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To the Graduate Council:

I am submitting herewith a thesis written by Dwight E. Phillips entitled "An Analysis of the Cost Differences Between An Advertised and Instore Market Basket by Type and Location of Retail Grocery Firms in the Knoxville SMSA." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

Charles Happington
Major Professor

We have read this thesis
and recommend its acceptance:

James S. Shell

Raymond Donnell

Accepted for the Council:

Stetson A. Smith
Vice Chancellor for
Graduate Studies and Research

AN ANALYSIS OF THE COST DIFFERENCES BETWEEN AN ADVERTISED AND INSTORE
MARKET BASKET BY TYPE AND LOCATION OF RETAIL GROCERY
FIRMS IN THE KNOXVILLE SMSA

A Thesis
Presented to
the Graduate Council of
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ABSTRACT

The objectives of this study were (1) to determine the relative "price image" position by type of firm and by location in the Knoxville Standard Metropolitan Statistical Area as reflected through advertised prices, (2) to determine if the image projected through advertising reflects the true price position of the firm, and (3) to determine the degree of homogeneity of pricing practices within each type of firm, area and the giving of trading stamps.

Two sets of data were obtained: an average instore market basket using shelf prices collected from March through June, 1971, and an average advertised market basket collected using newspaper advertisements from January through June, 1971.

The data were analyzed by least-squares regression with (0, 1) dummy variables to handle type of firm, location, and trading stamps. The parameters of the model show the average effect of type store, location, and the use of trading stamps on the cost of an advertised and instore market basket. To compare the two sets of parameters an F ratio was calculated. The method of least squares regression analysis using only categorical dummy variables was equivalent to using analysis of variance. The analysis showed type of store, location and trading stamps to be nonsignificant in explaining the cost of an advertised and instore market basket at the .05 level. The results of the analysis showed a 15 percent difference between the highest and lowest advertised market basket cost but only a 4.5 percent difference with the instore market basket. The F ratio calculated to compare the

two sets of parameters showed the two sets of parameters to be significantly different at the .01 level.

The low R^2 's for the two sets of data indicated that the cells used in explaining the cost variation were not adequate and that individual firms within a type and area rather than the types of firms would be more effective in explaining the cost variation.

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CHAPTER I

INTRODUCTION AND PROCEDURES

I. INTRODUCTION

Consumers on the average spend around 17 percent of their disposable income on food expenditures (24, p. 17). Retail grocery stores compete for this business in a variety of ways: price, trading stamps, location, promotions, service, variety of items and so forth. In the past few years price has decreased in importance and has been surpassed by quality, services, and convenient location as criteria used by consumers in selecting a store (6, p. 125; 27, p. 127). While price was not the most important variable, it is certainly important.

Even if price were the only criterion from which the consumer makes the selection of store, it is still difficult to do comparison shopping on the many items a particular family purchases and, from a practical point of view, impossible on the 8,000-10,000 items stocked (24, p. 6) in most supermarkets.

One rather simple way a consumer might make price comparisons is through the use of advertised prices. The problem is that so few of the 8,000-10,000 items are advertised--around 50--and comparisons could conceivably be misleading. These advertised prices are used by the retail firms to create a "price image" for the firms; it is possible, however, that a firm intends to create a false image. For example, a firm may advertise a few items at relatively low prices and have many nonadvertised items priced at relatively high prices.

Retail grocery firms are often classified into national chains, regional chains, affiliate independents, independents and discount type firms. While the classification by type is arbitrary, the basic notion has been that each group has similar if not homogeneous pricing practices, while the real differences are between the groups. This basic notion has not been seriously challenged in the literature.

Often a very few firms dominate a city's grocery retailing. In the Knoxville Standard Metropolitan Statistical Area (SMSA), for example, the largest four and eight firms have 60.1 and 65.4 percent of the total retail food sales, respectively (23, p. 47). A study of these few firms, thus, becomes a study of the major portion of retail grocery expenditures in the area.

II. OBJECTIVES

The first objective of the study is to determine the relative "price image" position by type of firm and by location in the Knoxville Standard Metropolitan Statistical Area as projected through advertised prices. The second objective is to determine if an advertised "image," as projected through a firm's advertised prices, reflects the true relative price position of the firm. The third objective is to determine the degree of homogeneity of pricing practices within each type of firm, area and the giving of trading stamps.

III. REVIEW OF LITERATURE

Hirsch in 1956 compared prices of a wage earner's food market basket among supermarkets in a Midwestern city. The supermarkets were

divided into five groups: a national chain, a sectional chain, a local chain, a voluntary store and an independent store. The national chain was the lowest cost store and the independent store the highest. He also concluded that a wage earner's dollar did not go as far later in the week when "weekend" specials were advertised. The stores were relatively consistent in their price rankings over time (10, pp. 9-13).

Likewise, Holdren found the national chain to be priced consistently lower. He attributed most of the behavior to type of ownership and management of the firm (11, pp. 67-101).

According to the National Commission on Food Marketing, chains, especially national and large chains, have a lower priced market basket, even though their prices fluctuate less than do the prices of the small chain or independent stores. The Commission concluded that the chains have modified their policy from one of simple price competition to one which uses a promotional mix to fit the local situation. From this the Commission also concluded that the consumer seemed sensitive to nonprice offerings such as a variety of foods, carry-out services, convenient hours or stamps. Gross margin by type of retailer seemed to be related to multiple store units. The lower gross margins of the firms with multiple store units were attributed to economics of scale of warehousing and transportation (23, pp. 174-175).

Nelson found the kind of ownership to be related to price merchandising practices. He referred to this phenomenon as "variable price merchandising." He concluded that the price changes were done to draw attention to market offerings (26, pp. 172-186).

The structure of food retailing is usually considered that of an

oligopoly, and market concentration is usually high. With the concentration in the Knoxville SMSA, the market can be put into a category described by Bain as a moderately high concentrated oligopolistic core of a few sellers plus a large competitive fringe (2, p. 148). At first glance one would assume that in such a highly concentrated market a low degree of price competition would be evident. Mori and Gorman conducted a study of 22 Midwestern cities selected on the basis of degree of market concentration and extent of chain dominance. They concluded that the share held by the largest firms is not an effective variable in explaining difference in price levels. Competition was found to be effective even in highly concentrated or chain dominated areas and less in lower concentrated areas where competitive incentives were absent (21, pp. 162-171).

Preston conducted a study using advertised prices collected over a 23 week period. Preston noted that in contradiction to previous research that has been cited, the national chain was consistently above the market average on advertised prices (28, p. 168).

In 1966, Simonds compared the cost of a market basket of food in four cities and compared store types within each area. The study found significant differences among the cities and by the type of store. Simonds included discount stores since they had entered the food retailing market. The food market basket for the discount store was priced significantly lower than the national chain which was the second lowest type of store. There was no significant difference among prices in the national, regional or local food chains, but the market basket price in

the affiliate independent type was significantly higher than the other three. Simonds then concluded:

Thus it would appear that the discount food store has become an important factor in market structure. The low price image of some types may become more difficult to maintain if the discounter continues to grow in importance, and if price should become an important factor as families select a food store to shop (31, p. 98).

Simonds also pointed out that given a comparable quality of merchandise, the consumer did not tend to patronize the low-priced firm. The firm with the highest share of the market in no case had the lowest nor the next lowest market basket cost. In one particular city the firm with the highest market basket cost had the highest share of the market basket (31, p. 99).

In all of the studies reviewed only one firm from each type was used in comparing types of firms. The assumption was made that one firm of a particular type was representative of all other firms of that type. The studies then attributed the difference in a market basket cost to type of firm and did not examine to see if differences existed between the firms within a particular type.

IV. THE MARKET BASKET

Several different market baskets were used in the studies reviewed. The size varied from as few as 20 to 30 items to as many as 300. However, all except one of these baskets were collected using shelf prices and none of these studies contained nonfood items such as health and beauty aids or household supplies in their market baskets. Since nonfood items contribute around 21 percent of a store's total sales (24, p. 32), they were included in this study's market basket. Two different market

baskets were collected. An advertised market basket was collected to determine the firms' "price image" position and an instore market basket using shelf prices was collected to determine the firms' "true" price position in the market.

The advertised market basket consisted of 37 items selected on the basis of being frequently advertised by most of the firms. Since the purpose of the study is to establish a "price image" that the consumer might develop in observing grocery advertisements, no other criterion for selection was deemed relevant. A list of the items used in the advertised market basket is provided in the appendix.

Using advertised item prices presents difficulties since different stores advertise different brands and sizes. Since advertised prices are used to create an "image" of a firm's price position, the following method was used in collecting and recording the advertised items' prices.

The lowest priced name brand was used. If a name brand was not available, the comparable private brand was used. A standard size or count package was used for standardizing differences in sizes or count. If the item was not advertised in the standard size, it was adjusted to the standard. The advertised prices were collected from the period of January 4 through June 18 by using the following newspapers: The Oak Ridger, Maryville-Alcoa Daily Times, The Knoxville News-Sentinel, and The Knoxville Journal.

The prices used to make up the individual item prices were the average prices of the individual items during the collection period. For example, if an item was advertised n times, the recorded price would be calculated as follows:

$$\frac{1}{n} \sum_{i=1}^n P_i = \bar{P}_i$$

where:

P_i = the observed prices

n = the number of times the item was advertised during the
collection period

$\bar{P}_i$ = the average price of the i th item.

During the collection period, a few of the items in the advertised market basket were not advertised for individual firms. When an individual item was not advertised for a specific firm, the firm was given the market average for the item.

The data on the instore market basket were collected once a month for four months, March through June on the week of the 15th. Collecting the prices at the end of the week was done in order to let the firms have the opportunity to adjust their prices after the publishing of their competitors' prices in the newspaper during the first part of the week.

The instore market basket consisted of 94 items. The food items used in the instore market basket were mainly those items used in a 1966 study done by Simonds (31, pp. 107-113). This basket used items from the Bureau of Labor Statistics' food market basket and Economic Research Service market basket. Since these baskets did not include nonfood items that the consumer might purchase in a supermarket, a group of nonfood items was added by the author. Also, a few of the items in the food basket were changed to items that have entered the market since Simonds did her study. Originally the market basket consisted of 105 items, but 11 items were later deleted from the market basket due to

difficulty in standardization and availability of data in all the stores sampled. The purpose of the instore market basket was to establish the "true" price positions of the firms in the market. A four month average for each store in the market was then determined and recorded.

The total market basket is composed of the following seven product group headings: meat, dairy, bakery, produce, frozen, dry grocery, and nonfood items. Each group has a different weight which reflects the relative importance of that group in consumer spending in the retail grocery stores.

The average price of each product group in both baskets were then tabulated in the following manner:

$$\frac{1}{n} \sum_{i=1}^n \bar{P}_i = G_i$$

where:

$\bar{P}_i$ = the average price of the i th item in the group

n = the number of items in the product group

G_i = the average price of the i th product group.

After the average item price for each of the product groups for each basket was tabulated, the average price was weighted by the proportion of the total sales that the individual group contributed to the average stores' total sales as given in the Grocery Industry Barometer, 1969 (24, p. 32). See appendix.

The weighted total market basket cost for each basket was calculated in the following manner:

$$\sum_{i=1}^7 G_i W_i = TC = Y$$

where:

W_i = the weight for the i th group

TC = the total weighted cost of a market basket

Y = the dependent variable; i.e., the weighted cost of the market basket.

V. SAMPLED AREAS AND FIRMS

The Knoxville Standard Metropolitan Statistical Area was divided into three subsample areas using the center of trade and industry as a basis of division. These areas are also characterized by the circulation of the newspapers used to collect the prices for the advertised market basket. These areas were Knoxville, Oak Ridge, and Maryville-Alcoa.

The Knoxville SMSA has three national chains, two regional chains, three discount firms and several affiliate and nonaffiliate independents. The nonaffiliate independent firms were dropped from the study since they made up only a small proportion of the market sales and since nonaffiliate independent type firms did not advertise in the Knoxville newspapers used in the collecting of the data. Except for the nonaffiliate independent type firms, if a firm advertised in the newspapers, the firm was included in the study. One store of each firm in each of the three markets was treated as an observation. The same firms were used for the instore data.

In Knoxville, eight different firms advertised in the newspapers. Excluding the nonaffiliate independent type firms, in Oak Ridge, five firms advertised in the Oak Ridger, and in the Maryville-Alcoa area,

six firms advertised in the Maryville-Alcoa Daily Times. All stores for a particular firm in an area were assumed to have the same market basket cost. Thus, there were 19 observations for each market basket.

CHAPTER II

MODEL FORMULATION AND RESULTS

I. MODEL FORMULATION

Dependent Variables

The two main dependent variables regressed were the total weighted advertised market basket and the total weighted instore market basket cost. The analysis was also run using the individual group weighted prices as the dependent variable.

A list of the items used is provided in the appendix.

Independent Variables

Nine independent variables were utilized. These nine variables are dummy (0, 1) variables which are used to measure the effect of these qualitative variables on the dependent variable. In recording the data, if an observation fell into the category, it was given a 1; if not, the variable was given a 0. More specifically, the variables were as follows:

X_1 = a national chain type firm

X_2 = a regional chain type firm

X_3 = an affiliate independent type firm

X_4 = a discount type firm.

Variables X_1 through X_4 were used to measure the effect of a store type on the dependent variables.

X_5 = a new store. Three of the stores sampled had entered the market within the four months of the collection period. Their pricing

strategy was expected to be different from that of the older stores in the market.

X_6 = Knoxville

X_7 = Oak Ridge

X_8 = Maryville-Alcoa.

Variables X_6 through X_8 are used to establish the effect of location on the dependent variables.

X_9 = trading stamps. This variable is used to determine the effect of trading stamps on the cost of the market basket. This study makes no comparison as to the brand of the trading stamps used by the firms.

Model Formulation

Least squares method was used in estimating the regression coefficients, incorporating the use of dummy (0, 1) variables in order to determine if the type of firm is an effective variable in determining the cost of a market basket among the four types of firms as portrayed through instore and advertised market baskets.

In this type of regression each city and each firm type was represented by a separate independent variable.¹ The estimated coefficients for each variable measure the net effect of membership in that category on the dependent variable. The equation took the following form:

$$Y = b_0 + b_1X_1 + b_2X_2 + \dots + b_9X_9 + e$$

¹Due to the small number of observations, 19, there was a limit to the number of independent and interaction variables that could be used.

Both the instore and advertised weighted market basket total costs were regressed using the above equation.

To avoid singularity X_4 and X_8 were deleted from the model. This forces b_4 and b_8 to be 0.0. Therefore, the variation of a market basket cost was measured about these two variables. The value of b_4 and b_8 are found in the intercept b_0 . The mean market basket cost can then be tabulated by adding the corresponding regression coefficients. For example, the mean weighted cost of a market basket for the national type firms giving trading stamps in Knoxville would be equal to $b_0 + b_1 + b_6 + b_9$.

Since regression analysis using only categorical dummy variables was used, the analysis is equivalent to using analysis of variance (32, p. 77).

II. RESULTS

The model was run for both sets of data. Table I gives the results using the total instore and advertised weighted market basket cost as the dependent variable. None of the coefficients reported in Table I can be said to be different from zero with 95 percent confidence. More precisely, the prices of the weighted advertised and weighted instore market baskets of the national, regional and affiliate independent type firms were not significantly different from the discount type of firm. Similarly, no significant price differences were found in the prices of either the weighted market baskets of Knoxville and Oak Ridge as compared with Maryville-Alcoa. Nor did the giving of trading stamps have a significant effect as compared with

TABLE I
ESTIMATED PARAMETERS FOR THE COST OF THE ADVERTISED
AND INSTORE WEIGHTED MARKET BASKET

Dependent Variable	Regression Coefficients ^{abc}								Trading Stamps b ₉	R ²
	National Chain b ₀	b ₁	Regional Chain b ₂	Affiliate Independent b ₃	New Store b ₅	Knoxville b ₆	Oak Ridge b ₇			
Advertised basket cost	39.80	3.10 (2.89)	2.73 (3.11)	-.10 (3.22)	-1.92 (2.29)	2.36 (1.63)	.53 (2.33)	-3.27 (1.91)	.39	
Instore basket cost	51.88	2.09 (1.03)	2.53 (1.26)	.71 (1.03)	-.13 (.84)	-.28 (.59)	-.43 (.61)	-1.03 (.70)	.45	

^aStandard errors are in parentheses.

^bNone of the parameters were significant at the .05 level.

^c b_4 and b_8 are forced equal to 0.0.

stores not giving trading stamps. Some information, however, might be drawn by comparing signs and values of the coefficients.

Advertised Market Basket Prices

The estimated parameter for affiliate independent type firms was the only negative coefficient for those separating by type of firm, indicating that the affiliate independent had the lowest weighted total market basket cost. The national firm type appeared to have the highest weighted total advertised market basket, followed by the regional and discount type firms, respectively. Except for Preston (28, p. 52) the results were somewhat inconsistent with previous research cited. In the literature cited, the national type firms usually were the lowest or next lowest type. A possible reason for the phenomenon might be that other studies use only one chain to represent type. It was observed from the data that the highest individual and lowest individual firms in the Knoxville SMSA were national type firms.

The estimated coefficient for a new store, b_5 , was found not to be significant at the .05 level. The negative value of b_5 for the total weighted advertised market basket implies that a newer firm tended to have a lower total advertised weighted market basket cost as compared to the older firms in the market. A negative sign was expected since a new firm would be using specials and price reductions to attract customers and penetrate the market.

The estimated parameters for location (X_6 and X_7) show the relationship of Knoxville and Oak Ridge, respectively, to the deleted area, Maryville-Alcoa. Knoxville and Oak Ridge did not appear to be

significantly different from the Maryville-Alcoa area for the cost of the total weighted advertised market. The store managers of at least three of the firms indicated that prices are not made at the store level, and the Knoxville, Oak Ridge, and Maryville-Alcoa areas are either in the same or adjacent pricing zones. Also, in several of the advertisements, the prices were stated to be good in the particular firm's stores in all three areas. The signs and values of the coefficients for type indicated that Knoxville was the highest followed by Oak Ridge and Maryville-Alcoa, respectively, for the total weighted advertised market basket cost.

The value of the estimated coefficient for trading stamps, b_9 , was not significant for the weighted total advertised market basket cost. The negative sign implies that stores that give trading stamps had a lower average advertised weighted price as a whole than those that did not give trading stamps. However, the discount and affiliate independent types, which were observed to have the next lowest and lowest average weighted advertised market basket cost, respectively, did not give trading stamps. In all, 52.6 percent of the firms sampled gave trading stamps. Results of previous studies vary. One study concluded that ". . . trading stamps have no substantial effect on prices" (27, p. 157). The National Commission on Food Marketing concluded that the use of stamps increased store prices (23, p. 462). The Commission study was completed before the large growth in discount food stores. The lower price policy of the discounts could have forced competitors giving stamps to lower prices in order to compete effectively. In the Knoxville SMSA, there were four discount type stores. In a study

cited by Padberg, on the average, prices were higher in stores that gave trading stamps, but the results differed greatly among cities (27, p. 157).

To facilitate comparison of the coefficients, the mean weighted cost of the advertised market basket was computed for each category on which data were available. These costs were transformed into index numbers and are presented in Table II.

A national type firm not giving trading stamps in Knoxville had a 15 percent higher advertised market basket cost than a regional type firm that gave stamps in Maryville-Alcoa. Within a market area, however, the difference between the highest and the lowest types was 9 percent in all three areas. Disregarding the national type not giving trading stamps, the difference between the highest and lowest advertised total market basket cost was 7 percent, and within the markets the differences were just over 1 percent in all the areas. The effect of a new store on the index for the advertised market basket cost may be calculated by subtracting 4.9 points from the appropriate indexes in Table II.

Instore Market Basket Prices

The national, regional and affiliate independent types of firms were not significantly different from the discount type of firm at the .05 level when using the total weighted cost of the instore market basket as the dependent variable (Table I, page 14). However, the signs and values of the estimated parameters do give some indication as to the ranking of the types of firms when using the instore market basket. The estimated parameter for a regional type firm was the

TABLE II

AN INDEX OF THE COST OF THE TOTAL WEIGHTED ADVERTISED MARKET BASKET
BY TYPE OF FIRM, LOCATION AND USE OF TRADING STAMPS

Location	Type ^a	Stamps	
		With	Without
Knoxville	National	106.8	115.3
	Regional	106.0	b
	Affiliate Independent	b	107.1
	Discount	b	107.4
Oak Ridge	National	102.3	110.6
	Regional	101.3	b
	Affiliate Independent	b	102.5
	Discount	b	b
Maryville-Alcoa	National	100.9	109.3
	Regional	100.0	b
	Affiliate Independent	b	101.1
	Discount	b	101.4

^aFor a new store subtract 4.9 points.

^bNo data available for cell.

largest, followed by the national and affiliate independent type, respectively. This relationship indicates that the regional type had the highest weighted instore market basket cost followed by the national, affiliate independent, and the discount type firms, respectively. The estimated coefficients for Knoxville and Oak Ridge (X_6 and X_7 , respectively) were found not to be significant from that of Maryville-Alcoa using the instore weighted market basket cost as the dependent variable. Comparing the values and signs of b_6 and b_7 to that of b_8 which was forced to be 0.0, the analysis showed the Maryville-Alcoa area to have the highest instore market basket cost followed by the Oak Ridge and Knoxville areas, respectively.

Again to facilitate comparison of the coefficients for the instore data given in Table I, page 14, the mean weighted cost of the instore market basket was computed for each category on which data were available. These weighted costs were transformed into index numbers and are presented in Table III. The highest weighted instore market basket was the national type firm not giving stamps in Maryville-Alcoa. The difference was only 4.5 percent above the discount type firm in Knoxville, which had the lowest instore basket cost. Within the markets the difference between the lowest and highest instore basket costs were 4.0, 2.6, and 4.1 percent for Knoxville, Oak Ridge, and Maryville-Alcoa, respectively. The effect of a new store can be calculated by subtracting .3 percent from the approximate indexes in Table III.

Explanatory Powers of the Model

The R^2 for the advertised and instore total market basket cost as reported in Table I were .39 and .45, respectively. All of the

TABLE III

AN INDEX OF THE COST OF THE TOTAL WEIGHTED INSTORE MARKET BASKET
BY TYPE OF FIRM, LOCATION, AND USE OF TRADING STAMPS

Location	Type ^a	Stamps	
		With	Without
Knoxville	National	102.1	104.0
	Regional	102.9	b
	Affiliate Independent	b	101.4
	Discount	b	100.0
Oak Ridge	National	101.7	103.6
	Regional	102.6	b
	Affiliate Independent	b	101.0
	Discount	b	b
Maryville-Alcoa	National	102.5	104.5
	Regional	103.4	b
	Affiliate Independent	b	101.8
	Discount	b	100.4

^aFor a new store subtract .3 points.

^bNo data available for cell.

price variation in the price of each market basket is either within the cells or between the cells of Tables II (page 18) and III. The R^2 of .39 for the advertised market basket means that 39 percent of the price variation was between the several cells leaving 61 percent of the price variation within the cells. The R^2 of .45 has a similar interpretation.

Additional Results

The model was also run using the individual product groups from the instore and advertised market baskets as the dependent variable. The weighing of the product groups as explained in Chapter I does not have any effect on the results of the analysis for a particular group, but rather the weighing influences the results of the total cost of the market baskets. Some of the estimated parameters were significant at the .05 level. This indicates that type may have some effect on the individual product groups. However, when the product groups are weighted and totaled, the estimated parameters were not significant. The estimated parameters for the advertised individual product groups and the instore individual product groups are given in Tables V and VI, respectively, in the appendix.

III. A COMPARISON OF THE TWO MARKET BASKETS

Based on the instore data, the coefficients showed the regional type firm to have the highest basket cost, followed by the national type, affiliate independent type, and the discount type, respectively. The parameters for the advertised market basket gave the following ranking results from highest to lowest: the national type, regional type, discount type, and affiliate independent.

The highest advertised market basket cost was 15 percent greater than the lowest; with the instore market basket the highest was only 4.5 percent greater than the lowest instore basket cost. Thus, as can be seen from Tables II and III (pages 18 and 20), the percentage differences within the market and for the total market are smaller for the instore market basket cost than for the advertised market basket cost.

Since the two market basket prices were used as dependent variables in identically specified models, similar coefficients in the two models would have indicated a comparability of "price image" and true pricing. While there appear to be several differences between the corresponding coefficients of Table I, page 14, and Table II versus Table III, a test for equality was needed.

Johnston prescribes a method for calculating an F ratio to test for equality between the coefficients between two relationships (13, pp. 136-137). This procedure involves the following steps:

1. The weighted market basket costs for both baskets were pooled and by using least squares $\hat{b}$ was estimated. From this the sum of the squared residuals was computed, $Q_1 = Y'Y - \hat{b}'X'Y$.
2. Step 1 was then carried out for the two total weighted market basket costs separately and the two sums of squared residuals were totaled to obtain Q_2 .
3. Q_3 was then computed where $Q_3 = Q_1 - Q_2$.
4. The following F ratio was then calculated to test the hypothesis $b_1 = b_2$

$$F = \frac{Q_3/k}{Q_2/(m + n - 2k)}$$

with degrees of freedom (k, n + n - 2k) where:

m = the number of observations in the advertised market basket

n = the number of observations in the instore market basket

k = the number of variables plus one.

This method was deemed appropriate to test for differences between the coefficients for the weighted total instore and advertised market baskets. The ratio calculated was significant at the .01 level, thus rejecting the null hypothesis, $H_0 = \underline{b}_1 = \underline{b}_2$. Therefore, there appears to be a significant difference between the coefficients for the weighted total advertised market basket cost and the total instore market basket cost.

A rank correlation could not be calculated for type of store since there would only be four placings. However, a rank correlation was calculated in Table IV by using all 19 individual firms to test for a difference between the rankings of the total advertised weighted basket and the total instore weighted basket for individual firms. The correlation coefficient was calculated at $-.2105$ which shows an inverse relationship between the advertised ranking and the instore ranking of the basket cost. It can be seen in Table IV that national chain 1 in Maryville-Alcoa had the highest instore market basket, but had the lowest advertised market basket. This inverse relationship holds true for firm 1 in Knoxville and Oak Ridge. An opposite relationship holds true for firm 3. The d_1 's for the three discount firms were -1 , -8 , and -3 , indicating a close relationship between the two rankings for the type of firm. Firm 2 also had d_1 's of 0 , 2 , and 1 , indicating an extremely close relationship between the two rankings. However, firm 3

TABLE IV
CORRESPONDING RANKINGS USING INSTORE AND ADVERTISED
WEIGHTED TOTAL BASKET^a

Store Classification ^b	Location	Instore Ranking	Advertised Ranking	d ₁ ^c
1	Knoxville	17	3	14
2	Knoxville	14	14	--
3	Knoxville	4	17	-13
4	Knoxville	12	19	-7
5	Knoxville	10	12	-2
6	Knoxville	8	10	-2
7	Knoxville	7	8	-1
8	Knoxville	3	11	-8
1	Oak Ridge	11	2	9
2	Oak Ridge	18	16	2
3	Oak Ridge	2	18	-16
4	Oak Ridge	15	5	10
6	Oak Ridge	5	9	-4
1	Maryville-Alcoa	19	1	18
2	Maryville-Alcoa	16	15	1
3	Maryville-Alcoa	6	13	-7
4	Maryville-Alcoa	13	6	7
6	Maryville-Alcoa	9	7	2
8	Maryville-Alcoa	1	4	-3

$$R^2 = 1 - 6\sum d_1^2 / n(n^2 - 1) = 1 - 8280/6840 = -.2114.$$

^aRanked from lowest to highest with 1 being the lowest weighted total cost market basket and 19 being the highest.

^bStores 1, 2, 3 = national chains.
Store 6 = affiliate independent.
Stores 4, 5 = regional chains.
Stores 7, 8 = discount stores.

^cd₁ = instore ranking minus advertised ranking.

has d_i 's of -13, -16, and -8 for Knoxville, Oak Ridge, and Maryville-Alcoa, respectively. The d_i 's of firm 3 suggest that the instore ranking of firm 3 is lower than the firm's advertised ranking. Thus, if individual firms are compared, definite relationships can be seen.

Other Comparisons

The analysis of the instore market basket showed that the coefficients for a new store were negative and insignificant. This result was consistent with the advertised market basket cost. A new store would be expected to have a lower market basket cost in order to penetrate the market and attract customers. It can also be noticed in the analysis that a newer store had a larger effect on the advertised market basket than the instore market basket cost.

The regression coefficients for trading stamps, b_9 , were negative for both the advertised and instore total weighted basket costs. The analysis indicates that in the Knoxville SMSA, the stores that gave trading stamps had a lower, but not significantly lower, instore and advertised basket cost, ceteris paribus, than those stores that did not give trading stamps.

IV. LIMITATIONS OF THE ANALYSIS

Since supermarkets stock on the average 8,000 to 10,000 items (24, p. 6), it would be impractical to include all items in the instore sample. Similarly, over a span of 23 weeks, approximately 20,000 prices were advertised in the newspapers. These large numbers eliminate the practical use of all items in the market basket.

In a few cases, the same brands were not available in all stores to use in the advertised market basket. Also in the advertised market basket, a few firms did not advertise all the items used in the sample; thus it was necessary to give the firm the market mean price for the deleted item in order to include the store in the sample.

The above problem was not prevalent in the instore sample. However, if an item was not available, the same procedure was followed.

Quality differences may exist among brands advertised, or of the brands handled by the different stores. There may also be differences in general quality of the services offered by the stores. Quality was considered to be too subjective to be included in this study. Also, qualitative standards of acceptability may vary among consumers.

There were other means of weighing the product groups. Since items and size of groups varies between the two market baskets, the group items must be averaged and these averages used for comparing store types and between the two sources of data. It must be realized that these differences do exist as these findings are evaluated.

CHAPTER III

SUMMARY AND CONCLUSIONS

I. SUMMARY

A practical means of choosing a food store that a consumer has available is through newspaper advertisements. This research was an attempt to determine if advertised prices reflect a firm's true price position in the market. Type of firm was used as a means of classification to compare firms.

The objectives were (1) to determine the relative "price image" position by type of firm and by location in the Knoxville Standard Metropolitan Statistical Area as reflected through advertised prices, (2) if the image projected through advertising reflects the true price position of the firm, and (3) to determine the degree of homogeneity of pricing practices within each type of firm, area and with regard to stamps.

The findings of this study were based on two sets of data: an average instore market basket using shelf prices collected from March through June, 1971, and an average advertised market basket collected using newspaper advertisements from January through June, 1971.

The parameters of the model were estimated using the least squares method with dummy variables to handle type of firm, location, and trading stamps. The parameters of the model show the average effect of type of store, location and the use of trading stamps on the cost of an advertised and instore market basket.

The analysis showed type of store, location and trading stamps

insignificant in explaining the cost of an advertised and instore market basket at the .05 level.

Previous related research had only used one source of data to determine a market basket cost and only one firm to represent each type. This study used several firms in each type when available and two sources of data. The analysis in Tables II and III, pages 18 and 20) showed a 15 percent difference between the highest and lowest advertised market basket cost but only a 4.5 percent difference with the instore market basket. Although not significant at the .05 level, the parameters indicated, ceteris paribus, that the discount type firms had the next lowest advertised and the lowest instore market basket cost, respectively. It was also indicated that the national type firms had the highest and next highest advertised and instore market basket cost, respectively.

To compare the two sets of parameters, an F ratio was calculated which showed the two sets of parameters to be significantly different at the .01 level. A more detailed analysis in Table IV, page 24, showed an inverse relationship between the ranking of a firm's advertised market basket cost and that of its instore cost of a market basket.

The low R^2 's for the two sets of data indicate that the cells used in explaining the cost variation were not adequate. Individual firms within a type, area and the giving of trading stamps rather than among these cells for the firms would have been more effective in explaining the cost variation.

Newness of store and the use of trading stamps were shown to be insignificant at the .05 level. The negative sign of these two variables indicate that they have a negative effect on the weighted cost of the market baskets.

II. CONCLUSIONS

The results of analysis support the null hypothesis that after the effect of stamps has been accounted for, type of store and location in the Knoxville SMSA do not have a significant effect on the price "image" as portrayed through the weighted cost of the advertised market basket. Similarly, the analysis of the instore market basket supports the null hypothesis that type of firm and location in the Knoxville SMSA does not have a significant effect on the "true" price position of a firm as portrayed through the weighted cost of the instore market basket.

The results support the hypothesis that an image portrayed through a firm's advertisements does not reflect its true price position in the market. The contention that there exists a difference between the rankings of the two market baskets was even more evident when corresponding rankings of individual firms were compared.

In the model used to analyze the two market baskets for the Knoxville SMSA, low R^2 's were observed. These low R^2 's support the contention that the variation in the market basket costs exists within each cell rather than among the cells. Therefore, type of firm and location in the Knoxville SMSA were not effective variables in explaining the variation in the costs of the market baskets.

Therefore, the analysis indicates that the cost benefits between types of stores were nonsignificant and that consumers can use other qualitative criteria and personal preference in evaluating and choosing a type of firm to shop at in the Knoxville SMSA and not feel the extra

cost in a consumer's budget. Unless during a particular week a significant proportion of the consumer's shopping list was made up of a store's advertised specials, it will not necessarily give enough cost saving benefits to switch from her regular store of purchasing.

III. POSSIBILITIES FOR FUTURE RESEARCH

There are several possibilities open for future research in this area. Types of firms were shown in this study not to be significant at the .05 level, but large differences were observed between the rankings of the two baskets among individual firms within a particular type of firm. An analysis to determine differences between food retailing firms would prove to be interesting.

The differences were shown to be statistically not significant at the .05 level between types of firms, but research in the area of the price differences needed to affect a consumer's choice of stores could be very rewarding to a food retailing firm in forming price policies to meet competitive action.

Since the model used in explaining the cost variations had low R^2 's, further research would be beneficial in developing a model that would explain the variation in the market basket costs.

Similar studies could be conducted to evaluate nonprice competitive differences such as quality of product, general quality of store, services offered and other nonprice aspects that affects a consumer's decision on where to shop; such research might help a firm to develop a more effective product mix.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Alderson, Wroe. "Administered Prices and Retail Grocery Advertising," Journal of Advertising Research (March, 1963). Review in Journal of Marketing, X (October, 1963), 117.
2. Bain, Joe S. Industrial Organization. 2nd ed. New York: John Wiley and Sons, 1968.
3. Beem, Eugene R., and Oxenfeldt, A. R. "A Diversity Theory for Market Processes in Food Retailing," Journal of Farm Economics, XLVIII, No. 3, Part II (August, 1966), 69-95.
4. Burk, Marguerite. Consumption Economics: A Multidisciplinary Approach. New York: John Wiley and Sons, 1968.
5. Cassady, Ralph, Jr. Competition and Price Making in Food Retailing. New York: The Ronald Press Company, 1962.
6. Darrah, L. B. Food Marketing. New York: The Ronald Press Company, 1967.
7. Freund, John E. Mathematical Statistics. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962.
8. Gorman, William D., and Mori, Hiroshi. "Economic Theory and Explanation of Differences in Price Levels Among Local Retail Markets," Journal of Farm Economics, XLVIII, No. 5 (December, 1966), 1496-1502.
9. Hiemstra, Stephen J. "Concentration and Competition in Food Industries," Journal of Farm Economics, XLVIII, No. 3, Part II (August, 1966), 137-147.
10. Hirsch, Werner Z. "Grocery Chain Store Prices--A Case Study," Journal of Marketing, XXI, No. 1 (July, 1956), 9-23.
11. Holdren, Bob R. "Competition in Food Marketing," Journal of Farm Economics, XLVII (October, 1966), 1323-1331.
12. Holdren, Bob R. The Structure of a Retail Market and the Market Behavior of Retail Units. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960.
13. Johnston, J. Econometrics Methods. London, England: McGraw-Hill Book Company, Inc., 1963.
14. Knoxville Journal. January 4 through June 18, 1971.
15. Knoxville News Sentinel. January 4 through June 18, 1971.

16. Leeman, Martin. Food Retailing by Discount Houses. Marketing Research Report No. 785. Economic Research Service, U.S. Department of Agriculture. Washington: U.S. Government Printing Office, February, 1967.
17. Leftwich, Richard H. An Introduction to Economic Thinking. New York: Holt, Rinehart and Winston, 1969.
18. Lindgren, Donald R. "Pricing Practices of Food Supermarkets in Arizona," Arizona Business Bulletin (April, 1963). Reviewed in Journal of Farm Economics, XLVIII, No. 3, Part II (August, 1966), 122-136.
19. Maryville-Alcoa Daily Times. January 4 through June 18, 1971.
20. Morgan, Howard E. "Concentration in Food Retailing: Criteria and Causes," Journal of Farm Economics, XLVIII, No. 3, Part II (August, 1966), 122-136.
21. Mori, Hiroshi and Gorman, William D. "An Empirical Investigation into the Relationship Between Market Structure and Performance as Measured Prices," Journal of Farm Economics, XLVIII, No. 3, Part II (August, 1966), 162-171.
22. Naden, Kenneth D., and Jackson, George A., Jr. "Prices as Indicative of Competition Among Retail Food Stores," Journal of Farm Economics, XXXV, No. 2 (May, 1953), 236-248.
23. National Commission on Food Marketing. Organization and Competition in Food Retailing. Technical Study No. 7. Washington: U.S. Government Printing Office, June, 1966.
24. National Industrial Conference Board, Inc. Grocery Industry Barometer 1969. New York: Grocery Manufacturers of America, Inc., 1969.
25. The Oak Ridger. January 4 through June 18, 1971.
26. Nelson, Paul E., Jr. "Price Competition Among Retail Stores--Theory, Practices, Policy Cues," Journal of Farm Economics, XLVIII, Part II (August, 1966), 172-187.
27. Padberg, Daniel I. Economics of Food Retailing. Ithaca, New York: Cornell University Press, 1968.
28. Preston, Lee. Profits, Competition and Rules of Thumb in Retail Food Pricing. Berkeley, California: University of California Press, 1963.
29. Sappington, Charles. "A Numerical Example of the Practical Use of Dummy Variables," Southern Journal of Agricultural Economics, XII (December, 1970), 197-201.

30. U.S. Department of Agriculture. Economic Research Service.
National Food Situation. Washington: U.S. Government Printing
Office, February, 1970.
31. Simonds, Lois Ann. "A Study of the Variations in Food Costs in
Four Cities in Ohio." Unpublished Ph.D. dissertation, The
Ohio State University, 1966.
32. Wonnacott, Ronald J., and Wonnacott, Thomas H. Econometrics.
New York: John Wiley and Sons, 1970.

APPENDIX

ITEMS IN THE ADVERTISED MEAT BASKET

Meat Products

1. Chuck roast, bone in, one pound.
2. Bacon, sliced, one pound.
3. Ham, whole or shank half, bone in, fully cooked, one pound.
4. Frying chicken, cut up, one pound.
5. Bologna, 8 ounces.
6. Frankfurters or weiners, one pound.
7. Ground beef, excluding extra lean, one pound.
8. Pork chops, 1/4-1/2 loin, one pound.

Dairy Products and Eggs

1. Ice cream, 1/2 gallon.
2. Velveeta cheese, two pounds.
3. Eggs, grade A, large, one dozen.

Bakery Products

1. Bread, white, excluding sandwich bread, 20 ounce loaf.
2. Buns, weiner or hamburger, 8 count package.
3. Rolls, brown and serve, 12 ounce package.

Frozen Products

1. Meat pies, 8 ounce.
2. Pie shells, 2 count package.
3. Strawberries, 10 ounce package.
4. Potatoes, french or crinkle cut, one pound.

Produce Products

1. Head lettuce, one head.
2. Potatoes, white or Irish, 10 pounds.
3. Tomatoes, one pound.
4. Sweet corn, white or yellow, one ear.
5. Yellow onions or cooking onions, one pound.
6. Pole beans, one pound.
7. bananas, one pound

Grocery Products

1. Baby food, 4 1/2 ounces.
2. Catsup, 14 ounces.
3. Peas, 16 ounces.
4. Fruit cocktail, 16 ounces.
5. Vegetable shortening, 16 ounces.
6. Corn, 16 ounces.
7. Margarine, one pound carton, exclude soft and whipped.
8. Sugar, cane or beet, 5 pounds.

Nonfood Products

1. Laundry detergent, giant size or 49 ounces.
2. Paper towels, jumbo roll.
3. Spray deodorant, 4 ounces.
4. Dog food, 15 ounce can.

ITEMS IN THE INSTORE MARKET BASKET

Meat Products

1. Round steak, bone in, or if not available, boneless, U.S. Choice or U.S. Good or U.S. Prime if Choice is not available, one pound.
2. Sirloin steak, bone in, U.S. Choice, or U.S. Good or U.S. Prime if Choice is not available, one pound.
3. Porterhouse steak, bone in, U.S. Choice, or U.S. Good or U.S. Prime if Choice is not available, one pound.
4. Rump roast, standing, boneless, or bone in if boneless is not available, U.S. Choice, or U.S. Good or U.S. Prime if Choice is not available, one pound.
5. Rib roast, standing, short cut (7 inch) bone in, U.S. Choice, or U.S. Good or U.S. Prime if Choice is not available, one pound.
6. Chuck roast, bone in blade pot roast, or boneless or semi-boneless if bone in is not available, U.S. Choice, or U.S. Good or U.S. Prime if Choice is not available, one pound.
7. Ground beef, pre-ground and ready for sale (not hamburger), if not available price ground chuck, but exclude ground round steak and meat patties, one pound.
8. Pork chops, cut from center of loin (if both center cut loin and center cut ribs are sold, price center cut loin, otherwise price either cut), exclude blade and sirloin chops, one pound.
9. Pork roast, loin half cut from pork loins weighing 8 to 12 pounds, exclude center cut roast, one pound.
10. Pork sausage, fresh, one pound bag or roll, exclude sausage links and unpackaged (loose) sausage. Selecto or Lays.
11. Ham, whole, ready-to-eat, weighing between 10 and 16 pounds, if whole hams are not available, obtain price for shank half (with no slices removed), best quality, one pound, exclude skinless, shankless, defatted, and boneless ham.
12. Bacon, sliced, and packaged, best quality, one pound package, Sugardale, Swift, Armour, Kahn, and other packers, but do not price store brand.

13. Picnics, smoked, the lower end of the shoulder, bone in, skin on, short shank, may be called "calla" ham, best quality, one pound exclude boston butts, rolled picnics.
14. Frankfurters, or weiners, skinless, containing a combination of beef, pork, and veal, packaged, 16 ounces, exclude frankfurters with hog casing, cereal added, and all beef, Sugardale, Swift, Armour, Kahn, and other packers but do not price store brand.
15. Bologna, prepackaged, sliced, all meat, 3 to 5 inches in diameter, 5 to 11 ounce package, do not price store brand, but best of packers.
16. Salami, prepackaged, sliced, 3 to 5 inches in diameter, 5 to 11 ounce package, exclude Genoa salami and thuringer, do not price store brand, but best of packers.
17. Frying chicken, ready-to-cook, whole, weighing about 1 3/4 to 2 3/4 pounds, if whole chicken is not available, price cut up chicken, if fresh is not available, price frozen, Grade A or best quality, one pound.
18. Chicken breasts, fresh or frozen, prepackaged, may have rib cage attached (quarter chicken), if prepackaged not available, price unpackaged, Grade A or best quality, one pound.
19. Turkey, fresh, ready-to-cook, weighing 8 to 16 pounds, if fresh is not available, price frozen, Grade A or best, one pound, exclude fryers.
20. Shrimp. prepackaged, frozen, raw, breaded, if not available price peeled and deveined or shell-on, 10 ounce package, exclude cooked, ready-to-heat shrimp.
21. Ocean perch, fillet, frozen, prepackaged, unbreaded, 16 ounce package.
22. Haddock, fillet, frozen, prepackaged, unbreaded, 16 ounce package.
23. Tuna fish, canned, fancy light meat, chunk style, packed in oil, 6 1/4 ounce can, exclude white meat tuna or albacore, flaked or grated tuna, tunno ot Italian style tuna, Del Monte or Star Kist.
24. Sardines, canned, Maine, packed in vegetable oil, mustard or tomato sauce, 3 3/4 to 4 ounce can, exclude sardines packed in olive oil, imported, and California sardines.

Dairy Products and Eggs

1. Milk, fresh, pasteurized, homogenized, vitamin D added (sold in stores), 3.5 percent butterfat, quart or half gallon carton or bottle, exclude premium priced milk, do not include bottle deposit in price reported.
2. Milk, fresh skimmed, containing not more than 0.2 percent milk fat; may be fortified with additional milk solids, may have vitamins A and D added, quart or half gallon carton or bottle.
3. Milk, canned, evaporated, unsweetened, 14 1/2 ounce can, exclude sweetened condensed milk.
4. Ice cream, prepackaged vanilla or chocolate, half-gallon, exclude ice milk and special types such as French style.
5. Cheese, American process, pasteurized, this is always labeled "American Process," Kraft, 8 ounces, sliced, prepackaged.
6. Butter, salted, Land O'Lakes, one pound package, exclude whipped butter.
7. Eggs, large Grade A, one dozen.

Bakery Products

1. Bread, white sliced and wrapped, 16 or 20 ounce loaf, specify weight.
2. Bread, whole or cracked wheat, sliced and wrapped, 16 ounce loaf, exclude rye, pumpernickel, and other dark breads and diet breads.
3. Layer cake, iced, white or chocolate, exclude on-premise bakery cakes, 16 ounce bag or box, Oreo or Sunshine.

Frozen Products

1. Orange juice, frozen, 1 to 3 concentration, Minute Maid, 6 ounce can.
2. Lemonade, frozen, 1 to 4 or 4 1/2 concentration, 6 ounce can.
3. Broccoli spears, frozen, Birds Eye, 10 ounce package, exclude frozen broccluts, broccoli with sauce and/or seasonings, and broccoli packaged in a cooking pouch.
4. Potatoes, french fried, frozen, Birds Eye, 9 ounce package.
5. Peas, frozen, Birds Eye, 10 ounce package, exclude peas with sauce and/or seasonings, and peas packaged in a cooking pouch.

Produce Products

1. Bananas, first quality, one pound.
2. Oranges, any variety except Temple, U.S. No. 1, size 176 to 220, or nearest size, one dozen, but report price per pound or each if so sold.
3. Grapefruit, fresh, pink or white, seeded or seedless, U.S. No. 1, size 64 to 96, or nearest size, each, but price per pound or dozen if so sold.
4. Grapes, Red Emperor, best quality, one pound.
5. Lemons, pound, or price by dozen or half-dozen if so priced.
6. Potatoes, white or Irish, all varieties, red skinned potatoes are acceptable, U.S. No. 1, 10 pounds, exclude large size, select baking potatoes selling at premium price.
7. Asparagus, fresh, well-trimmed, price best quality, one pound, if sold by the bunch, report that price and specify weight.
8. Cabbage, all varieties except red, standard trim, one pound, if sold by the head, report that price and specify weight.
9. Carrots, prepackaged, topped, all varieties, one pound.
10. Celery, pascal, report price per stalk (average size 30), exclude celery hearts.
11. Head lettuce, all varieties, 24's, or nearest size available, one head.
12. Green peppers, one pound, if not sold by pound report price per pepper.
13. Tomatoes, U.S. No. 1, or best quality, one pound, excludes greenhouse, unless no others available to meet specifications.
14. Onions, common yellow dry cooking globe type, all varieties, U.S. No. 1, one pound, exclude Bermuda and Spanish onions.

Grocery Products

1. Flour, all purpose, white, Betty Crocker or Pillsbury, 5 pound sack.
2. Cornmeal, enriched/bolted white, Three Rivers, 5 pound bag.
3. Corn flakes, 12 ounce package, Kellogg's, exclude sugar coated.
4. Rice, white, long grain, regular (if not available, price quick-cooking), 16 ounce package, exclude bulk and converted rice.
5. Cream sandwich cookies, machine made with cream filling, chocolate, 16 ounce bag or box, Oreo or Sunshine.

6. Orange juice, fresh or fresh reconstituted, quart bottle or price per carton.
7. Fruit cocktail, canned, packed in heavy syrup, Del Monte, Hunt, Stokely, No. 303 can, exclude mixtures not labeled fruit cocktail.
8. Pears, bartlett, canned halves in heavy syrup, Del Monte, Hunt, Stokely, No. 2 1/2 can, excludes spiced pears.
9. Peaches, canned, cling, halves, packed in heavy syrup, Del Monte, Hunt, Stokely, No. 2 1/2 can.
10. Pineapple-grapefruit juice drink, contains water concentrated pineapple and grapefruit juices, nutritive, sweeteners, citric acid, and preservatives, Del Monte, Stokely, 46 ounce can.
11. Beets, sliced can or jar, Del Monte, Stokely, No. 303 can, or one pound glass jar, exclude whole, diced french cut, spiced, pickled, and Harvard beets.
12. Corn, canned, whole kernel, yellow, Del Monte, Stokely, No. 303 can exclude cream style, and white corn.
13. Peas, canned, Del Monte, Stokely, sweet or sugar peas, any sieve size, No. 303 can, exclude Alaska or Early June varieties.
14. Tomatoes, canned, Del Monte, Stokely, small and large pieces, No. 303 can, exclude solid pack or whole tomatoes unless no other available.
15. Dried navy beans, one pound package, or nearest size package.
16. Margarine, colored, Blue Bonnet, one pound carton, excludes margarine made from 100 percent corn or safflower oil, and whipped margarine.
17. Margarine, Soft Chiffon, one pound tub.
18. Peanut butter, cream style, 12 ounce jar, Peter Pan or Skippy.
19. Salad dressing, Italian style, Kraft containing vegetable oil, vinegar, lemon juice, garlic, and spices, 8 ounce bottle, exclude oil and vinegar dressings not labeled "Italian," and Italian style dressing made with 100 percent safflower oil.
20. Salad or cooking oil, Wesson, all vegetable oil, may be cottonseed, corn, peanut, or soybean, or a blend, pint bottle, exclude safflower oil.

21. Vegetable shortening, 3 pound can, Crisco or Spry.
22. Sugar, Domino or Jack Frost, white, granulated, cane or beet, 5 pound, exclude lump or cube.
23. Grape jelly, Welch or Kraft, 10 ounce jar.
24. Chocolate flavored syrup, Hershey, made with cocoa and artificial vanilla flavor, 16 ounce can exclude hot fudge topping, fortified syrups.
25. Coffee, roasted in air tight can, Maxwell House, one pound, exclude decaffeinated coffee.
26. Coffee, freeze-dried, Maxim, 4 ounce jar.
27. Tea bags, Lipton, orange pekoe tea, packaged in individual service bags, package of 48 bags.
28. Cola drink, Pepsi, cola flavored carbonated beverage in bottles, carton of 6 to 8 bottles, 10 to 12 ounce size, exclude bottle deposit and diet cola.
29. Carbonated beverage, fruit flavored in bottles, carton of 6 to 8 bottles, 10 to 12 ounce size exclude bottle deposit or diet beverage.
30. Bean soup, canned, Campbell, condensed, made with white Navy or pea beans and flavored with bacon, ham, or smoked pork, 11 1/4 ounce can, exclude vegetarian bean soup.
31. Chicken soup, canned, Campbell, condensed, with rice or noodles, 10 1/2 ounce can.
32. Spaghetti, in tomato sauce, canned, may contain cheese, Franco American in 15 1/4 ounce can, exclude canned spaghetti with meat balls, in meat sauce, or fancy type packs as Italian style.
33. Baby food, strained, Gerber or Beechnut, strained mixtures of vegetables with beef, lamb, bacon or liver, 4 1/2 ounce jar or can.
34. Pretzels, hard, salted, sticks or twisted, 7 ounce package.

Nonfood Products

1. Charmin bathroom tissue, white, 2 roll package.
2. Scott paper towels, 1 roll package.
3. Tide, king size.

4. Ivory Liquid diswashing detergent, 12 ounce bottle.
5. Dial bath soap, bath size, 1 bar.
6. Clorox liquid bleach, 1/2 gallon.
7. Purina Cat Chow, 4 pound bag.
8. Alpo liver dog food, 14 1/2 ounce can.

TABLE V

ESTIMATED PARAMETERS FOR THE AVERAGE WEIGHTED ADVERTISED MARKET BASKET COST, MEAT, DAIRY, BAKERY, FROZEN, PRODUCE, GROCERY AND NONFOOD PRODUCT GROUP COST

Dependent Variable	b_0	Regression Coefficients abc							R^2
		National Chain b_1	Regional Chain b_2	Affiliate Independent b_3	New Store b_5	Knoxville b_6	Oak Ridge b_7	Trading Stamps b_9	
Total	39.80	3.10 (2.89)	2.73 (3.11)	-.10 (3.22)	-1.92 (2.29)	2.36 (1.63)	.53 (2.33)	-3.27 (1.91)	.39
Meat	10.58	1.40 (.84)	.58 (.90)	1.09 (.94)	-.19 (.67)	.62 (.48)	.24 (.68)	-.25 (.55)	.42
Dairy	4.73	.08 (.30)	.17 (.32)	-.26 (.33)	-.07 (.24)	.04 (.16)	.16 (.24)	-.10 (.19)	.26
Bakery	2.10	.04 (.19)	.02 (.20)	-.44 (.21)	-.14 (.15)	.12 (.10)	.06 (.16)	-.15 (.13)	.51
Frozen	1.12	.02 (.14)	-.02 (.15)	-.01 (.16)	-.07 (.11)	.17 (.08)	.001 (.11)	-.06 (.09)	.42

TABLE V (continued)

Dependent Variable	Regression Coefficients ^{abc}								R ²
	National Chain b_0	National Chain b_1	Regional Chain b_2	Affiliate Independent b_3	New Store b_5	Knoxville b_6	Oak Ridge b_7	Trading Stamps b_9	
Produce	2.85	-.14 (.33)	-.36 (.36)	.13 (.36)	.06 (.26)	.13 (.19)	-.09 (.26)	-.43 (.22)	.34
Grocery	8.46	1.15 (1.16)	.94 (1.25)	.22 (1.30)	-.61 (.92)	.72 (.66)	.10 (.94)	-1.07 (.77)	.29
Nonfood	9.96	.55 (.90)	1.41 (.97)	-.84 (1.00)	-.90 (.72)	.51 (1.62)	.07 (.73)	-1.59 (.60)	.54

^aStandard errors are in parentheses.

^bNone of the coefficients are significant at the .05 level.

^cVariables b_4 and b_8 are forced equal to 0.0.

TABLE VI

ESTIMATED PARAMETERS FOR THE AVERAGE WEIGHTED INSTORE MARKET BASKET COST, MEAT, DAIRY, BAKERY,
FROZEN, PRODUCE, GROCERY AND NONFOOD, PRODUCT GROUP COST

Dependent Variable	Regression Coefficients abc								R ²
	National Chain b ₀	b ₁	Regional Chain b ₂	Affiliate Independent b ₃	New Store b ₅	Knoxville b ₆	Oak Ridge b ₇	Trading Stamps b ₉	
Total	51.88	.04 (1.03)	2.55 (1.26)	.71 (1.03)	-.13 (.84)	-.23 (.54)	-.43 (.61)	-1.03 (.70)	.45
Meat	18.21	.004 (.20)	.09 (.25)	-.58 (.20)*	-.46 (.16)*	.003 (.10)	.11 (.12)	-.67 (.14)*	.79
Dairy	3.67	.19 (.06)*	.25 (.08)*	.09 (.06)	-.05 (.05)	.07 (.03)*	.03 (.04)	.06 (.04)	.66
Bakery	1.89	.06 (.07)	.06 (.09)	.13 (.07)	-.04 (.06)	-.13 (.03)	-.10 (.04)*	-.0009 (.05)	.67
Frozen	1.02	.03 (.04)	.06 (.05)	.02 (.04)	.01 (.03)	.01 (.02)	.03 (.02)	-.01 (.03)	.44

TABLE VI (continued)

Dependent Variable	b_0	Regression Coefficients ^{abc}						R^2
		National Chain b_1	Regional Chain b_2	Affiliate Independent b_3	New Store b_5	Knoxville b_6	Oak Ridge b_7	Trading Stamps b_9
Produce	3.72	-.16 (.13)	-.57 (.16)*	-.50 (.13)*	-.20 (.11)	-.04 (.07)	.02 (.08)	.14 (.09)
Grocery	11.66	.75 (.38)	1.00 (.47)	.84 (.38)*	.21 (.31)	-.09 (.27)	-.27 (.31)	-.06 (.26)
Nonfood	11.72	1.21 (.52)*	1.67 (.64)*	.75 (.52)	.29 (.42)	-.05 (.27)	-.25 (.31)	-.37 (.35)

^aStandard errors are in parentheses.^b*Significant at the .05 level.^cVariables b_4 and b_8 are forced equal to 0.0.

TABLE VII
DISTRIBUTION OF TOTAL STORE SALES BY PRODUCT GROUP

Product Group	Distribution by Percentage
Meat	22.41
Dairy	6.58
Bakery	6.91
Frozen	4.71
Produce	10.71
Grocery	27.71
Nonfood	<u>21.66</u>
Total	100.00

Source: National Industrial Conference Board, Inc.,
Grocery Industry Barometer 1969 (New York: Grocery Manufac-
turers of America, Inc., 1969).

VITA

Dwight E. Phillips was born in Fredericktown, Ohio, on June 26, 1948, the son of Mr. and Mrs. Lloyd C. Phillips. He graduated from Fredericktown High School in May, 1966, and entered The Ohio State University in June, 1966, where he majored in Agricultural Economics. He was graduated from The Ohio State University in December, 1969, with a Bachelor of Science degree in Agricultural Economics and earned an officer's commission in the United States Army Reserves.

In January, 1969, he entered the Graduate School of the University of Tennessee as an Assistant in Agricultural Economics and Rural Sociology and received the Master of Science degree with a major in Agricultural Economics in December, 1971. He is a member of Towers agricultural honorary, Gamma Sigma Delta agricultural honorary, and Thrall Masonic Lodge.

He is married to the former Sharon L. Szabo of Fredericktown, Ohio.