.462	.116	.332	.811	.948	1							
AE	−.166	.714	.425	−.109	.152	−.339	−.295	.349	.261	.196	1						
FG	.012	−.300	−.410	−.487	.013	.110	.178	.231	.295	.322	−.038	1					
LNFG	.034	−.299	−.387	−.459	.018	.113	.175	.222	.285	.314	−.026	.999	1				
MG	.167	.064	.031	.011	.277	.289	.057	.216	.254	.283	.297	.330	−.299	1			
MG^2	.161	.062	−.015	−.036	.319	−.285	.064	.166	.255	.270	.307	.301	.318	.966	1		
MS	−.117	−.040	.030	−.133	−.477	−.765	.086	−.163	−.170	−.157	−.171	−.090	.038	−.424	−.384	1	
MS^2	−.100	−.059	−.067	−.220	−.477	−.789	.071	−.191	−.190	−.168	−.063	−.090	.093	−.454	−.393	.971	1

Appendix E. DETERMINANTS OF THE CHANGE IN SMSA FOUR-FIRM CONCENTRATION BETWEEN 1967 AND 1975

Chapters 3 and 4 provide evidence that market concentration is systematically related to the prices and profits of large food retailers. This appendix reports the results of a multiple regression analysis measuring the impact of various factors on changes in four-firm concentration in 86 SMSAs between 1967 and 1975.[1] The results of this analysis are discussed briefly in the local market concentration section of Chapter 1. This appendix defines the variables appearing in the regression model gives their hypothesized relationship to change in market concentration, and reports the results in Appendix Table E.1.

Dependent Variable

Change in Four-Firm Concentration 1967–1975, PCHCR$_4$.—The change in four-firm concentration is defined as the absolute percentage point change in market concentration in an SMSA between 1967 and 1975.

Percent Change in Four-Firm Concentration 1967–1975, PCHCR$_4$.—This variable is the change in concentration (CHCR$_4$) calculated as a percent of 1967 CR$_4$.

Independent Variables

Horizontal Mergers (HM).—Horizontal mergers measure the share of the market acquired by merger between 1967 and 1975 by the top four firms in each SMSA or a merger below the top four which increases CR$_4$. HM is hypothesized to have a positive relationship with CHCR.

Horizontal Mergers (PHM).—This variable is the same as HM except that it is expressed as a percentage of CR$_4$ in 1967. We hypothesize that it will be positively related PCHCR$_4$.

Number of Large Food Chains in SMSA in 1967 (NFC).—This variable measures the number of large food chains that were operating in an SMSA in 1967. Large food chains are defined as multi-market food retailers with sales exceeding $500 million in 1972.[2] These firms enjoy conglomerate-derived market power because of their multi-market character.[3] This power permits them to engage in competitive strategies to expand their market shares that are not available to small food retailers. Therefore, NFC is hypothesized to be positively related to the change in CR$_4$ between 1967 and 1975.

Large Food Chain Exit (FEX).—FEX indicates the number of large food chains that have exited from an SMSA between 1967 and 1974. FEX is hypothesized to be negatively related to CHCR$_4$.

Large Food Chain Entry De Novo (FEDN).—FEDN indicates the number of large food chains that have entered an SMSA during 1967–1974 by internal expansion of their retailing operations to a new geographical area.[4] Because large

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[1] The sample included only those SMSA for which it was possible to make reliable comparisons between 1967 and 1975. The 1967 CR$_4$s are from Census tabulations (Appendix Table F.1) and the 1975 CR$_4$s are based upon Grocery Distribution Guide for 1976, Metro Market Studies, Inc. Because Metro estimates differ from those of Census, the CR$_4$s used for 1975 were estimated as follows: Metro CR$_4$ (1975) X Census CR$_4$ (1972)/Metro CR$_4$ (1972).

[2] There were 22 chains of this size excluding A&P. Because A&P is introduced as an independent variable in the model, it is excluded from this and other "large food chain" variables. See the discussion of the A&P variable for the reason for the special treatment accorded A&P.

[3] For a discussion of the competitive strategies available to large multimarket food chains see Willard F. Mueller, "The Conglomerate Food Retailer," Subcommittee on Antitrust and Monopoly, Committee on the Judiciary, U.S. Senate, Sept. 12, 1966; and Federal Trade Commission Staff Report on the Structure and Competitive Behavior of Food Retailing, Chapters 5 and 6, January 1966.

[4] Allied Supermarkets entry into a new market by servicing the food unit of a K-Mart general merchandise store is not treated as de novo entry by a large food chain. This is because Allied's opportunities for expanding its store numbers are directly tied to K-Mart's decision to build more stores. Since a market of a given size can support relatively few K-Mart stores, Allied's impact on CR$_4$ in an SMSA is limited.

food chains possess conglomerate power, they have the capacity to expand at the expense of less powerful firms. Moreover, their entry, whether de novo or by acquisition (as in FEM below), is likely to trigger a defensive response by leading firms already in the market. In the ensuing rivalry for market position, smaller, less powerful firms are likely to lose market share to the market leaders.[5] For these reasons FEDN is hypothesized to be positively related to $CHCR_4$.

Large Food Chain and Large Non-Food Corporation Entry by Merger (CEM).—This variable indicates the number of large food chains that entered as SMSA during 1967–1974 by acquisition of an established firm.[6] It also measures the number of large corporations not previously in food retailing that entered an SMSA between 1967 and 1974 by acquiring an established supermarket chain.[7] All acquiring firms had assets of over $100 million. Therefore it is hypothesized that both large grocery chains and large non-food firm entrants have conglomerate derived power as discussed under NFC above. CEM is therefore also hypothesized to have a positive relationship with CHCR.

Market Share of A&P in 1967 (SAP).—As discussed earlier, A&P has had a poor profit performance record for over a decade, and has steadily lost market share. Although it possesses potential conglomerate-derived power because it is a large multi-market retailer, its low profits greatly diminished such power during the period examined. Because of its poor performance, we hypothesize that the larger A & P's presence in an SMSA in 1967 and hence the greater the likelihood that it was one of the top four firms, the greater the likelihood that CR_4 decreased between 1967–75.

Four-Firm Concentration Ratio in 1967 (CR_4).—Economic theory suggests and several empirical studies have found that, other things remaining the same, CR_4 tends to be eroded in highly concentrated markets.[8] CR_4 is therefore hypothesized to have a negative relationship with $CHCR_4$.

Market Growth (MG).—Market growth is defined as the percentage increase in deflated grocery store sales in each SMSA between 1967 and 1972 as reported by the U.S. Census. MG is hypothesized to have a negative relationship with $CHCR_4$.[9]

Market Size (MS).—Market size is defined as the 1972 sales of grocery stores with payroll for each SMSA as reported by the U.S. Census. MS is hypothesized to have a negative relationship with $CHCR_4$.[10]

Equations 1 and 2 give the basic models using the above dependent and independent variables; Table E.1 displays the results of testing the models.

$$(1)\quad CHCR_4=\beta_0+\beta_1 HM+\beta_2 NFC+\beta_3 FEX+\beta_4 FEDN$$

$$\text{Hypotheses: } \beta_1>0 \quad \beta_2>0 \quad \beta_3<0 \quad \beta_4>0$$

$$+\beta_5 CEM+\beta_6 SAP+\beta_7 CR_4+\beta_8 MG+\beta_9 MS$$

$$\beta_5>0 \quad \beta_6<0 \quad \beta_7<0 \quad \beta_8<0 \quad \beta_9<0$$

$$(2)\quad PCHCR_4=\alpha_0+\underset{\alpha_1>0}{\alpha_1 PHM}+\underset{\alpha_2>0}{\alpha_2 NFC}+\underset{\alpha_3<0}{\alpha_3 FEX}+\underset{\alpha_4>0}{\alpha_4 FEDN}$$

$$\text{Hypotheses: }$$

$$+\underset{\alpha_5>0}{\alpha_5 CEM}+\underset{\alpha_6<0}{\alpha_6 SAP}+\underset{\alpha_7<0}{\alpha_7 CR_4}+\underset{\alpha_8<0}{\alpha_8 MG}$$

$$+\underset{\alpha_9<0}{\alpha_9 MS}$$

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[5] For a case study of this process see FTC Report on Food Retailing, op. cit., pp. 111–115.

[6] All but one of these acquisitions occurred during 1968 and 1969.

[7] All of these acquisitions occurred during 1967–1972.

[8] George J. Stigler "The Theory of Oligopoly," The Theory of Price, 1952; also Willard F. Mueller and Larry G. Hamm, "Trends in Industrial Concentration, 1947 to 1970."

[9] For a discussion of the rationale underlying this hypothesis, see Mueller and Hamm, Review of Economics and Statistics, November 1974, pp. 514.

op. cit., p. 514.

[10] Ibid.

APPENDIX TABLE E.1.—MULTIPLE REGRESSION EQUATIONS PREDICTING THE CHANGE IN 4-FIRM CONCENTRATION FROM 1967 TO 1975 IN 86 SMSA'S[1]

Dependent variable (1967–75)	Intercept	Independent variables: Horizontal mergers (HM)	Percent horizontal mergers (PHM)	Number of large food chains (NFC)	Large food chain entry de novo (FEDN)	Large food chain exit (FEX)	Conglomerate merger (CEM)	Market share of A. & P. in 1967 (SAP)	4-firm concentration ratio, 1967 (CR4)	Market growth, 1967–72 (MG)	Market size (MS)	R^2	F ratio
Absolute change:													
Ia. $CHCR_4$	0.9806	1.450		2.373	0.924		3.594		−0.103	−0.022	−2.284	0.534	[2] 11.17
		[2] (2.367)		[2] (3.008)	[3] (2.606)		[2] (3.325)		(−1.561)	(−0.408)	[4] (−1.631)		
Ib. $CHCR_4$	3.7983	1.347		2.236	0.752		3.276	−0.249	−0.093	−0.043	−2.074	0.592	[2] 12.43
		[2] (2.383)		[2] (2.964)	[3] (2.117)		[3] (3.306)	[3] (−1.841)	(−1.051)	(−0.799)	[3] (−1.709)		
Ic. $CHOR_4$	2.0992	1.376		1.986	0.750	1.431	3.098	−0.235	−0.060	−0.037	−2.011	0.579	[2] 10.45
		[3] (2.338)		[2] (2.488)	[3] (2.086)	(1.015)	[2] (2.952)	[3] (−1.734)	(−0.662)	(−0.671)	[4] (−1.554)		
Relative change:													
2a. $PCHCR_4$	10.0270		1.499	4.996	2.503		7.351		−0.382	−0.054	−4.311	0.590	[2] 14.01
			[2] (2.766)	[2] (2.924)	[2] (3.249)		[2] (3.194)		[3] (−1.940)	(−0.496)	[4] (−1.481)		
2b. $PCHCR_4$	16.1667		1.391	4.589	2.176		6.688	−0.484	−0.369	−0.091	−3.863	0.645	[2] 15.53
			[2] (2.803)	[2] (2.817)	[2] (2.838)		[3] (3.196)	(−1.620)	[3] (−1.888)	(−0.782)	[4] (−1.526)		
2c. $PCHCR_4$	14.2951		1.411	4.347	2.173	1.579	6.498	−0.469	−0.335	−0.084	−3.835	0.637	[2] 13.34
			[2] (2.776)	[2] (2.525)	[2] (2.796)	(0.506)	[2] (2.971)	[3] (−1.545)	[3] (−1.664)	(−0.701)	[4] (−1.465)		

[1] The reported regressions are weighted to correct heteroskedasticity. The error term's variance is larger in small cities. The variance, σ^2, is estimated from the regression residuals by assuming the following functional form, $\sigma^2 = \propto (MS)B$. Representative estimated values for $\propto$ and B are 3 and −.2 respectively.

[2] Significance of levels equals 1 percent.

[3] Significance of levels equals 5 percent.

[4] Significance of levels equals 10 percent.

Note: 2-tail tests for significance were used on FEDN and FEX; 1-tail tests were used for all other independent variables.

APPENDIX TABLE E.2.—CORRELATION MATRIX FOR THE REGRESSION EQUATIONS DISPLAYED IN APPENDIX TABLE E.1

	HM	FEDN	FEX	NFC	CEM	CR_4	MG	MS	$CHCR_4$	SAP	$PCHCR_4$	PHM
HM	1.000											
FEDN	−.163	1.000										
FEX	.119	.120	1.000									
NFC	.140	.092	.282	1.000								
CEM	.012	.223	.239	.251	1.000							
CR_4	−.182	−.292	−.288	.099	−.030	1.000						
MG	−.195	.165	−.161	.020	−.007	.258	1.000					
MS	.188	−.036	.046	.245	.267	.113	−.164	1.000				
$CHCR_4$	.213	.337	.363	.356	.391	−.205	−.056	.050	1.000			
SAP	−.021	−.410	−.181	−.136	−.192	.222	−.234	.091	−.370	1.000		
$PCHCR_4$	.234	.391	.354	.335	.367	−.292	−.082	.057	.981	−.384	1.000	
PHM	.991	−.141	.119	.133	.008	−.218	−.181	.182	.228	−.043	.251	1.000

Appendix F. GROCERY STORE AND SUPERMARKET CONCENTRATION RATIOS BY SMSA

APPENDIX TABLE F.1.—CONCENTRATION OF GROCERY STORE AND SUPERMARKET SALES BY 4, 8, AND 20 LARGEST FIRMS, 263 SMSAs, 1954, 1958, 1963, 1967, AND 1972

Standard metropolitan statistical area	Percentage of grocery store sales accounted for by—															Percentage of 1972 supermarket sales by top—	
	Top 4 grocery store companies					Top 8 grocery store companies					Top 20 grocery store companies						
	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	4 firms	8 firms
Abilene, TX	44.0	54.3	54.4	52.2	48.1	52.9	65.5	68.4	66.2	69.8	68.0	79.3	83.7	84.8	83.5	(1)	100.0
Akron, OH	48.5	61.0	62.1	52.6	53.4	55.3	70.8	71.2	72.7	70.9	63.2	76.6	78.3	80.6	80.7	67.9	(1)
Albany, Ga	45.5	49.3	51.7	50.3	44.9	60.3	63.1	66.1	67.5	67.0	75.4	80.7	80.3	82.5	85.1	67.9	96.1
Albany-Schenectady-Troy, NY	39.3	47.5	47.8	44.4	53.2	50.8	54.9	57.7	58.5	64.8	57.7	62.9	66.3	68.5	73.6	67.5	(1)
Albuquerque, N. M	49.8	60.3	68.7	69.5	66.3	62.3	71.9	74.0	79.5	84.2	74.4	81.8	82.7	88.5	90.0	84.4	99.1
Alexandria, LA	n.a.	n.a.	n.a.	n.a.	44.0	n.a.	n.a.	n.a.	n.a.	52.2	n.a.	n.a.	n.a.	n.a.	62.5	92.2	100.0
Allentown-Bethlehem-Easton, PA-NJ.[6]	49.1	54.7	52.3	51.1	40.3	53.5	60.9	58.4	62.6	51.5	58.3	68.3	67.6	73.1	70.8	[2]53.0	[2]69.0
Altoona, PA	65.9	67.8	64.2	61.3	56.4	68.8	71.2	76.8	76.5	74.8	74.4	77.7	83.1	85.0	86.9	75.7	100.0
Amarillo, TX	62.5	68.9	62.8	60.9	62.7	72.3	75.7	70.9	74.7	82.1	83.1	86.9	86.4	89.3	94.8	[2]74.9	[2]96.0
Anaheim-Santa Ana-Garden Grove, CA	39.6	47.1	43.2	38.6	44.1	54.1	63.0	61.8	58.8	67.3	66.8	77.2	79.6	83.2	88.7	[3]49.0	[3]75.0
Anchorage, AK	n.a.	n.a.	n.a.	n.a.	70.3	n.a.	n.a.	n.a.	n.a.	84.4	n.a.	n.a.	n.a.	n.a.	95.3	80.8	[2]96.0
Anderson, IN	38.6	38.4	42.1	49.8	61.8	58.2	63.8	63.6	67.5	77.7	77.6	85.8	87.4	91.3	95.1	[3]75.0	[2]94.0
Ann Arbor, MI	55.5	59.7	61.0	66.0	65.2	62.6	67.7	70.9	77.9	80.7	72.8	79.5	81.9	87.4	92.3	[3]74.0	91.1
Appleton-Oshkosh, WI	n.a.	n.a.	n.a.	n.a.	26.6	n.a.	n.a.	n.a.	n.a.	41.4	n.a.	n.a.	n.a.	n.a.	69.2	34.6	53.9
Asheville, NC	n.a.	67.9	64.1	67.4	72.8	62.7	73.8	70.8	77.5	82.3	70.4	80.0	79.3	85.1	88.4	(1)	100.0
Altanta, GA[7]	53.9	55.6	60.5	60.0	54.6	60.3	61.5	67.0	67.9	68.4	66.1	67.3	72.1	73.1	73.0	74.5	88.9
Atlantic City, NJ	57.0	62.3	56.7	58.5	63.1	62.8	69.5	71.8	72.5	75.0	69.3	75.7	79.5	83.0	86.7	[2]83.0	[2]97.0
Augusta, GA-SC	48.8	48.8	55.2	47.9	47.2	59.1	60.6	63.5	60.9	66.5	68.0	70.2	72.3	73.8	78.6	(1)	93.6
Austin, TX	44.6	46.1	45.6	47.2	54.5	60.6	63.4	61.6	64.5	70.7	77.7	82.6	84.8	86.7	86.5	(1)	(1)
Bakersfield, CA	31.1	31.4	35.8	35.5	40.8	39.4	39.8	46.1	45.7	51.4	50.3	53.4	60.5	61.3	67.2	61.0	76.9
Baltimore, MD	47.9	49.9	53.9	55.0	57.0	50.2	55.4	61.3	64.5	67.6	54.8	60.5	67.3	70.0	72.7	(1)	83.2
Baton Rouge, LA[7]	52.9	61.8	61.0	45.7	47.2	59.4	70.7	71.6	62.1	62.7	67.0	76.7	80.0	74.0	72.8	(1)	87.2
Battle Creek, MI	n.a.	n.a.	n.a.	n.a.	52.6	n.a.	n.a.	n.a.	n.a.	(1)	n.a.	n.a.	n.a.	n.a.	84.2	[3]69.0	92.0
Bay City, MI	38.3	48.0	52.2	65.0	68.0	46.7	61.9	66.9	76.3	81.0	57.5	72.9	77.5	84.7	88.6	86.0	100.0
Beaumont-Port Arthur-Orange, TX	37.0	41.1	41.6	38.1	34.3	44.5	46.8	48.5	46.4	46.4	56.6	57.4	59.2	61.3	64.1	56.8	76.1

Billngs, MT	49.6	47.9	51.6	42.4	54.9	63.1	64.5	66.2	63.6	(1)	77.9	80.8	86.2	88.6	94.0	72.0	100.0
Biloxi-Gulfport, MS [7]	n.a.	n.a.	n.a.	60.1	51.0	n.a.	n.a.	n.a.	71.1	70.0	n.a.	n.a.	n.a.	81.4	80.1	(1)	100.0
Binghamton, NY-PA	53.8	51.4	52.0	50.6	41.8	64.2	67.3	67.9	67.0	67.2	69.7	77.3	77.6	80.0	81.0	(1)	(1)
Birmingham, AL	42.1	46.1	42.0	37.7	47.7	47.1	55.9	53.7	47.2	58.4	55.7	63.6	64.3	58.3	67.1	(1)	78.5
Bloomington-Normal, IL	n.a.	n.a.	n.a.	48.6	57.0	n.a.	n.a.	n.a.	62.7	72.6	n.a.	n.a.	n.a.	83.9	91.5	(1)	100.0
Boise City, ID	47.1	40.7	63.9	63.4	65.2	59.8	55.5	74.2	77.8	80.8	74.8	76.4	87.4	90.5	92.2	85.7	100.0
Boston, MA	56.2	47.6	49.7	47.4	49.0	63.6	58.5	60.0	57.2	63.1	76.7	64.4	66.0	66.2	71.3	60.5	(1)
Bridgeport, CT	n.a.	56.2	52.3	45.4	43.5	57.1	64.3	67.6	64.6	69.4	64.7	72.4	74.5	77.1	81.5	[3] 55.0	[3] 88.0
Bristol, CT	n.a.	n.a.	n.a.	n.a.	55.3	n.a.	n.a.	n.a.	n.a.	83.4	n.a.	n.a.	n.a.	n.a.	97.0	63.7	96.1
Brockton, MA [7]	46.0	61.8	59.0	62.0	68.5	63.9	72.5	74.3	77.5	81.1	74.0	80.8	83.7	87.9	91.7	81.7	[2] 97.0
Brownsville-Harlingen-San Benito, TX	30.7	33.0	39.3	47.1	44.0	41.3	48.0	53.4	58.6	63.1	58.4	66.2	71.5	77.0	80.2	[3] 60.0	[3] 85.0
Bryan-College, Station, TX	n.a.	n.a.	n.a.	n.a.	57.9	n.a.	n.a.	n.a.	n.a.	77.2	n.a.	n.a.	n.a.	n.a.	87.1	(1)	100.0
Buffalo, NY	59.8	56.4	46.9	41.0	38.2	62.0	58.7	53.7	51.7	49.9	65.3	63.3	63.1	62.9	61.4	45.7	60.4
Burlington, NC	n.a.	n.a.	n.a.	n.a.	54.8	n.a.	n.a.	n.a.	n.a.	73.1	n.a.	n.a.	n.a.	n.a.	83.9	72.3	96.6
Canton, OH	30.0	39.2	39.0	33.5	33.7	42.2	53.5	52.0	48.1	53.9	59.6	65.7	69.2	74.5	80.4	43.9	67.7
Cedar Rapids, IA	45.1	55.9	63.9	80.7	81.1	57.4	75.1	78.0	86.2	90.0	67.9	83.8	87.5	93.2	96.5	[2] 94.0	100.0
Champaign-Urbana-Rantoul, IL	58.2	61.0	50.5	51.5	66.1	66.8	71.9	65.6	67.4	80.7	77.1	87.4	87.4	89.9	95.3	(1)	[2] 96.0
Charleston, SC [6]	28.8	35.6	35.2	33.7	26.3	45.4	51.7	50.9	53.7	48.1	58.5	66.2	64.8	72.0	71.6	[3] 36.0	[3] 64.0
Charleston, WV	54.4	59.1	56.8	51.9	51.1	58.4	65.5	63.9	59.6	57.6	64.8	71.9	73.6	72.9	71.3	(1)	(1)
Charlotte-Gastonia, NC [7]	50.1	58.4	57.0	49.7	48.6	58.2	65.9	67.6	68.5	65.6	66.6	72.9	75.1	76.2	77.7	65.5	(1)
Chattanooga, TN-GA [6]	38.2	35.6	43.8	49.3	43.9	51.1	47.6	54.9	58.6	55.1	61.4	57.7	69.6	73.1	72.3	56.6	71.3
Chicago, IL	49.0	51.9	51.9	53.6	57.2	57.7	59.3	61.4	63.0	66.4	59.3	62.7	65.5	68.0	70.6	68.9	79.3
Cincinnati, OH-KY-IN	49.7	51.4	49.0	46.7	49.9	51.7	53.9	53.0	56.2	63.3	54.9	58.4	59.2	65.8	70.4	(1)	85.8
Cleveland, OH	51.1	53.0	56.0	58.4	51.9	57.1	61.6	61.8	68.1	65.8	60.8	66.8	67.6	73.3	72.3	67.8	(1)
Colorado Springs, CO	58.1	66.2	69.8	59.4	64.3	71.3	80.8	88.7	83.3	85.6	82.4	89.8	96.2	95.4	96.3	76.6	98.1
Columbia, MO	n.a.	n.a.	n.a.	n.a.	45.7	n.a.	n.a.	n.a.	n.a.	68.5	n.a.	n.a.	n.a.	n.a.	95.2	53.9	[2] 79.0
Columbia, SC	49.1	47.7	51.4	48.1	42.9	58.1	53.7	57.2	54.8	53.7	69.0	63.4	67.3	67.2	73.4	[3] 60.0	73.8
Columbus, GA-AL	36.4	41.3	37.3	34.0	32.6	48.5	50.3	51.2	45.2	46.1	59.4	62.7	67.4	62.2	69.8	(1)	73.4
Columbus, OH [6]	54.9	56.9	53.2	52.9	50.7	58.6	61.9	59.6	66.4	67.7	62.9	69.1	67.5	73.6	74.2	66.1	81.9
Corpus Christi, TX	42.9	51.8	53.4	50.7	54.3	51.0	63.2	69.7	61.9	67.3	61.4	75.7	83.3	80.0	81.1	(1)	(1)
*Dallas-Fort Worth, TX [5]	n.a.	n.a.	n.a.	n.a.	46.6	n.a.	n.a.	n.a.	n.a.	65.6	n.a.	n.a.	n.a.	n.a.	74.6	65.2	87.4
Danbury, CT	n.a.	n.a.	n.a.	n.a.	55.3	n.a.	n.a.	n.a.	n.a.	76.7	n.a.	n.a.	n.a.	n.a.	91.6	67.0	91.0
Davenport-Rock Island-Moline, IA-IL	50.2	55.1	54.1	57.2	67.0	58.5	63.3	65.1	71.4	80.6	67.4	72.6	76.3	80.9	88.4	81.4	[2] 97.0
*Dallas, TX	53.1	47.1	45.7	41.9	n.a.	63.4	58.3	61.4	60.4	n.a.	67.6	66.2	69.9	72.2	n.a.	n.a.	n.a.
*Fort Worth, TX	49.6	46.4	37.1	60.0	n.a.	59.7	55.4	49.5	69.5	n.a.	69.9	68.8	72.9	78.6	n.a.	n.a.	n.a
Dayton, OH	45.9	45.2	43.2	37.0	40.9	56.7	54.9	51.0	46.2	51.4	63.6	63.8	61.3	60.8	71.0	50.6	65.0
Daytona Beach, FL	n.a.	n.a.	n.a.	n.a.	65.4	n.a.	n.a.	n.a.	n.a.	77.8	n.a.	n.a.	n.a.	n.a.	86.7	(1)	100.0
Decatur, IL	54.2	64.5	63.2	63.3	73.6	67.6	74.6	75.6	76.5	87.7	79.0	85.6	87.7	90.1	96.8	[3] 89.0	100.0
Denver-Boulder, CO	67.1	66.9	70.4	66.0	80.5	72.9	72.3	75.7	74.9	88.3	77.9	77.9	81.3	84.2	91.9	[3] 91.0	96.5
Des Moines, IA	36.9	41.4	33.9	44.4	69.4	44.8	51.3	49.3	59.1	81.3	56.0	66.3	71.3	80.4	89.4	80.4	[2] 94.0
Detroit, MI	38.5	49.9	52.1	49.4	49.8	45.5	57.9	62.1	69.8	(1)	50.5	62.3	66.6	73.3	75.0	[3] 62.0	(1)
Dubuque, IA	43.8	54.6	65.5	57.7	79.4	54.0	65.4	75.2	74.3	87.9	66.9	79.1	88.0	86.5	95.4	89.8	100.0
Duluth-Superior, MN-WI	28.1	33.4	34.5	34.4	43.2	33.9	39.4	44.8	47.0	55.8	44.3	51.8	60.8	65.6	72.9	(1)	(1)
El Paso, TX	53.9	53.5	53.0	48.1	54.1	60.4	63.0	61.7	59.7	66.0	70.6	76.1	75.9	78.1	81.3	78.8	(1)
Elmira, NY	n.a.	n.a.	n.a.	n.a.	46.5	n.a.	n.a.	n.a.	n.a.	73.9	n.a.	n.a.	n.a.	n.a.	89.2	59.8	94.1
Erie, PA	52.0	58.2	49.3	48.0	43.9	58.9	63.3	57.9	58.2	57.4	66.8	71.3	71.0	72.6	75.3	(1)	(1)
Eugene-Springfield, OR	39.0	54.7	64.9	55.3	46.9	50.7	63.6	76.1	67.5	58.0	64.1	74.7	87.5	79.7	76.9	62.3	77.1
Evansville, IN-KY [6]	42.4	43.8	42.7	40.1	41.4	54.4	55.5	55.0	62.6	53.5	64.6	70.6	71.9	80.7	71.4	52.1	[2] 66.0

See footnotes at end of table.

APPENDIX TABLE F.1.—CONCENTRATION OF GROCERY STORE AND SUPERMARKET SALES BY 4, 8, AND 20 LARGEST FIRMS, 263 SMSAs, 1954, 1958, 1963, 1967, AND 1972—Continued

Standard metropolitan statistical area	Percentage of grocery store sales accounted for by—															Percentage of 1972 supermarke sales by top–	
	Top 4 grocery store companies					Top 8 grocery store companies					Top 20 grocery store companies						
	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	4 firms	8 firms
Fall River, MA-RI	53.7	54.6	56.4	61.2	57.9	59.2	68.6	67.8	76.3	(1)	67.8	75.6	76.6	87.1	90.7	72.7	97.5
Fargo-Moorhead, ND-MN	42.1	44.1	49.9	55.2	53.6	53.8	60.9	65.2	72.2	71.3	65.7	74.9	78.9	84.7	87.3	70.3	(1)
Fayetteville, NC	n.a.	n.a.	n.a.	56.4	48.9	n.a.	n.a.	n.a.	63.4	64.2	n.a.	n.a.	n.a.	73.8	77.0	(1)	100.0
Fayetteville-Springdale, AR	n.a.	n.a.	n.a.	n.a.	42.2	n.a.	n.a.	n.a.	n.a.	(1)	n.a.	n.a.	n.a.	n.a.	79.4	(1)	80.8
Fitchburg-Leominster, MA	n.a.	41.6	37.1	42.4	44.4	n.a.	66.7	58.9	67.4	65.9	n.a.	81.8	82.6	89.5	91.5	55.5	82.4
Flint, MI	43.4	53.6	53.1	60.6	45.5	50.6	62.4	63.4	67.6	61.8	60.0	71.9	72.6	77.4	75.7	[3]57.0	(1)
Florence, AL	n.a.	n.a.	n.a.	n.a.	41.4	n.a.	n.a.	n.a.	n.a.	59.8	n.a.	n.a.	n.a.	n.a.	73.2	77.8	100.0
Fort Lauderdale-Hollywood, FL	72.3	70.5	65.5	68.6	69.4	78.8	78.7	79.7	81.0	(1)	84.2	87.5	88.9	89.0	91.2	85.6	97.2
Fort Myers, FL	n.a.	n.a.	n.a.	n.a.	62.8	n.a.	n.a.	n.a.	n a.	76.4	n a.	n.a.	n.a.	n.a.	88.7	83.3	97.7
Fort Smith, AR-OK	39.1	48.3	34.6	43.8	39.5	56.4	65.7	47.4	55.5	49.0	75.4	80.5	63.9	66.1	65.3	67.6	83.8
Fort Wayne, IN [7]	55.0	60.8	52.8	62.9	56.5	63.7	81.8	72.5	83.5	72.3	71.3	88.3	79.7	93.3	86.5	[3]67.0	82.7
Fresno, CA	22.7	27.7	23.5	24.6	27.2	33.4	37.1	37.2	36.7	38.3	46.1	51.8	55.6	54.4	57.5	[3]41.0	58.6
Gadsden, AL	35.8	44.6	37.5	38.9	44.8	41.8	55.9	51.3	55.1	61.9	51.7	68.5	65.2	70.3	80.1	[3]62.0	[2]88.0
Gainesville, FL	n.a.	n.a.	n.a.	n.a.	61.8	n.a.	n.a.	n.a.	n.a.	75.7	n.a.	n.a.	n.a.	n.a.	89.4	85.4	97.6
Galveston-Texas City, TX	27.0	34.2	40.3	37.7	44.2	39.9	46.9	51.9	51.2	53.1	59.3	68.0	70.8	71.8	73.2	67.7	78.1
Gary-Hammond-East Chicago, IN	38.9	34.4	29.3	33.9	35.8	43.7	43.4	47.8	52.3	57.4	53.0	59.0	68.2	73.7	76.5	(1)	(1)
Great Falls, MI	40.3	44.9	44.0	52.0	67.8	46.8	52.0	82.6	62.5	74.4	55.9	61.8	65.4	74.3	82.5	79.0	86.7
Great Falls, MT	48.4	63.0	75.6	69.1	67.6	60.4	71.4	82.6	80.2	82.1	79.0	82.4	92.6	90.6	93.5	86.7	100.0
Green Bay, WI	45.2	50.1	56.5	57.6	67.2	59.0	67.5	68.0	68.3	76.5	72.3	82.0	84.3	86.5	92.5	[4]84.0	[4]94.0
Greensboro-Winston-Salem-Hight Point, NC	n.a.	n.a.	n.a.	37.9	36.5	n.a.	n.a.	n.a.	54.4	52.7	n.a.	n.a.	n.a.	65.5	67.5	(1)	76.3
Greenville-Spartanburg, SC [7]	49.1	57.7	55.6	57.9	63.4	57.4	68.8	67.3	70.3	72.8	66.3	78.3	77.2	80.3	80.5	[3]86.0	96.5
Hamilton-Middletown, OH	37.6	55.0	50.5	46.6	51.6	45.1	62.8	66.2	63.9	69.5	54.4	72.2	76.7	79.0	82.7	[3]72.0	91.2
Harrisburg, PA	49.7	48.1	50.9	56.0	51.1	56.3	58.6	60.5	68.5	64.9	62.4	69.6	71.2	78.2	77.6	[4]69.0	[4]84.0
Hartford, CT	n.a.	48.6	48.4	47.9	40.9	56.2	60.7	63.8	63.6	54.0	64.7	68.6	72.6	75.3	69.6	(1)	(1)
Honolulu, HI	29.7	37.8	44.3	48.5	53.6	36.8	49.1	55.6	65.7	67.8	47.9	61.8	67.4	75.1	81.0	66.2	[4]83.0
Houston, TX	35.5	33.2	35.1	32.2	34.7	42.3	41.5	42.5	42.0	44.3	49.4	49.3	49.8	52.0	58.7	[3]50.0	63.1
Huntington-Ashland, WV.-KY-OH [6]	37.2	47.5	38.8	32.0	29.2	44.1	53.6	46.6	44.9	41.8	53.2	62.9	58.5	60.2	58.9	42.0	[2]62.0
Huntsville, AL	30.8	34.3	49.9	55.4	48.6	42.4	50.1	58.6	66.1	61.1	53.0	64.7	70.1	78.4	74.2	[3]74.0	[3]91.0
Indianapolis, IN	48.5	55.6	60.0	59.3	52.7	56.8	64.5	64.1	69.4	68.5	65.7	71.0	70.8	78.8	79.9	61.7	[2]81.0
Jackson, MI	46.8	54.0	52.5	56.8	63.0	53.4	65.2	65.1	74.5	78.5	64.1	76.2	77.8	85.3	88.3	(1)	97.9
Jackson, MS	51.5	48.9	55.9	51.8	55.9	60.8	64.6	66.0	65.3	69.1	67.9	73.9	75.8	75.6	78.8	(1)	95.9
Jacksonville, FL [6]	52.0	62.7	61.3	61.0	56.2	67.5	75.5	74.9	78.8	74.7	78.0	81.2	82.2	85.2	82.2	82.5	(1)
Jersey City, NJ	54.3	52.0	44.3	43.2	44.2	60.8	59.0	54.8	58.6	61.6	66.4	64.4	66.9	73.2	74.9	(1)	(1)
Johnstown, PA	n.a.	55.8	56.8	56.3	53.4	52.5	60.7	63.9	64.3	64.6	58.4	86.0	71.3	74.4	75.5	[2]74.0	[2]93.0
Kalamazoo-Portage, MI [7]	33.4	41.9	56.7	72.2	64.9	45.8	59.6	70.6	87.1	78.5	63.0	74.8	82.8	93.3	89.7	(1)	(1)
Kansas City, MO-KS	48.1	49.8	49.1	41.8	49.3	52.7	57.3	55.4	49.6	56.7	59.6	66.1	65.0	63.5	68.4	59.2	67.6
Kenosha, WI	45.3	44.6	44.1	46.5	54.5	54.0	58.3	58.8	67.0	73.7	64.0	73.8	70.1	82.6	85.9	73.7	100.0
Killeen-Temple, TX	n.a.	n.a.	n.a.	n.a.	40.1	n.a.	n.a.	n.a.	n.a.	56.8	n.a.	n.a.	n.a.	n.a.	75.8	[3]67.0	88.2

Kingsport-Bristol, TN-VA	n.a.	n.a.	n.a.	n.a.	35.6	n.a.	n.a.	n.a.	n.a.	49.3	n.a.	n.a.	n.a.	n.a.	67.7	56.8	(1)
Knoxville, TN	48.3	55.5	60.1	56.2	53.9	54.2	59.4	65.4	63.8	(1)	61.3	66.5	72.6	72.9	70.5	(1)	89.7
LaCrosse, WI	n.a.	n.a.	n.a.	n.a.	47.7	n.a.	n.a.	n.a.	n.a.	68.1	n.a.	n.a.	n.a.	n.a.	87.2	68.2	97.4
Lafayette, LA	38.1	52.2	55.7	52.4	41.0	45.4	59.3	63.2	62.3	61.0	58.6	70.7	76.3	73.4	(1)	69.8	100.0
Lafayette-W. Lafayette, IN	n.a.	n.a.	n.a.	56.9	72.1	n.a.	n.a.	n.a.	68.4	(1)	n.a.	n.a.	n.a.	96.6	98.7	82.8	100.0
Lake Charles, LA	33.4	44.9	41.7	50.8	45.0	42.7	56.7	56.8	65.6	62.2	55.9	69.4	71.2	78.7	78.2	73.7	96.8
Lakeland-Winter Haven, FL	n.a.	n.a.	n.a.	n.a.	57.5	n.a.	n.a.	n.a.	n.a.	70.7	n.a.90	n.a.	n.a.	n.a.	81.9	85.9	[4]98.0
Lancaster, PA	42.4	45.7	48.1	49.2	45.8	48.3	52.2	55.0	56.3	55.8	56.9	62.3	64.4	68.2	70.6	73.2	85.1
Lansing-East Lansing, MI [6]	48.2	36.1	32.1	41.1	42.8	56.5	48.4	47.3	55.0	59.7	66.2	62.9	61.5	68.2	74.2	[3]59.0	78.4
Laredo, TX	48.5	48.8	45.1	53.4	56.6	65.0	63.2	60.5	71.3	73.9	81.5	81.7	81.6	87.6	(1)	78.0	100.0
Las Vegas, NV	46.4	46.6	52.8	61.2	57.5	62.6	64.5	71.8	83.6	81.6	85.9	86.6	90.1	94.2	93.3	67.2	94.3
Lawrence-Haverhill, MA-NH	43.0	46.6	43.0	51.7	55.7	52.4	55.2	60.1	64.1	69.8	61.1	67.0	75.1	80.7	85.7	(1)	83.8
Lawton, OK	54.0	48.9	50.0	52.0	58.9	60.9	62.0	64.3	68.0	73.7	73.3	78.6	82.9	87.2	87.3	[2]88.0	100.0
Lewiston-Auburn, ME	n.a.	30.8	33.0	38.9	60.1	n.a.	46.8	50.8	56.3	69.9	n.a.	62.9	69.7	74.3	81.9	[2]92.0	100.0
Lexington, KY [7]	47.1	54.9	61.2	59.0	60.4	54.3	64.1	70.6	72.8	70.5	68.5	77.1	81.7	82.3	78.6	(1)	95.4
Lima, OH [7]	50.4	52.2	72.1	56.4	52.1	60.8	68.1	80.3	65.4	63.4	71.6	78.9	87.6	79.4	78.0	79.1	93.2
Lincoln, NE	44.2	50.8	54.2	51.9	57.3	54.1	62.6	66.7	62.7	72.4	70.5	79.0	83.9	81.4	(1)	65.4	82.7
Little Rock, AR	51.4	n.a.	55.1	62.7	61.8	54.9	59.3	62.1	67.3	67.2	60.8	66.4	70.0	75.4	77.3	[2]86.0	[2]93.0
Long Branch-Asbury Park, NJ	n.a.	n.a.	n.a.	n.a.	53.4	n.a.	n.a.	n.a.	n.a.	73.2	n.a.	n.a.	n.a.	n.a.	89.8	60.0	82.9
Lorain-Elyria, OH	44.5	54.6	53.9	45.6	42.5	53.5	62.4	62.8	61.2	64.8	63.7	72.4	74.3	78.7	83.1	56.2	79.7
Los Angeles-Long Beach, CA	29.6	24.6	30.3	28.5	35.6	40.6	39.6	43.1	46.3	53.8	53.0	54.8	60.5	67.8	71.9	41.4	62.6
Louisville, KY-IN	51.2	57.7	60.3	55.8	54.8	55.1	62.2	65.0	62.1	61.3	59.7	67.5	71.3	69.5	68.4	[3]76.0	84.5
Lowell, MA-NH	40.0	38.8	37.2	58.5	71.6	52.0	58.6	58.8	71.7	81.5	64.8	72.4	77.8	86.4	89.5	(1)	100.0
Lubbock, TX	58.0	60.1	62.7	64.5	69.4	62.8	65.8	71.0	77.2	81.9	71.5	75.1	81.7	86.4	89.9	84.3	97.9
Lynchburg, VA	38.7	39.5	40.9	39.4	40.9	43.6	49.0	51.4	53.6	56.8	54.2	60.8	63.8	69.3	73.4	[3]65.0	[2]91.0
Macon, GA	38.0	43.1	47.6	48.8	50.3	53.2	58.0	62.8	65.2	63.8	66.3	71.2	76.1	78.9	78.0	[2]79.0	[2]95.0
Madison, WI	41.5	43.2	40.6	40.4	47.4	52.6	54.6	55.9	52.9	62.5	62.6	66.4	70.1	70.1	77.4	64.0	(1)
Manchester, NH [6]	41.6	46.4	43.7	47.1	33.5	51.1	54.4	61.4	60.0	52.0	61.5	66.8	73.3	75.0	73.3	48.8	75.7
Mansfield, OH	n.a.	n.a.	n.a.	54.6	50.8	n.a.	n.a.	n.a.	70.7	73.9	n.a.	n.a.	n.a.	87.9	91.7	[2]65.0	[2]95.0
McAllen-Pharr-Edinburgh, TX	n.a.	n.a.	n.a.	37.9	41.7	n.a.	n.a.	n.a.	46.1	50.4	n.a.	n.a.	n.a.	61.8	65.9	83.5	96.5
Melbourne-Titusville-Cocoa, FL	n.a.	n.a.	n.a.	n.a.	79.0	n.a.	n.a.	n.a.	n a.	89.4	n.a.	n.a.	n.a.	n.a.	94.8	[2]97.0	100.0
Memphis, TN-AR-MS	23.1	32.7	28.9	35.9	41.4	30.8	40.0	42.8	49.3	54.5	40.2	50.3	55.9	59.6	64.2	61.8	(1)
Meriden, CT	57.4	60.8	67.1	68.2	67.5	65.9	70.9	78.9	79.6	86.3	80.0	84.0	91.2	91.8	94.2	85.2	100.0
Miami, FL	55.5	62.6	53.5	60.5	62.8	69.4	73.0	73.6	74.1	72.3	76.7	79.3	80.2	80.4	78.1	[2]85.0	[2]91.0
Midland, TX	51.0	49.9	56.5	50.6	63.7	66.2	66.4	66.9	66.3	78.8	89.3	89.6	85.8	88.2	90.8	93.6	100.0
Milwaukee, WI	42.6	46.7	39.9	31.6	57.4	47.5	51.7	47.3	41.6	66.9	55.3	60.6	56.6	52.5	73.5	67.4	77.9
Minneapolis-St. Paul, MN-WI	31.4	38.5	39.3	43.6	42.4	38.1	44.3	48.7	54.3	55.4	46.9	52.6	60.7	63.7	65.4	[3]54.0	(1)
Mobile, AL	43.6	48.0	46.2	50.6	42.0	56.8	59.2	61.7	66.3	62.1	66.1	73.7	72.8	78.6	74.9	60.9	(1)
Modesto, CA	n.a.	n.a.	n.a.	n.a.	42.5	n.a.	n.a.	n.a.	n.a.	58.9	n.a.	n.a.	n.a.	n.a.	79.2	(1)	78.8
Monroe, LA	37.5	39.1	55.0	51.0	46.6	52.4	52.1	69.7	65.0	68.3	64.8	68.4	84.1	78.7	86.5	(1)	(1)
Montgomery, AL [6]	49.9	62.5	53.7	55.8	56.0	58.8	68.4	63.7	68.2	70.2	67.0	75.9	73.2	78.2	82.0	75.4	[2]95.0
Muncie, IN	39.4	60.4	44.6	61.0	68.2	55.4	71.5	65.5	77.1	84.3	75.4	85.1	85.8	93.5	94.6	(1)	97.6
Muskegon-Muskegon Heights, MI [6]	40.1	47.5	49.7	60.2	56.6	47.7	56.3	59.3	69.5	67.2	58.1	67.5	72.2	81.2	81.4	75.0	(1)
Nashua, NH	n.a.	n.a.	n.a.	n.a.	51.8	n.a.	n.a.	n.a.	n.a.	70.2	n.a.	n.a.	n.a.	n.a.	87.9	64.9	87.9
Nashville-Davidson, TN [7]	50.4	59.0	52.1	58.2	47.5	59.2	67.1	56.2	62.2	52.3	66.8	74.0	62.4	69.2	60.6	(1)	(1)
Nassau-Suffolk, NY	n.a.	n.a.	n.a.	n.a.	45.7	n.a.	n.a.	n.a.	n.a.	70.8	n.a.	n.a.	n.a.	n.a.	82.7	(1)	(1)
New Bedford, MA	38.4	44.0	40.5	51.5	60.2	54.5	59.9	63.9	71.9	(1)	66.7	69.8	74.5	81.1	87.5	79.7	100.0
New Britain, CT	51.8	46.4	50.6	47.8	44.2	59.9	60.3	71.1	68.9	66.6	69.1	74.0	84.4	85.1	89.7	(1)	(1)

See footnotes at end of table.

APPENDIX TABLE F.1.—CONCENTRATION OF GROCERY STORE AND SUPERMARKET SALES BY 4, 8, AND 20 LARGEST FIRMS, 263 SMSAs, 1954, 1958, 1963, 1967, AND 1972—Continued

Standard metropolitan statistical area	Percentage of grocery store sales accounted for by—															Percentage of 1972 supermarket sales by top—	
	Top 4 grocery store companies					Top 8 grocery store companies					Top 20 grocery store companies						
	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	4 firms	8 firms
New Brunswick-Perth Amboy-Sayre, NJ	n.a.	n.a.	n.a.	n.a.	45.9	n.a.	n.a.	n.a.	n.a.	64.8	n.a.	n.a.	n.a.	n.a.	85.4	[3] 52.0	[2] 75.0
New Haven-West Haven, CT [6]	38.4	44.0	48.2	54.4	51.3	47.1	52.9	60.8	66.4	64.9	56.2	64.5	71.3	76.2	76.6	(1)	(1)
New London-Norwich, CT-RI [6]	n.a.	n.a.	53.8	58.1	51.3	n.a.	n.a.	66.3	74.6	70.5	n.a.	n.a.	77.8	85.0	87.7	(1)	84.1
New Orleans, LA	36.0	44.8	52.0	54.4	59.6	41.7	55.2	58.6	61.6	67.1	50.5	64.2	67.5	71.4	75.2	[3] 76.0	84.0
New York, NY-NJ [6]	41.1	36.7	34.5	33.0	30.9	47.6	45.4	47.6	45.0	45.6	54.7	54.4	56.9	58.7	56.7	39.9	58.7
Newark, NJ [6]	52.8	47.9	40.2	42.5	44.2	60.1	56.4	51.5	57.7	57.6	66.1	65.8	65.1	72.0	73.5	50.2	(1)
Newport News-Hampton, VA [7]	62.0	63.6	60.1	60.5	56.7	70.2	76.4	76.2	82.0	78.4	77.3	84.3	88.5	92.7	90.2	70.8	(1)
Norfolk-Virginia Beach-Portsmouth, VA-NC	48.7	39.1	46.1	51.6	48.7	55.5	49.8	56.3	67.3	67.6	63.9	65.6	71.6	83.4	84.3	60.5	78.6
Northeast Pennsylvania [5]	n.a.	n.a.	n.a.	n.a.	53.0	n.a.	n.a.	n.a.	n.a.	62.0	n.a.	n.a.	n.a.	n.a.	70.1	(1)	[2] 88.0
Norwalk, CT	n.a.	n.a.	65.0	59.4	56.9	n.a.	n.a.	77.8	79.8	78.6	n.a.	n.a.	87.5	90.5	88.3	(1)	97.5
Odessa, TX	50.2	49.8	51.8	52.1	47.2	68.5	66.9	71.6	77.4	75.8	86.3	82.4	92.3	90.8	92.1	64.9	100.0
Oklahoma City, OK	40.3	40.0	40.2	38.8	35.8	45.5	46.7	46.9	46.7	44.6	56.7	59.1	58.9	60.3	58.0	45.5	55.5
Omaha, NE-IA	38.9	45.1	53.5	55.7	62.0	43.9	51.7	61.7	69.7	73.0	54.1	62.8	71.1	80.5	84.0	(1)	(1)
Orlando, FL	63.2	62.5	63.8	61.0	65.7	68.1	70.6	75.6	76.2	80.5	76.1	79.0	83.8	86.8	89.4	[3] 84.0	[2] 96.0
*Scranton, PA	50.2	47.6	50.6	55.2	n.a.	53.7	62.3	61.6	67.2	n.a.	58.8	69.4	69.0	75.1	n.a.	n.a.	n.a.
*Wilkes-Barre, PA	49.1	54.9	55.7	58.5	n.a.	52.7	61.3	61.6	65.1	n.a.	57.4	66.8	67.5	73.0	n.a.	n.a.	n.a.
Ownesboro, KY	n.a.	n.a.	n.a.	n.a.	54.8	n.a.	n.a.	n.a.	n.a.	72.8	n.a.	n.a.	n.a.	n.a.	87.5	75.3	100.0
Oxnard-Simi Valley-Ventura, CA	n.a.	n.a.	n.a.	46.4	46.4	n.a.	n.a.	n.a.	62.8	68.4	n.a.	n.a.	n.a.	82.1	85.8	53.9	79.5
Parkersburg-Marietta, WV-OH	n.a.	n.a.	n.a.	n.a.	45.6	n.a.	n.a.	n.a.	n.a.	62.4	n.a.	n.a.	n.a.	n.a.	82.0	(1)	78.3
Paterson-Clifton-Passaic, NJ [7]	64.2	60.6	48.6	51.1	46.6	68.4	66.9	59.3	61.5	63.2	73.8	73.6	71.9	77.0	87.5	(1)	(1)
Pensacola, FL	37.4	49.7	43.1	42.7	40.4	48.3	60.5	59.7	58.3	64.8	60.5	72.6	76.7	76.5	82.1	(1)	(1)
Peoria, IL	38.4	45.8	37.9	36.2	36.7	45.6	52.8	52.8	51.4	55.9	57.5	66.5	67.7	67.9	72.9	47.7	(1)
Petersburg-College Heights-Hopewell, VA	n.a.	n.a.	n.a.	n.a.	50.2	n.a.	n.a.	n.a.	n.a.	68.0	n.a.	n.a.	n.a.	n.a.	83.4	77.7	97.2
Philadelphia, PA-NJ	52.6	60.3	60.7	59.8	54.1	56.9	63.3	63.7	67.4	64.6	59.0	65.9	67.1	71.7	71.7	(1)	82.9
Phoenix, AZ	45.4	46.1	46.6	39.8	47.9	50.9	57.9	63.5	62.7	72.2	60.6	70.1	78.0	83.8	86.7	61.4	(1)
Pine Bluff, AR	39.7	48.7	43.5	58.6	58.0	51.2	60.7	54.6	67.5	67.4	63.9	73.4	71.8	79.4	81.7	91.5	100.0
Pittsburgh, PA	45.0	53.2	51.7	45.0	43.4	50.6	60.9	59.7	54.0	49.5	55.6	66.7	65.0	60.8	57.1	55.5	[3] 64.0
Pittsfield, MA [6]	57.5	61.3	69.7	66.7	61.9	67.1	73.1	81.0	83.0	82.0	79.6	84.2	90.0	92.4	91.9	76.1	99.0
Portland, ME [6]	43.1	41.2	44.0	40.1	50.1	49.6	53.6	56.8	57.0	62.9	60.5	67.1	73.0	75.2	77.2	(1)	83.1
Portland, OR-WA	39.6	43.1	35.3	40.7	53.7	45.8	48.7	48.5	55.6	63.5	55.1	57.1	58.4	66.4	74.9	(1)	78.0
Poughkeepsie, NY	n.a.	n.a.	n.a.	n.a.	73.0	n.a.	n.a.	n.a.	n.a.	84.9	n.a.	n.a.	n.a.	n.a.	90.9	(1)	[2] 98.0
Providence-Warwick-Pawtucket, RI-MA	48.7	48.9	50.9	58.5	59.1	54.0	58.5	65.9	74.9	75.9	60.3	67.2	72.2	80.5	83.7	[3] 75.0	[3] 95.0
Provo-Orem, UT	40.6	39.4	49.8	50.3	51.3	52.0	52.4	62.7	69.2	73.5	70.8	73.3	82.8	87.5	90.2	62.3	(1)
Pueblo, CO	50.1	53.4	62.0	60.2	70.3	60.1	66.4	75.1	75.6	86.2	74.1	82.1	86.0	90.8	95.3	[2] 93.0	100.0
Racine, WI	38.5	51.2	52.9	43.0	51.9	50.0	63.2	64.9	62.0	69.3	62.2	77.4	77.1	81.0	87.1	65.0	86.9
Raleigh-Durham, NC [5 7]	47.9	56.8	58.8	61.1	63.5	54.2	64.0	62.7	65.6	68.7	63.3	72.8	69.7	73.5	74.7	[2] 94.0	98.2
Reading, PA	46.9	44.8	48.0	46.7	42.5	55.2	53.4	60.3	57.6	58.2	63.4	64.7	70.3	70.8	73.5	60.0	(1)
Reno, NV	48.2	54.4	65.6	76.1	59.7	63.2	72.5	79.4	89.9	(1)	83.2	88.2	92.9	96.5	94.0	68.3	(1)

Richland-Kennewick, WA	n.a.	n.a.	n.a.	n.a.	57.1	n.a.	n.a.	n.a.	n.a.	(1)	n.a.	n.a.	n.a.	n.a.	92.6	(1)	100.0
Richmond, VA	50.5	47.9	49.9	50.4	45.2	57.9	57.7	60.4	62.2	65.9	65.2	69.7	72.4	77.8	81.1	[3] 59.0	83.9
Riverside-San Bernardino-Ontario, CA	29.8	37.2	38.1	41.6	45.5	36.9	46.5	55.9	62.2	62.4	52.8	59.0	68.3	71.2	74.4	59.1	78.0
Roanoke, VA [7]	58.8	62.7	66.8	69.2	62.9	63.6	68.6	75.9	78.6	73.1	72.0	76.9	82.2	86.1	83.4	89.0	98.6
Rochester, MN	n.a.	n.a.	n.a.	n.a.	76.6	n.a.	n.a.	n.a.	n.a.	91.3	n.a.	n.a.	n.a.	n.a.	98.2	91.8	100.0
Rochester, NY	58.5	65.7	55.5	56.2	59.3	62.0	69.2	61.9	64.2	67.7	66.0	73.5	67.6	72.0	74.6	73.2	(1)
Rockford, IL	43.9	50.8	41.0	42.1	50.7	52.2	60.1	57.4	64.2	66.8	62.6	74.0	76.6	82.5	85.5	(1)	(1)
Sacramento, CA	45.1	44.5	36.3	40.1	48.5	60.6	51.3	47.4	58.4	66.0	72.9	63.2	65.1	72.2	78.7	[3] 60.0	(1)
Saginaw, MI	29.9	37.0	46.9	51.3	58.3	36.6	50.2	58.1	64.0	69.0	47.9	61.5	68.8	76.1	79.3	[3] 77.0	[3] 91.0
St Cloud, MN	n.a.	n.a.	n.a.	n.a.	40.6	n.a.	n.a.	n.a.	n.a.	58.8	n.a.	n.a.	n.a.	n.a.	81.9	(1)	(1)
St Joseph, MO	42.7	45.8	51.7	50.6	51.2	53.0	61.2	69.4	70.8	73.7	66.8	76.5	83.6	87.0	91.2	63.3	91.1
St Louis, MO–IL	34.6	42.7	42.9	39.3	46.2	44.7	49.1	50.6	51.3	53.1	49.3	54.2	56.8	59.9	63.2	(1)	(1)
Salem, OR	n.a.	n.a.	n.a.	50.2	53.4	n.a.	n.a.	n.a.	63.2	64.4	n.a.	n.a.	n.a.	79.4	92.7	63.6	77.6
Salinas Seaside-Monterey, CA	n.a.	n.a.	n.a.	42.4	47.4	n.a.	n.a.	n.a.	56.9	57.4	n.a.	n.a.	n.a.	70.4	71.1	71.4	(1)
*Salt Lake City-Ogden, UT [5]	n.a.	n.a.	n.a.	n.a.	59.2	n.a.	n.a.	n.a.	n.a.	66.4	n.a.	n.a.	n.a.	n.a.	82.5	71.2	79.6
San Angelo, TX	65.5	66.3	59.8	56.2	58.6	72.6	75.2	71.0	74.3	75.8	83.3	87.6	83.5	90.4	89.5	92.2	100.0
San Antonio, TX	50.0	47.9	54.4	53.5	55.1	55.3	55.3	61.9	61.8	66.1	60.5	66.1	70.0	72.6	78.4	(1)	87.5
San Diego, CA	41.1	40.6	52.5	51.0	55.2	49.0	50.5	64.0	67.7	75.1	58.1	61.5	72.7	76.8	81.1	(1)	90.9
San Francisco-Oakland, CA	27.1	28.6	33.0	40.4	46.9	33.5	35.3	42.9	49.3	56.3	40.8	44.5	55.2	62.6	68.6	59.3	70.9
San Jose, CA	28.4	30.7	33.9	37.8	46.0	37.3	40.4	43.7	49.6	60.3	52.4	55.9	59.2	66.3	79.8	[3] 55.0	[3] 72.0
Santa Barbara-Santa Maria-Lompoc, CA	47.0	45.7	52.6	60.0	62.0	57.2	56.9	64.2	72.0	74.8	69.8	75.0	80.8	85.3	87.3	(1)	(1)
Santa Cruz, CA	n.a.	n.a.	n.a.	n.a.	49.5	n.a.	n.a.	n a.	n.a.	61.7	n.a.	n.a.	n.a.	n.a.	82.2	63.1	78.6
Santa Rosa, CA	n.a.	n.a.	n.a.	n.a.	51.7	n.a.	n.a.	n a.	n.a.	62.9	n.a.	n.a.	n.a.	n.a.	76.7	65.9	80.2
Sarasota, FL	n.a.	n.a.	n.a.	n.a.	73.2	n.a.	n.a.	n a.	n.a.	84.7	n.a.	n.a.	n.a.	n.a.	96.3	87.9	98.4
Savannah, GA	33.7	32.1	34.7	41.2	42.3	46.9	48.1	52.6	55.4	56.0	61.3	75.5	74.3	73.6	74.4	63.8	(1)
Seattle-Everett, WA	39.7	38.4	41.1	41.5	49.0	45.1	46.4	51.8	56.0	62.2	52.6	54.9	61.0	67.5	74.4	[3] 61.0	76.6
Sherman-Denison, TX	n.a.	n.a.	n.a.	50.5	57.7	n.a.	n.a.	n.a.	64.0	(1)	n.a.	n.a.	n.a.	76.4	(1)	100.0	100.0
Shreveport, LA [6]	48.6	57.1	54.4	51.8	45.5	52.7	62.2	64.6	64.8	62.3	59.6	70.7	75.6	83.6	(1)	59.4	(1)
Sioux City, IA-NE	42.8	46.3	44.1	49.3	45.9	58.9	60.0	56.2	65.0	64.8	68.9	74.8	75.3	81.4	84.2	(1)	(1)
Sioux Falls, SD	67.2	62.3	70.9	72.3	79.4	73.8	72.7	80.9	84.8	87.2	85.6	86.7	94.7	97.4	97.0	100.0	100.0
South Bend, IN	41.2	46.6	44.4	46.7	47.3	47.3	56.3	58.8	59.3	60.4	55.6	67.4	76.1	74.8	78.1	(1)	(1)
Spokane, WA	38.4	47.0	54.7	56.3	62.4	51.1	59.1	65.4	68.1	70.3	65.1	70.1	75.6	78.6	82.6	78.2	[3] 93.0
Springfield, IL	46.5	51.7	47.2	49.4	55.6	54.9	63.7	62.6	68.6	71.8	64.7	75.9	78.0	85.2	87.2	(1)	(1)
Springfield, MO	46.3	50.5	54.8	60.5	58.8	57.6	62.4	69.1	78.0	75.3	69.2	73.6	82.4	87.3	89.6	78.9	100.0
Springfield, OH [6]	50.5	58.9	49.6	56.6	44.2	63.7	69.9	63.6	74.1	62.3	72.9	79.6	79.7	89.2	83.6	(1)	(1)
Springfield-Chicopee-Holyoke, MA-CT	45.2	45.4	43.5	44.4	47.0	54.1	59.2	63.2	66.7	65.8	62.4	70.0	72.7	77.6	78.8	[3] 63.0	80.8
*Ogden, UT	52.0	61.5	60.2	(1)	n.a.	65.8	72.1	78.8	(1)	n.a.	80.7	86.0	90.5	(1)	n.a.	n.a.	n.a.
*Salt Lake City, UT	37.4	42.2	50.3	54.4	n.a.	44.6	50.3	56.8	64.5	n.a.	56.3	62.6	67.3	74.1	n.a.	n.a.	n.a.
Stamford, CT	53.8	59.9	45.9	46.2	43.4	65.0	73.8	62.1	59.5	(1)	75.4	83.8	84.5	82.3	90.8	[3] 50.0	76.3
Steubenville-Weirton, OH-WV	n.a.	59.5	55.2	57.3	43.2	n.a.	62.4	63.6	68.5	(1)	n.a.	67.8	71.3	76.5	76.3	66.3	84.1
Stockton, CA	23.8	25.4	26.1	28.3	33.9	34.8	37.9	38.2	43.3	(1)	50.4	56.9	59.5	65.3	70.2	51.8	74.3
Syracuse, NY	39.5	42.7	40.2	33.8	29.9	49.5	57.3	53.3	50.0	45.8	59.7	64.9	63.8	63.5	63.8	37.5	(1)
Tacoma, WA	33.7	39.5	41.3	46.0	49.1	43.8	53.1	56.9	62.9	67.7	57.6	66.0	72.8	78.9	82.5	64.5	[3] 90.0
Tallahasee, FL	n.a.	n.a.	n.a.	63.1	70.7	n.a.	n.a.	n.a.	77.1	82.4	n.a.	n.a.	n.a.	89.7	90.9	100.0	100.0
Tampa-St. Petersburg, FL	51.1	60.4	62.3	63.1	63.5	60.1	70.1	75.1	77.3	78.0	65.3	74.8	81.1	84.4	86.4	[3] 83.0	[3] 95.0
Terre Haute, IN	60.5	60.9	52.5	54.2	56.1	64.1	67.0	60.8	67.1	69.2	70.4	76.3	71.0	77.0	82.0	[3] 77.0	[3] 94.0
Texarkana, TX-Texarkana, AR	27.3	47.9	41.0	39.4	41.1	34.7	54.8	51.0	53.3	55.5	46.1	65.1	66.0	67.5	68.8	(1)	100.0
Toledo, OH-MI	47.8	52.6	59.4	62.5	55.0	58.1	62.6	67.8	74.9	68.2	67.1	74.1	76.2	81.9	76.8	(1)	(1)
Topeka, KS [6]	31.5	32.6	32.3	49.3	35.7	46.7	52.0	52.9	65.4	53.5	64.3	75.0	82.6	86.3	76.9	49.1	[3] 72.0
Trenton, NJ	63.9	61.3	59.9	53.6	50.1	67.7	70.0	72.3	73.0	73.0	72.1	79.8	79.8	84.4	87.3	(1)	(1)
Tucson, AZ	53.6	54.8	48.6	48.4	45.8	60.9	66.5	65.1	66.7	69.4	70.1	76.3	78.6	82.7	86.1	57.9	82.9
Tulsa, OK [6]	45.4	46.3	47.8	50.6	52.5	53.9	53.7	54.3	62.2	66.1	62.2	66.8	65.0	73.6	75.9	[3] 71.0	82.5
Tuscaloosa, AL	36.1	41.7	39.3	45.7	65.6	44.8	54.9	54.1	64.9	75.8	57.4	68.5	69.3	80.6	85.2	96.8	100.0

See footnotes at end of table.

APPENDIX TABLE F.1.—CONCENTRATION OF GROCERY STORE AND SUPERMARKET SALES BY 4, 8, AND 20 LARGEST FIRMS, 263 SMSAs, 1954, 1958, 1963, 1967, AND 1972—Continued

Standard metropolitan statistical area	Percentage of grocery store sales accounted for by—															Percentage of 1972 supermarket sales by top—	
	Top 4 grocery store companies					Top 8 grocery store companies					Top 20 grocery store companies						
	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	1954	1958	1963	1967	1972	4 firms	8 firms
Tyler, TX	40.0	47.5	61.3	57.4	67.0	56.9	64.5	73.3	71.5	75.4	73.6	78.6	83.5	84.7	84.6	94.8	100.0
Utica-Rome, NY	37.5	42.3	38.3	41.4	39.4	49.7	61.8	58.9	64.6	63.1	59.3	70.4	70.3	75.4	76.1	53.8	78.8
Vallejo-Fairfield-Napa, CA	n.a.	n.a.	36.9	41.6	49.4	n.a.	n.a.	51.5	56.3	65.3	n.a.	n.a.	73.6	78.5	85.5	[3] 61.0	81.8
Vineland-Millville-Bridge, NJ	n.a.	n.a.	n.a.	64.1	62.3	n.a.	n.a.	n.a.	75.6	([1])	n.a.	n.a.	n.a.	84.2	86.2	[3] 84.0	100.0
Waco, TX	42.4	50.4	48.8	48.3	61.6	54.8	59.6	59.8	60.2	68.3	67.0	69.9	70.9	72.8	76.2	[2] 95.0	100.0
Washington, DC-MD-VA	56.0	59.7	67.3	70.3	76.3	64.2	70.2	78.0	82.5	86.2	69.9	77.5	83.7	86.9	89.3	89.1	96.3
Waterbury, CT	39.0	39.9	46.0	50.6	46.8	52.9	54.9	59.2	65.2	70.1	63.1	71.0	73.0	77.1	81.6	([1])	94.4
Waterloo-Cedar Falls, IA	42.6	38.5	42.9	48.7	65.0	60.2	55.3	62.9	67.5	80.0	71.1	78.1	83.7	87.4	93.7	77.9	([1])
West Palm Beach-Boca Raton, FL	63.6	61.2	66.2	63.1	64.7	72.3	70.9	75.9	74.2	79.0	80.9	79.1	84.9	86.5	89.8	83.1	95.4
Wheeling, WV-OH	46.6	56.4	56.6	54.8	46.1	52.6	61.9	65.2	64.5	62.2	57.1	67.4	72.0	75.9	78.3	([1])	86.3
Wichita, KS	52.7	47.5	41.9	42.4	40.5	60.8	56.9	54.4	58.0	56.4	73.2	71.8	70.4	74.2	74.3	47.6	67.8
Wichita Falls, TX	52.2	52.8	57.5	55.4	65.8	60.1	65.1	68.9	70.6	77.1	72.0	80.0	81.1	82.4	([1])	94.6	100.0
Williamsport, PA	n.a.	n.a.	n.a.	n.a.	73.7	n.a.	n.a.	n.a.	n.a.	82.8	n.a.	n.a.	n.a.	n.a.	90.2	[4] 94.0	100.0
Wilmington, DE-NJ-MD	59.6	63.7	66.1	68.4	63.9	65.2	74.5	76.5	79.3	77.8	71.0	79.4	81.7	85.3	86.7	78.7	93.5
Wilmington, NC	n.a.	n.a.	n.a.	54.3	52.3	n.a.	n.a.	n.a.	68.8	70.0	n.a.	n.a.	n.a.	82.4	83.1	73.9	97.5
Worcester, MA	42.2	39.6	27.0	30.9	32.9	48.2	51.0	40.4	47.3	51.5	59.5	66.2	63.5	70.3	74.5	([1])	([1])
Yakima, WA	n.a.	n.a.	n.a.	n.a.	44.6	n.a.	n.a.	n.a.	n.a.	57.9	n.a.	n.a.	n.a.	n.a.	76.8	([1])	([1])
York, PA	36.1	45.8	44.3	47.1	44.4	40.3	54.0	55.9	62.0	61.2	47.0	61.2	65.6	71.7	76.3	([1])	82.3
Youngstown-Warren, OH	44.0	50.1	51.8	44.0	32.1	49.2	56.2	57.3	56.0	46.8	55.3	63.5	66.2	67.5	63.1	([1])	([1])
Simple-average [8]	45.5	49.3	50.1	51.1	52.4	54.4	59.9	62.0	64.8	67.3	64.5	71.0	74.3	77.7	80.7	69.6	

[1] Withheld to avoid disclosing figures for individual companies.
[2] The maximum and minimum values of the observation lie within ±1.5 percentage points of the indicated value and the extreme values round to no more than 1 percentage point difference from the number shown.
[3] The maximum and minimum values of the observation lie within ±2.5 percentage points of the indicated value and the extreme values round to no more than a 2 percentage point difference from the number shown.
[4] The maximum and minimum values of the observation lie within ±0.5 percentage points of the indicated value and the extreme values of the range both round to the indicated value.
[5] SMSA's created by the merger of 2 previously separate SMSA's.
[6] Redefinition resulted in a change of 10 to 20 percent in 1972 SMSA grocery store sales.
[7] Redefinition resulted in a change of more than 20 percent in 1972 SMSA grocery store sales.
[8] Averages for all years reflect SMSA's as defined at the time. Composition change between 1967 and 1972, due to the inclusion of new SMSA's and the combination of older SMSA's, is not significant. The simple average of 4-firm concentration ratios for 39 completely new SMSA's in 1972 was 52.8 percent. This is just slightly higher than the all SMSA average concentration ratio in 1972 of 52.4 percent. Considering, further, that the average for all new SMSA's includes 5 newly defined combinations of SMSA's which when reported on an uncombined basis in 1967 had a higher average concentration level than the 1972 average level of the combinations, composition change probably has less than 1/10 of a percent effect on the 1972 average concentration ratio compared to the average 1967 concentration ratio. The 4-firm supermarket concentration ratio average is adjusted for SMSA composition differences between the sample of SMSA's with supermarket concentration ratios and the universe of all SMSA's. This is done in order to make the average supermarket concentration ratio of 69.6 comparable to the average 1972 4-firm grocery store ratio of 52.4 percent.

n.a.—Not available.
*Denotes SMSA's which were combined in 1972 and for which 1954 through 1967 data are shown (below) for the previously defined SMSA components of the new definitions.

Note 1: In addition to new SMSA's, the U.S. Census has changed the definitions of many SMSA's over time. These changes generally reflect the growth in market areas. For example, of the 231 SMSA's defined in 1967, 88 (38 percent) were redefined for the 1972 Census by adding smaller geopolitical units to the 1967 SMSA definitions. In 5 instances units were dropped but usually others were added at the same time. In addition to the 88 changed definitions, 10 of the 231 SMSA's of 1967 were dropped and merged to form 5 new SMSA's in 1972. The effect of definitional changes varied considerably. In 52 SMSA's, redefinitions altered grocery store sales by less than 10 percent; in 21 SMSA's, grocery store sales were changed by 10 to 20 percent; and in 15 SMSA's, grocery store sales were altered by over 20 percent. SMSA's that were combined or epxerienced 1972 definitional changes affecting sales by over 10 percent are indentified with footnotes 5, 6, or 7.

Note 2: Supermarkets are defined as grocery stores with a million dollars or more in annual sales. In several instances where census disclosure rules prevented the reporting of precise concentration ratios, concentration ratio ranges were estimated by the authors and are reported. In such instances concentration ratios are expressed in whole numbers. Footnotes 2, 3, and 4 indicate the range within which the true value lies.

Source: These data are from a special tabulation prepared by the Bureau of the Census for the Bureau of Economics of the Federal Trade Commission and the Economics Research Service of the U.S. Department of Agriculture.