The Impact of Firm Conglomeration on Market Structure: Evidence for the U.S. Food Retailing Industry

by

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Introduction

Economists have analyzed the conduct and performance of conglomerate firms from several vantage points during recent years. In most studies, however, the examination of firm conglomeration has been subsidiary to investigating the relationship between dimensions of market structure and performance. Firm conglomeration or diversification frequently has been introduced in cross-sectional studies as an independent structural variable explaining measures of market performance such as profitability and technical progressiveness. Yet the linkage between conglomerate power and performance is not necessarily direct or immediate. Rather, the linkage may be more subtle as conglomerate firms use their unique power to restructure markets in the short or intermediate run, thereby influencing performance in the long run.

Examining the impact of conglomerate power on market structure in grocery retailing is particularly timely because market concentration is increasing in the industry and because current public policy initiatives toward the industry largely ignore the potential impact of conglomerate power on the industry's structure. In recent years there has been a persistent upward trend in concentration in standard metropolitan statistical

areas (SMSAs). Whereas in 1954 the top four chains held 60 percent or more of grocery store sales in less than one of every 20 SMSAs, by 1972 this level of concentration existed in over one-fourth of all SMSAs.[1] Moreover, the upward trend in concentration continued between 1972 and 1975.

Since the early 1960s there have been relatively few horizontal mergers, especially since the Supreme Court's decision in Vons, 384 U.S. 270 (1966), which dealt with a horizontal merger. The FTC challenged a number of market extension-type conglomerate mergers in the late 1950s and 1960s. In the only fully litigated case, National Tea, the Commission found the acquisition illegal but did not require divestiture because it believed that if future mergers were prevented concentration would be eroded over time.[2] Following the National Tea and Vons decisions the antitrust agencies have very nearly checked all significant horizontal mergers, but have permitted a number of significant market extension acquisitions by large grocery chains and acquisitions of grocery chains by large corporations outside food retailing.

These developments raise significant questions concerning the efficacy of various public policies designed to cope with them. Specifically, is there basis for the expectations expressed in the Commission's National Tea decision that concentration will erode if further mergers are prevented? Will the market concentration trend be halted if only significant horizontal mergers are prevented? Do market extension mergers by large chains or acquisitions of food retailers by large corporations outside grocery retailing effect concentration in the SMSAs in which the acquired firms operate? Does de novo entry by large chains erode market concentration?

In answering these questions we will build upon the method of Shepherd and others who examined factors influencing changes in concentration.[3] Our statistical models examine the change in four-firm SMSA (standard

metropolitan statistical area) concentration. We employ a cross-sectional sample of local retail food markets for reasons analagous to those given by Heggestad and Rhoades when investigating similar relationships among local banking markets.[4] First, an intra-industry sample of well-defined local markets is free from obfuscating inter-industry variations due to product heterogeneity. Secondly, as is not the case for many industries, the necessary market data -- concentration ratios, firm shares, records of mergers, entries, and exits -- are available for the local markets of this industry for the period studied.[5]

The following section develops hypotheses concerning the significance of firm conglomeration and describes the conglomerate structure of the food retailing industry. Thereafter we illustrate with two case studies the process of conglomerate-induced market restructuring. Section four presents a series of variables and formally specifies a multiple regression model to test our hypotheses. The final section presents and reviews estimation results.

Conglomerate Hypotheses and Descriptive Statistics

The unique characteristic of a conglomerate firm is that it operates across more than one product or geographic market. Such multimarket operations reduce the vulnerability of the conglomerate from the competitive forces of any one market because its livelihood derives from its business in all the markets in which it operates. Fritz Machlup believes that, "Even if the [conglomerate] concern, on the strength of its own share in the market in which it buys or sells, should have no great influence over prices and other items, it may acquire such influence as an adjunct of the power generated by sheer bigness.[6] Most important for our purposes is the conglomerate firm's capacity to restructure markets because it possesses greater power than some of its rivals. Edwards states the case eloquently:

> In encounters with small enterprises it can buy scarce materials and attractive sites, inventions, and facilities; preempt the services of the most expensive technicians and executives; and acquire reserves of materials for the future. It can absorb losses that would consume the entire capital of a smaller rival... moment by moment the big company can outbid, outspend, or out-lose the small one; and from a series of such momentary advantages it derives an advantage in attaining its large aggregate results.[7]

Any advantage accruing from sheer size is magnified if the conglomerate enjoys in some of its markets the power resulting from market dominance or oligopolistic market structures. The excess profits generated in oligopolistic markets can be employed to achieve market power in additional markets. Once conglomerates enjoy substantial power, says Edwin G. Nourse, there may be no natural market forces that contain further expansion: "There are no demonstrable or discernible limits at which such concentration of economic power, once fully underway, would automatically cease."[8]

Leading food chains possess the requisite characteristics of conglomerates: they are large in absolute terms and operate across many separate geographic markets. Table 1 shows for 10 leading chains the number of SMSAs in which they operated in 1966 and 1974. Not only did all but one chain operate in more than 10 SMSAs in 1966, but between 1966 and 1974 most increased substantially the number of SMSAs in which they operated. This increase was accomplished by both internal expansion (i.e., de novo entry by building new stores) and by market extension mergers. The numbers shown in Table 1 understate the multimarket character of these large chains because the table covers only 199 of the 263 SMSAs.[9] Moreover, about 25 percent of grocery stores sales are made outside of SMSAs.

Table 1 measures another dimension of potential conglomerate power, the extent to which large chains meet one another as actual and potential competitors. According to the conglomerate theory, when large conglomerate firms meet one another as actual and potential competitors in many markets, they tend to compete less aggressively with one another, lest aggressive behavior in one market trigger a retaliatory response in another.[10] Although we have not tested this hypothesis in the present study, there is evidence that multimarket contact points may lessen competition in food retailing as well as in other industries.[11] Moreover, in its National Tea decision the FTC found that, "As these leading chains pursue their parallel policies of geographic expansion, they inevitably meet each other in a number of cities. The result is frequently a market completely dominated by three or four [national] chains."[12] The Commission further found that when this occurred it effected the "quality" of competition, so that "hard" competition gave way to "soft" competition.[13]

Conglomerate power deriving from excess profits is enhanced when at least some of a chain's operations are located in highly concentrated markets and/or the chain enjoys a leading market position in some markets.[14]

A study of food retailing found the typical large chain enjoys these market characteristics in at least some markets. It therefore possesses some supra-competitive profits that enable it to engage in cross-subsidization strategies designed to enhance or maintain its market position in other markets.[15]

We hypothesize that the conglomerate characteristics of large chains provide a potential advantage over smaller rivals, so that as a group large chains tend to increase concentration or prevent its erosion. This is not to say that all large chains will always better their smaller rivals. Nor does conglomerate power always protect a large chain from loss of

Table 1. Competitive Interface between 10 Selected Large Food Chains in 199 SMSAs, 1966 and 1974

	SAFE-WAY	A & P	KROGER	WINN-DIXIE	LUCKY	JEWEL	GRAND UNION	SUPER** GENERAL	NATIONAL* TEA	STOP & SHOP	COMPET-ITIVE IN-TERFACE 1966+'74	PERCENT CHANGE 1966-74	SMSA's 1966	SMSA's 1974	NET CHANGE 1966-74	PERCENT CHANGE 1966-74
SAFEWAY		16	10	0	17	2	1	0	1	1	48	+14.3	57	62	+5	+8.5
		(18)	(6)	(0)	(12)	(2)	(1)	(0)	(2)	(1)	(42)					
A & P	16		60	37	9	17	24	16	24	21	224	+3.7	147	142	-5	-3.4
	(18)		(69)	(34)	(7)	(11)	(22)	(8)	(28)	(19)	(216)					
KROGER	10	60		17	4	6	0	0	9	0	106	-13.8	71	65	-6	-0.0
	(6)	(69)		(16)	(3)	(7)	(1)	(0)	(21)	(0)	(123)					
WINN-DIXIE	0	37	17		0	0	0	0	2	0	56	+7.7	34	38	+4	+11.9
	(0)	(34)	(16)		(0)	(0)	(0)	(0)	(2)	(0)	(52)					
LUCKY	17	9	4	0		4	1	0	7	0	42	+55.6	16	25	+9	+56.3
	(12)	(7)	(3)	(0)		(1)	(0)	(0)	(4)	(0)	(27)					
JEWEL	2	17	6	0	4		1	0	7	8	45	+50.0	13	20	+7	+53.8
	(2)	(11)	(7)	(0)	(1)		(1)	(0)	(3)	(5)	(30)					
GRAND UNION	1	24	0	0	1	1		8	5	13	53	+29.3	22	26	+4	+18.2
	(1)	(22)	(1)	(0)	(0)	(1)		(4)	(5)	(7)	(41)					
SUPER GENERAL	0	16	0	0	0	0	8		0	10	34	+183.3	8	16	+8	+100.0
	(0)	(8)	(0)	(0)	(0)	(0)	(4)		(0)	(0)	(12)					
NATIONAL TEA	1	24	9	2	7	7	5	0		0	55	-15.4	33	28	-5	-15.2
	(2)	(28)	(21)	(2)	(4)	(3)	(5)	(0)		(0)	(65)					
STOP & SHOP	1	21	0	0	0	8	13	10	0		53	+65.6	19	23	+4	+21.1
	(1)	(19)	(0)	(0)	(0)	(5)	(7)	(0)	(0)		(32)					

*National Tea includes Loblaw stores in 1966 and 1974.

**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.

market share, as the history of A&P vividly demonstrates. However, even A&P has been the beneficiary of its conglomerate power. Although it is generally acknowledged to have performed poorly in recent years as it failed to adjust to the changing market environment, nonetheless A&P used the resources from its profitable markets to subsidize its survival in markets where it has been unprofitable for years. Certainly, had each of A&P's divisions been forced to survive on its own, as do single-market retailers, many A&P divisions long ago would have been forced to withdraw from their markets. Thus A&P stands as a monument of a conglomerate with many inefficient operations surviving because of conglomerate power. Although A&P is the most notable example, some other large chains also have not been able to maintain their position in many markets, e.g., National Tea after it was stopped from growing by merger in the 1960s. These are exceptions, however, to the general rule that large chains continue to expand despite temporary adversities.[16]

Before turning to case study evidence that large chains not only possess conglomerate power but use it to restructure markets, we shall sketch the process by which such restructuring occurs when large chains enter new markets de novo or by acquisition.

The effect on concentration of mergers between direct competitors (horizontal mergers) is quite obvious. If one of the firms involved is a leading firm in the market, four-firm concentration will increase immediately. But the impact is less obvious when grocery retailers in different geographic markets merge or when a large firm not involved in food retailing acquires a grocery retailer. Both types of mergers may be characterized as conglomerate mergers, since the acquired firm operates in a different market than the acquiring firm. There is no immediate impact on the

acquired firm's market share since the merger merely involves a change in ownership. The long-run result may be either to decrease, increase, or have no effect on concentration.

There is a body of literature that reasons that when the acquired firm holds a relatively modest market position, its acquisition (a so-called toehold acquisition) by a powerful conglomerate will erode concentration. This theory assumes that the new conglomerate entrant will strengthen the acquired firm's ability to compete with the leaders, resulting in an erosion of the latter's market share.[17] According to this theory, such mergers may have the same salutary effect believed to result when large firms enter a market de novo, i.e., by building new facilities. But the assumed deconcentrating impact of conglomerate toehold acquisitions or de novo entry requires very special assumptions, especially concerning the character of the entering firm and the character of the firms already in the market. If the acquiring firm is a conglomerate possessing the power discussed above, its entry carries with it the potential for industrial restructuring.

Twenty years ago John M. Blair emphasized the crucial importance of distinguishing between the types of market structures in which conglomerate mergers occur.[18] When a large conglomerate firm enters by merger a highly concentrated industry composed entirely of other equally powerful conglomerates, it is not possible to predict whether the conglomerate's entry will promote or retard competition. If it engages in cross-subsidization, its rivals will be able to match dollar-for-dollar its price-reducing or cost-enhancing strategies. Then, the outcome is indeterminate because one conglomerate has merely replaced another. But when a conglomerate enters a highly concentrated market by de novo entry, it is reasonable to expect an erosion in the position of the leading firms.

But even de novo entry may have anticompetitive consequences when a powerful conglomerate enters an industry (or market) composed of "single-line" (or "single market") firms. As Blair put it, "The danger to competition posed by cross-subsidization, whether actual or anticipated, is at a maximum in unconcentrated industries populated largely by single-line firms."[19] He added, however, that "cross-subsidization may appear as a danger to single-line producers in oligopolistic as well as unconcentrated industries..."[20] The key here is that, "What had been a 'symmetrical' oligopoly, with each of the oligopolists having about the same position, might be transformed into an 'assymetrical' oligopoly, with the new entrant assuming a position of dominance and leadership."[21]

Conglomerate entry into new markets thus may adversely affect competition even when it does not involve acquiring an industry leader. The more relevant consideration is the nature of the firms in the acquired firm's market, i.e., whether or not they too are conglomerates or are firms depending exclusively or largely on a single market for their livelihood.

Existing grocery retail markets consist of a mix of large conglomerate, regional, and essentially local retailers. When a conglomerate enters such markets it has both the capacity and incentive to expand its position by engaging in cross-subsidization. But as its market share grows, the market leaders will not stand idly by and forsake their positions to the conglomerate entrant. Large conglomerates as well as the strongest local chains already in the market are likely to respond to preserve their positions.

In the escalating price and nonprice rivalry triggered by the entering conglomerate's strategies, the largest firms likely will fare better than the smaller firms caught in the struggle. Financial institutions cannot be expected to lend funds to smaller retailers to support advertising and other

costly strategies essential to success during periods of structural turmoil caused by conglomerate entry. On the other hand, large food chains can support a variety of costly advertising, pricing, and other competitive tactics tailored to each community in which the firm does business.

The resulting competitive advantages of the large chain should not be misconstrued as economies of scale. They do not derive from its scale of operations in a target market, but from its broad reach across many markets, including a presence in some markets where it reaps the rewards of oligopoly and individual firm dominance. The large conglomerate invests in market restructuring strategies when it believes doing so will ultimately pay off in larger market shares and profits.

Two Case Studies

Case study evidence supports the above characterization of the likely result of large chain entry, even when such entry is not entirely successful. A Federal Trade Commission study documents the effects of the National Tea's entry into the Detroit, Michigan, market in 1952.[22] It entered by acquiring the C.F. Smith Co., which had only about 2.0 percent of sales in Detroit. Between 1953 and 1959 National Tea engaged in massive promotional outlays, doubling as a percent of sales the expenditures on advertising and trading stamps. Whereas its newspaper advertising initially was greater than that of two of the market leaders, all leading chains responded by expanding their own promotional outlays so that by 1959 all but one of the top four were spending more than National Tea. The share of grocery store advertising done by all retailers other than the top five (National Tea was fifth) fell from 32 percent in 1955 to 5 percent in 1959.

The costs of National Tea's subsidized expansion in Detroit were substantial both to itself and smaller retailers. It incurred losses reaching $2.4 million and $1.5 million, respectively, during 1958 and 1959, or an average of 2.9 percent of sales. (No information is available after 1959.) Although its total sales increased, National's market share in Detroit rose modestly -- from 2.8 percent in 1954 to 3.9 percent in 1958. On the other hand, the top four chains' share grew from 38.5 percent in 1954 to 49.9 percent in 1958, and to 52.1 percent in 1963. This was a much greater increase than occurred in other large cities over the period.

Thus, while National's subsidized expansion did not give it a large market share by 1958, its entry triggered a response by the leading established firms unwilling to give up market share. Although the leading firms also likely earned subnormal profit during the period, the hardest hit were the smaller, single-market retailers that could not respond in kind. As a result, between 1954 and 1963 the market share held by retailers other than the top five fell from 59 percent to 44 percent, or about one-fourth in just nine years.

National's subsidized expansion was disrupted by an antitrust case in 1959 challenging the C.F. Smith and all other mergers made by National during the 1950s. This may well have caused National to abort its plans for further subsidized expansion since the practice was a central theory of the FTC case.[23] In any event, National ultimately sold its Detroit operation. There is no way of knowing whether the outcome would have been different if National's mergers had not been challenged by the FTC. But the Detroit and other instances where National subsidized its expansion illustrate the capacity and willingness of large chains to pursue cross-subsidization policies to increase their share in a market.

A recent example of the consequences of conglomerate chains' de novo entry is Safeway and Lucky Store's entry into the Houston market in 1970. At the time the leading chains and their respective shares were: Weingarten, 22 percent; Kroger, 9 percent; and Rice Foods, 9 percent.[24] Weingarten is a regional chain and Rice a local chain. During the mid-1970s retailers in Houston became locked in an intensive competitive struggle. As in Detroit, the intensified competition often assumed non-price forms. In 1976, Supermarket News reported, "Competition here currently 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 this year."[25] Safeway, Kroger and Lucky's aggressive expansion, especially Safeway's, cut into Weingarten and Rice's market shares and profits.[26] Supermarket News quoted a "knowledgeable source" as observing: "Safeway doesn't just want to move in and share a market: it wants to take over."[27]

"By 1977, Safeway and Kroger [had] increased their market shares [each with 14 percent], primarily at the expense of J. Weingarten, Inc., the largest locally based chain, which is struggling to hold its razor-thin and ever diminishing lead [18 percent share]."[28] One local chain, Lewis and Coke Super Markets, recently filed for bankruptcy and Rice Food Markets and Handy Andy "appear to be retrenching, as victims of competition. Smaller independents, though retaining influence in their own neighborhoods, also are fighting off the dominance of larger chains."[29]

Among Safeway's recent strategies has been an increase in store hours, which "has forced many operators into a 12- or 14-hour day, 7 days a week schedule."[30] This results in increased operating costs. Additionally, costs in the Houston market have escalated because "food operators as a group are spending more on newspaper advertising."[31] The overall pattern in Houston appears to be one of declining shares for the leading regional and local chains in Houston as they yield ground before the large multi-market chains.

The preceding illustrate that large grocery chains are conglomerate corporations with the capacity and incentive to increase individually their market shares, and that given the structure of grocery retail markets such individual pursuit of greater market shares tends to increase the share held by the leading chains. Given this setting, we expect that large chains will tend to increase concentration in markets where they already operate as well as in markets that they enter either de novo or by merger. We now turn to a statistical test of these hypotheses.

Model Specification

Dependent Variable

Change in Four-Firm Concentration (CHCR) and (PCHCR): The change between 1967 and 1975 in four-firm concentration in an SMSA can be measured by the absolute percentage point change (CHCR) and the percentage of change (PCHCR). These are alternative measures of changes in local concentration, one measuring absolute and the other proportional change. The changes in four-firm concentration (CR_4) were examined for the years between 1967 and 1975 because complete merger data were available for this period and because we wished to examine a relatively recent lengthy period to capture long-run effects rather than short-run variations about trend.[32]

Independent Variables

Horizontal Mergers (HM and PHM): HM measures the market share held in the year of acquisition by grocery retailers acquired during 1968-1975 by the top four firms in an SMSA. PHM is the same as HM except that it is expressed as a percentage of CR_4 in 1967. Since the identity of the top four firms can change over the period, the definition of HM must be more

specific. Choosing the top firms from the beginning or end of the period is not an appropriate measure of horizontal merger activity in light of the model's purpose. The model predicts changes in four-firm concentration and not the rise or decline of a particular set of firms. Therefore, HM was constructed using the acquisitions by the top four firms in the year prior to each acquisition.[33] Also, when mergers between firms below the top four created a combined firm larger than the fourth largest firm, HM is equal to the net percentage point increase in CR_4 caused by the merger.

When one of the four leading firms in a market that are currently the market leaders acquires a smaller firm, the immediate effect is to increase CR_4 by the share held by the acquired firm. Although the longer term effect on CR_4 could be either greater or less than the immediate effect, HM and PHM are predicted to have positive impacts on $CHCR_4$, but we are unable to predict whether the coefficient is more or less than 1.

Number of Large Food Chains in SMSA in 1967 (NFC): The number of large food chains in an SMSA in 1967 is a basic indicator of the market's conglomerate structure. Defining which firms are conglomerates is necessarily somewhat arbitrary because there is no precise threshold at which a firm attains sufficient conglomerate power to engage in substantial industrial restructuring strategies. All chains, except A&P, were included in NFC if their sales exceeded $500 million in 1972. Because of its unique nature as discussed above, A&P is separated from other large chains and is introduced as a separate variable in the model. The $500 million cut-off was adopted because such chains were multimarket firms in 1967 with substantial potential to engage in cross-subsidization.[34] Twenty-two supermarket chains qualified as conglomerate food retailers by this definition. NFC is included in the analysis to test the hypothesis that the large absolute size and multi-market operations of such chains confer special power on them. Such

conglomerate-derived power permits chains to engage in competitive strategies not available to smaller food retailers. They are better able to rebuff entry, outspend and outlast smaller rivals in price and nonprice wars, and generally pursue market share maintaining and enhancing strategies not open to nonconglomerate firms.

As discussed earlier, this hypothesis does not require that every large chain continually increase its market position, but rather that there exists a general tendency for conglomerate chains as a group to increase their combined market share. We therefore predict that the greater the number of large chains occupying an SMSA in 1967 the greater the increase in market concentration between 1967 and 1975.

Large Food Chain Entry De Novo (EDN, EDN-72, EDN-74): Three measures are used to test hypotheses regarding the effects of de novo entry by large food chains: EDN indicates the number of chains that entered an SMSA between 1967 and 1974; EDN-72 indicates the number that entered between 1967 and 1972; and EDN-74 indicates the number that entered in 1973 and 1974. The sample contains 53 instances of entry into 38 SMSAs between 1967 and 1974. As explained, EDN is hypothesized to be positively related to change in concentration. When EDN-72 and EDN-74 are specified instead of EDN we expect both to be positively related to change in concentration; however, EDN-72 should have more impact than EDN-74.

Conglomerate Entry by Merger (CEM): This variable measures the number of large food chains and large nonfood retailers that entered an SMSA during the 1968-1972 period by merger.[35] Large food chains are defined as having sales exceeding $500 million in 1972[36] and large nonfood retailers are defined as firms with assets of $100 million or more.[37] The reason for combining these two types of conglomerate mergers is that there are only ten mergers in nine SMSAs by nonfood retailers. The combined variable, CEM,

has 31 instances of entry by merger in 23 SMSAs;[38] therefore it is less susceptible to the influence of a single acquisition. Conglomerate entry by merger is not split between pre- and post-1972 periods because all these mergers occurred prior to 1972. As in the case of entry de novo, CEM is hypothesized to have a positive impact on change in concentration.

Large Food Chain Exit (FEX): FEX indicates the number of large food chains that exited from an SMSA between 1967 and 1974. Because the FTC and Department of Justice merger guidelines generally restrict the sale of stores by exiting chains to large competing chains, exit by large chains tend to strengthen the position of smaller retailers.[39] Exit also diminishes the conglomerate presence in the markets. However, exit may be an indication of a firm's failure to keep pace with the advancing market shares of other conglomerates, and therefore may not be associated with decreasing concentration. Because these conflicting potential effects no direction is hypothesized for the relationship between FEX and change in concentration.

Market Share of A&P in 1967 (SAP): A&P has had a poor profit performance record for over a decade and has steadily lost market share. Although the company possesses conglomerate-derived power which has enabled some unprofitable divisions to survive, this power has not been sufficient to offset totally the poor management of A&P. Whereas the avowed purpose of its 1972 WEO program was to check the erosion of the company's profits and market position, it failed to do so. In 1967 A&P was a member of the top four firms in most of the markets in which it operated. Because of its exceptionally poor performance during the period examined, we hypothesize that the larger A&P's presence in an SMSA in 1967 (as measured by its market share), the greater the likelihood that CR_4 decreased between 1967 and 1975.

Four Firm Concentration Ratio in 1967 (ICR_4): This variable measures the initial level of concentration (CR_4 in 1967) for the period examined, 1967-1975. Previous empirical studies have tested the hypothesis that change in concentration is negatively related to initial concentration.[40] Stigler's rationale is that leading firms in concentrated industries may choose to maximize long-run profits by raising prices to levels that will not forestall all entry. This behavior permits the expansion of fringe firms and enhances the attractiveness of entry, thus eroding concentration.[41]

Another hypothesis explains this relationship in food retailing in terms of economies of scale. The existence of scale economies (real and pecuniary) in advertising create declining long-run average costs at the market level for multistore firms. If these advantages are substantial, we would expect them to exert influence in markets when few firms were of a size that enabled them to enjoy most of these scale advantages. Other things being the same, the impact on concentration would be greatest in the least concentrated markets, because here fewer firms than in concentrated markets would be of minimum optimum size. Thus we expect this factor to cause greater increases in concentration in less concentrated markets than in highly concentrated ones, thereby resulting in a negative relationship between ICR_4 and $CHCR_4$.

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. When market demand is growing slowly, the "displacement problem" faced by new entrants and small firms is an important deterrent in their growth in market share. Contrarywise, when market demand is growing rapidly new and established small firms face a less difficult displacement problem because less of their growth

need be at the expense of leading firms. This leads to the expectation that entering and fringe firms make a disproportionately large share of the expanding sales in rapidly growing markets, with the result that CR_4 declines. MG is therefore hypothesized to be negatively related to changes in CR_4.

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 introduced as a control variable. It is not clear how MS might influence changes in CR_4 in grocery retailing. Because consumers in inner cities have less mobility than in other areas, and for other reasons, small stores often thrive despite their higher costs. This would suggest a negative relationship between MS and changes in CR_4.

Empirical Results

The basic model to predict the absolute change in four-firm concentration between 1967 and 1975 is summarized in the following equation. The hypothesized signs for the coefficients are indicated below the equation. When predicting percent change (PCHCR) we use the same specification except PHM is substituted for HM.

$$(5.1)\quad CHCR = \beta_0 + \beta_1\, HM + \beta_2\, NFC + \beta_3\, EDN + \beta_4\, CEM + \beta_5\, SAP +$$
$$\beta_1 > 0 \quad \beta_2 > 0 \quad \beta_3 > 0 \quad \beta_4 > 0 \quad \beta_5 < 0$$
$$\beta_6\, FEX + \beta_7\, ICR_4 + \beta_8\, MG + \beta_9\, MS$$
$$\beta_6 \lessgtr 0 \quad \beta_7 < 0 \quad \beta_8 < 0 \quad \beta_9 < 0$$

The above model was tested by multiple regression analysis of the absolute and percent change in four-firm SMSA concentration in 86 SMSAs between 1967 and 1975.[42] Table 2 displays the gereralized least squares coefficient estimates and statistics for several different models.[43] Each of the

equations reported is statistically significant at the 1 percent level based upon an F test. Equation 1a is the simplest model.

Horizontal mergers (HM) has the hypothesized positive sign and is significant at the 1 percent level. Importantly, the coefficient is greater than one, which means that the impact on concentration was greater than the share of the market acquired. If one of the top four firms acquire 1 percent of the market, CR_4 increased about 1.5 percent by 1975.

The number of large food chains (NFC) operating in an SMSA in 1967 also has the hypothesized positive sign and is statistically significant at the 1 percent level. This means that the larger the number of large food chains operating in a market in 1967, the greater the increase in CR_4 between 1967 and 1975.

Both large chain entry de novo (EDN) and conglomerate entry by merger (CEM) have the predicted positive signs and are statistically significant at the 1 percent level. This indicates that concentration increased when large chains entered these markets de novo or by merger and when large outside corporations entered by merger.

Initial concentration (ICR_4) has the predicted sign but is only marginally significant. Market growth (MG) is not statistically significant at the 5 percent level. Market size is negative and significant at the 1 percent level.

Equation 1b contains the same explanatory variables as Equation 1a except that the market share of A&P in 1967 (SAP) is introduced. It has the hypothesized negative sign and is significant at the 5 percent level. If A&P had a 10 percent market share in 1967, $CHCR_4$ was 2.53 percentage points lower than if A&P were not in the market. Whereas the presence of other large food chains (NFC) had a positive impact on $CHCR_4$, A&P's presence had an opposite effect. Clearly A&P's behavior during the recent

TABLE 2 MULTIPLE REGRESSION EQUATION PREDICTING THE CHANGE IN 4-FIRM CONCENTRATION BETWEEN 1967 AND 1975 IN 88 SMSA's [a/]

	Dependent Variable	INDEPENDENT VARIABLES															
		Intercept	Horizontal Mergers (HM)	Percent Horizontal Mergers (PHM)	Number of Large Food Chains (NFC)	Large Food Chain Entry De Novo 1967-1974 (EDN)	Large Food Chain Entry De Novo 1967-1972 (EDN 72)	Large Food Chain Entry De Novo 1973-1974 (EDN 74)	Large Food Chain Exit (FEX)	Conglomerate Merger (CEM)	Market Share of A&P in 1967 (SAP)	4-Firm Concentration Ratio (CR_4)	Market Growth 1967-1972 (MG)	Market Size (MS)	R^2	F Ratio
Absolute Change																	
1a.	$CHCR_4$		1.470**		2.381**	2.751**				3.344**		-.128*	-.028	2.469*	.561	27.454**
	Percent	2.368	(2.476)		(3.103)	(2.750)				(3.456)		(1.456)	(.518)	(2.122)		
1b.	$CHCR_4$		1.369*		2.165**	2.189*				3.044**	.253*	.030	-.054	-2.755*	.578	11.728**
	Percent	4.097	(2.322)		(2.829)	(2.125)				(3.128)	(1.855)	(.034)	(.977)	(-.648)		
1c.	$CHCR_4$		1.395*		1.883*	2.224*			1.737	2.845**	-.232*	-.051	.045	2.015*	.569	10.031**
	Percent	1.891	(2.026)		(2.335)	(2.151)			(1.225)	(2.670)	(1.713)	(.558)	(.817)	(1.574)		
1d.	$CHCR_4$		1.334*		1.838*		2.483*	356	1.563	2.981**	-.251*	-.029 [d]	-.044	-1.909*	.55*	8.617**
	Percent	1.256	(2.145)		(2.238)		(2.274)	(-.362)	(1.367)	(2.640)	(1.954)	(.992)	(.788)	(1.375)		
Relative Change																	
2a.	$PCHCR_4$			1.437**	4.655**	7.702**				6.203**		-.503**	-.078	-4.738*	.633	16.820**
	Percent	17.424		(2.753)	(2.824)	(3.530)				(3.520)		(2.546)	(.643)	(-2.050)		
2b.	$PCHCR_4$			1.370**	4.349**	6.640**				5.197**	-.511*	-.409*	-.129	-4.108*	.712	21.123**
	Percent	19.435		(2.637)	(2.527)	(2.969)				(3.025)	(1.666)	(2.005)	(1.048)	(-1.826)		
2c.	$PCHCR_4$			1.442**	4.045*	6.466**			2.513	5.367**	-.484*	-.314*	.114	-3.933*	.623	12.545**
	Percent	14.391		(2.706)	(2.364)	(2.865)			(1.784)	(2.514)	(1.583)	(1.539)	(.925)	(1.592)		
2d.	$PCHCR_4$			1.403**	4.091*		7.042**	2.611	1.809	5.909**	-.521*	-.281*	-.106	-3.999*	.617	12.480**
	Percent	13.385		(2.583)	(2.310)		(2.968)	(.412)	(1.047)	(2.595)	(1.707)	(1.377)	(.856)	(1.509)		

a/ 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 function form: $\sigma^2 = \beta_0 + \beta_1 \cdot LNMS$ is the natural logarithm of market size. Representative sizes for β_0 and β_1 in equation 1a to 1d are 22 and 13. In equation 2a to 2d they are 1112 and 68.

** Significance of levels equals 1 percent

* Significance of levels equals 5 percent

* Significance of levels equals 10 percent

NOTE: 2-tail test for significance were used on EDN and FEX, 1-tail tests were used for 11 other independent variables

past differed significantly from that of other large food chains. The inclusion of SAP in the model generally reduces the t-value for other variables and eliminates ICR_4 as a significant variable.

Large food chain exit (FEX), which is introduced in Equation 1c, has a positive sign, but is not statistically significant. Thus, during the period examined, exit by large food chains conferred no measurable competitive advantage to either leading or fringe firms.

Equation 1d tests the dynamics that are associated with entry de novo by substituting EDN-72 and EDN-74 for EDN. As hypothesized, pre-1973 entry (EDN-72) has a larger positive impact on $CHCR_4$ and is statistically significant at the 1 percent level. Post-1972 entry (EDN-74) has a positive sign but is not statistically significant. Since all cases of conglomerate entry by merger (CEM) occurred between 1957 and 1972, the coefficient on CEM is comparable to that on EDN-72. The concentrating effect of entry de novo is slightly less than entry by merger (2.3 points versus 2.6 points), but the difference is not significant.

Equations 2a-2d are identical to Equations 1a-1d except that the dependent variable, change in CR_4, is expressed as a percentage change rather than as a change in percentage points. The results are generally the same as earlier models, although they are statistically somewhat more robust. The only variables to change in significance are SAP, which is significant at the 10 percent level rather than 5 percent, and ICR_4, which is consistently significant in the latter three models.

The most important findings of the analysis are the consistently significant effects of NFC, EDN, and CEM. The findings provide strong confirmation of the hypothesis that large conglomerate firms not only possess the power to restructure markets but that during the period examined they succeeded in doing so. The finding that acquisitions (many of which might

be classed as toehold acquisitions) by conglomerates increase concentration may surprise many, but they are consistent with Dr. Stephen Rhoades' finding in banking.[44] Perhaps more surprising to many is the finding that even de novo entry by large chains tends to increase CR_4 in SMSAs. This finding must be interpreted cautiously, however, since it may not adequately test the hypothesis that de novo entry will erode concentration in highly concentrated markets. The sample contains relatively few instances of de novo entry into highly concentrated markets. Indeed, the de novo entry markets had an average four-firm concentration of only 42.8 percent in 1967, which is significantly below the average four-firm concentration of 51.1 percent of all SMSAs. Only 4 of 53 instances of de novo entry were in markets with four-firm concentration above 60 percent. In sum, our findings support the hypothesis that de novo entry by large chains in low-to-moderately concentrated markets tends to increase concentration, but leaves unanswered the question of their impact on highly concentrated markets.

The findings of this study are disturbing. They strongly suggest that the growing presence of large chains in markets tends to increase market concentration, thereby supporting the gloomy prognosis of E.G. Nourse that, "There are no demonstrable or discernable limits at which [conglomerate-induced] concentration of economic power, once fully underway, would automatically cease."[45] We do not believe this gloomy prediction is inevitable in grocery retailing. Options do exist to prevent all markets from becoming highly concentrated. This will require vigorous and innovative enforcement of existing antitrust laws as well as complementary programs to stimulate more effective competition.[46]

Footnotes

[1]B. Marion, W. Mueller, R. Cotterill, F. Geithman, J. Schmelzer, The Profit and Price Performance of Leading Food Chains, Joint Economic Committee Print, April 12, 1977, p. 18. Concentration of grocery sales on a nationwide basis has also increased. The 20 leading firms' share of grocery sales increased from 26.9 percent in 1958 to 37.0 percent in 1975, ibid, p. 11. Large food chains have come to be the leading food chains in most local SMSA markets.

[2]National Tea, FTC Docket No. 7453 (1966).

[3]W. Shepherd, "Trends in Concentration in American Manufacturing Industries, 1947-1958," Rev. of Econ. and Stat., May 1964, pp. 200-212, and W. Mueller and L. Hamm, "Trends in Industrial Concentration: 1947-1970," Rev. of Econ. and Stat., November 1974, pp. 511-520. W. Mueller and R. Rogers, "Role of Advertising in Changing Market Structure," Rev. of Econ. and Stat. (forthcoming).

[4]A. Heggestad and S. Rhoades, "Multi-Market Interdependence and Local Market Competition," Rev. of Econ. and Stat. (forthcoming, 1978), and S. Rhoades, "The Impact of Foothold Acquisitions on Bank Market Structure," The Antitrust Bulletin Spring, 1977, pp. 119-129.

[5]The Federal Trade Commission supplied its pre-merger notification Reports for food retailing to the Joint Economic Committee. These Reports included food store mergers by all chains with sales exceeding $100 million. Smaller acquisitions were obtained from secondary sources. The authors were members of a research group requested by the JEC to analyze these and other data. Preliminary results of the analysis reported here appeared in Marion et. al., op. cit., pp. 122-23, which involved a comprehensive study of the price and profit of large food chains.

[6]F. Machlup, The Political Economy of Monopoly (1952) p. 112.

[7]C. Edwards, "Conglomerate Bigness as a Source of Power" in Stigler (ed.), Business, Concentration, and Price Policy (1955) pp. 334-35.

[8]E. Nourse, "Government Discipline of Private Economic Power," in Administered Prices: A Compendium on Public Policy, Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, U.S. Senate, Committee Print, 1963, p. 255.

[9]The Bureau of the Census tabulates information for "standard metropolitan statistical areas." These SMSAs typically include at least one county (or other political subdivisions of states) and often several. They frequently encompass cities that are not within the same economic market, i.e., the firms in one city in an SMSA do not compete directly with firms located in other cities within an SMSA. These SMSAs were not included in this sample.

[10]Corwin Edwards first identified this problem, op. cit.

[11]See Federal Trade Commission, Report on Corporate Mergers (1969), pp. 458-470. An empirical study by Heggestad and Rhoades found a similar relationship in banking, "Multimarket Interdependence and Local Market Competition," op. cit.

[12]FTC, National Tea, Docket No. 7453, Final Decision & Order, 1966, p. 7.

[13]Ibid., p. 13.

[14]Marion, et. al., op. cit., found that these two structural characteristics -- market concentration and market share -- are important determinants of the profitability of large grocery chains.

[15] Ibid.

[16] There are frequent trade references to the advantages associated with multimarket operations. For example, the president of a leading regional chain (Pic-n-Pay with sales of $383 million) recently gave as a reason for his company's merger with a larger chain (First National Stores with 1977 sales of $966 million) his experience during an intensive price war, which "taught us that we were very vulnerable to have all our stores in one area" Wall Street Journal, August 22, 1978, p. 31.

[17] See J. Campbell and W. Shepherd, "Leading Firm Mergers," The Anti-Trust Bulletin, Winter, 1968, pp. 1361-1332, for an extended discussion of this theory.

[18] J. Blair, "The Conglomerate Merger in Economics and Law," Georgetown Law Journal, Summer, 1958.

[19] J. Blair, Economic Concentration (1972) p. 51.

[20] Ibid., p. 53.

[21] J. Blair, "The Conglomerate Merger in Economics and Law," The Georgetown Law Journal, Summer, 1958.

[22] The following is from National Commission on Food Retailing, Food Retailing (1966), pp. 377-383.

[23] See F.T.C., In the Matter of National Tea, Docket No. 7453, 1959. The Commission decision in this matter found National's merger violated Section 7. Opinion of the Commission, March 4, 1966. The Commission's final order prohibited National from making acquisitions for 10 years.

[24] Metro Market Studies, Metro Market Grocery Guide: 1971 (1971).

[25]"Texas Retailers Scramble for $1.5 Billion Market," Supermarket News, August 16, 1976, p. 28.

[26]"Independents Share Slips in Chain-Dominated City," Supermarket News, August 16, 1977, p. 69.

[27]Ibid.

[28]"Market Profiles 1978," Supermarket News, August 14, 1978, p. 40.

[29]Ibid.

[30]Ibid.

[31]Ibid.

[32]Bureau of Census estimates of 1967 CR_4 and a projection of 1972 census CR_4 to 1975 were employed to construct the dependent variable. The projection, based upon Metro Market Studies data, is 1972 census CR_4 multiplied by the ratio of 1975 metro CR_4 to 1973 metro CR_4 (1973 metro covers calendar year 1972). This procedure uses metro market data to estimate changes in concentration between 1972 and 1975, thereby minimizing our reliance upon the less reliable metro market data series.

[33]Annual market share estimates from Metro Market Studies, Grocery Guide were used to identify the rank of grocery firms.

[34]Grocery Guide, op. cit., was used to identify the presence of large food chains in a market. It also was used to identify their entry and exit from a market. An alternative cut-off point of $500 in 1967 produced a conglomerate variable encompassing 17 large food chains. Regression results were nearly identical, suggesting that the cut-off point has little impact on this measure's properties. That sample, however, was

34 (continued)
larger and less reliable than the current sample. See R. Cotterill, Market Structure, Performance, and Market Restructuring in the Food Retailing Industry, (Unpublished Ph.D. Dissertation, University of Wisconsin, Madison, 1977), for further information.

35 CEM was constructed from data furnished by the Federal Trade Commission (footnote 5, supra) and supplemented by information from such public sources as trade publications and Moodys Industrials.

36 Allied Stores' entries involving stores located in K-Mart stores were not counted as de novo entry because they involved predictably limited entry, and therefore did not trigger the same kind of retaliatory responses to entry as entry on an actual or potentially larger scale.

37 Large food chains' sales-to-asset ratios are usually five or more to one, hence the $100 million cutoff. Brown and Willimson's acquisition of Kohl's in 1972 is an example of nonfood conglomerate entry by merger. Kohl's is a regional chain located primarily in Wisconsin and had sales of $205 million in 1972. In the same year that it was acquired, Kohl's embarked on an expensive and sophisticated advertising program that is strikingly similar to the glossy magazine advertisements of cigarette corporations. See Supermarket News, "Kohl's Ad Philosophy Leads to Wisconsin Success," August 2, 1976, p. 8 for further information.

38 An analysis based on a larger, but less reliable sample introduced each type of acquirer as a separate independent variable. This analysis found each type of acquirer to be statistically significant at the 1 percent level. See Cotterill, supra., 34, for further information.

39 There have been notable exceptions where the antitrust agencies have permitted large existing chains to sell their stores to other large chains within the SMSA.

[40]See Shepherd, and Mueller and Hamm, supra.

[41]G. Stigler, The Theory of Price (1952), p. 252.

[42]All SMSAs for which data are available from the Bureau of Census and Metro Market Studies were considered for inclusion in the sample. Several SMSAs, however, were deleted because the 1967 and 1975 geographical definitions of the metropolitan area were not congruent. Fourteen additional markets were deleted because metro estimates of 1972 CR_4 differed from Census CR_4 by more than 20 percent. This produces a sample of 86 SMSAs that accounted for approximately 40 percent of grocery stores sales in 1972. The largest SMSA included in the sample was Chicago with $2.99 billion sales in 1972, the smallest was Columbus, Georgia, with $76 million sales in 1972. For test results based on a larger sample of 110 SMSAs see Cotterill, Market Structure, Performance, and Market Restructuring in the Food Retailing Industry, op. cit., p. 120. They reflect very closely the results reported here.

[43]Preliminary estimation efforts indicated the presence of heteroskedasticity: the variance of the regression residuals increased as market size decreased. An intuitive explanation for this phenomenon is that an external shock of a given absolute magnitude will produce a larger variation in concentration in smaller cities than in large ones. If, for example, the sales of the top four firms decline by $3 million because a fire destroys a store, the CR_4 declines 3 percent in a market with $100 million sales but only .3 percent in a market with $1 billion in sales.

[44]Rhoades, "The Impact of Foothold Acquisitions on Bank Market Structure," op. cit. Rhoades, senior economist, Federal Reserve Board, tested the hypothesis that "foothold" acquisitions tended to reduce concentration. Using multiple regression analysis, Rhoades examined various factors

44 (continued)
influencing changes in concentration in commercial banking in 112 metropolitan areas between 1966 and 1973. Although Rhoades interpreted his results as not supporting the foothold theory, his statistical findings not only failed to support the foothold theory but actually supported the contrary theory that foothold acquisitions by bank holding companies increase concentration.

45 E. Nourse, op. cit., p. 255.

46 Prices and Profits of Leading Retail Food Chains, 1970-74, Hearings before the Joint Economic Committee of the United States Congress, 95th Congress, 1st Session, March 30 and April 5, 1977, pp. 19-28; R. Cotterill, "Declining Competition in Food Retailing: An Opportunity for Consumer Food Cooperatives?" Journal of Consumer Affairs, Vol. 12, No. 2, Winter 1978, pp. 250-265.