PERFORMING A PRELIMINARY MARKET DEMAND ANALYSIS

- A FOOD MARKET CASE STUDY -

by

Daymon W. Thatch, Associate Professor
and
Kelly L. Brewster, Graduate Student
Agricultural Economics and Marketing
Rutgers - The State University of New Jersey
New Brunswick, New Jersey

The study presents a modified market analysis approach which could be very useful for those firms with limited available resources for that purpose.

Background

Over the past two decades, food supermarkets and many retail stores have been moving from the more populated urban areas to the suburban areas. There are several problems which have contributed to this migration such as increased procurement and handling costs, lack of parking facilities, higher costs for real estate, higher costs of pilferage and vandalism.

Based on the 1980 census report, the City of New Brunswick, New Jersey had an estimated population of 41,400 in a 5.6 square mile area. The population was fairly heterogeneous with a number of minority groups and a full range of incomes and yet no one major food supermarket currently exists in the city, although there were several in past years. In an effort to better serve the people of the New Brunswick area with convenient and reasonable priced food, a steering committee of concerned citizens was formed to evaluate the possibility of starting a food cooperative with similar size and range of products as a small supermarket chain store.

Although efforts are well underway, one major obstacle in the effort to obtain a bank loan from the National Consumer Cooperative Bank was the bank's need for a "feasibility" study evaluating the area's potential to support a food cooperative. Due to lack of funds for an extensive market study and unavailability of Federal funds, the New Brunswick Steering Committee approached the Department of Agricultural Economics at Cook College, Rutgers University in an effort to obtain some assistance in gathering data that could serve the bank's requirements for a preliminary market demand study.

The study that resulted from this request, "Preliminary Market Demand Analysis for a Supermarket in New Brunswick, New Jersey," was published through the New Jersey Agricultural Experiment Station, Publication No. P-02010-1-83. It is the purpose of this paper to present a general methodology, via the New Brunswick Case Study, that can be used by other private and public groups in assessing the preliminary sales potential of an area.

Statement of the Problem

Potential demand studies for business are not readily available. Approaches for determining optimum store locations have been researched and published; however, specific studies on a given area are usually done by chain store personnel or consultants for these firms. The exact methodoloyg and criteria are often highly personal. Economic conditions and the individual goals of different businesses are ever changing and diverse; as a result, each study has a different criteria for the evaluation of an area. William Applebaum, in Guide to Store Location Research, states:

> Thus far, unfortunately, we lack demonstration of how these (demand study) concepts can be of practical use in metropolitan areas in evaluating a given site as to its sales potential. The published literature does not provide enough of the measurement standards needed. But a great deal of data exists as the private property of business firms. The professional store location researcher working for or as a consultant to these firms, has access to their data.[1]

Due to the fact that this study did not have access to specific store data or wealth of previous studies and with limited funding, it was necessary to develop a methodology based on literature available to meet the needs of the project. In a related study it was found that,

> Organizations engaged in . . . community revitalization efforts have often found they needed a market analysis to assist them in their efforts. These organizations, however, cannot usually afford the large fees a consulting firm would charge for a full scale market study . . . It might be useful to start with a preliminary analysis that can be conducted by someone within the organization.[2]

It is hoped that the procedure developed and set forth in this report will fill this void and provide a low cost means of determining potential sales.

The specific problem to be investigated in the case study was - What does a preliminary market analysis of New Brunswick, New Jersey reveal about the potential demand of establishing a food cooperative in 1982? In short, the problem dealt with the "able" or sale potential part of demand and no effort was made to determine if the population was "willing" to buy or the cost involved in a potential operation.

Objectives

Three objectives had been defined: (1) evaluate past food co-op demand feasibility studies, related literature, and discussions with consultants to determine data needs; (2) collect needed secondary data; and (3) present data and recommendations.

Limitations

It should be stressed that this study is a preliminary market study to assess characteristics of the given population which would be indicative of the sales potential. Secondary data were used. There was no attempt to make a full-scale market study using primary data in which consumer buying habits, traffic analyses, location decisions, cost estimations, etc. could have been determined. Extensive demand studies are obviously more valuable, but costly and it is for this express purpose that this study was made -- that is, to develop a methodology which would be faster and less costly and could indicate if a full market study was warranted.

Methodology

The specific articles which were used to develop the methodology are not discussed in detail, but are listed in the references section. In addition to the published articles, a number of unpublished references and discussions with knowledgable personnel are also documented. The justifications of the methodology based on the articles and discussions are presented in detail in the New Jersey Agricultural Experiment Station publication P-02010-0-83.

Based on the literature and discussions, the following methodology was developed to determine the size of a food store which the case study site of New Brunswick, New Jersey would be able to support. Seven major steps are used: (1) Determination of the trade area: the initial step was to obtain a Hagstrom map of New Brunswick and to plot the lcoation of supermarkets within a one-mile area. There are two food supermarkets in the general New Brunswick area, a Foodtown at Livingston Avenue and Elizabeth Street in North Brunswick and a Grand Union on Georges and Milltown Roads in North Brunswick. The primary trade area was assumed to be one-half mile radius around the existing supermarkets and secondary trade area from one-half to one mile concentric circle about the supermarkets. The area not within primary or secondary trade areas of an existing supermarket was considered the trade area to be investigated for a potential food supermarket within the City of New Brunswick.

The Raritan River and Buccleuch Park create natural boundaries which also strive to define the trade area. In the study, "Analyzing Neighborhood Retail Opportunities: A Guide for Carrying Out a Preliminary Market Study," it was suggested that distance, physical barriers such as parks, railways and expressways and natural barriers should all be taken into consideration in determining trade areas.[3] (2) The population within the potential trade area was determined by mapping the areas of the census tracts of New Brunswick. The tracts which best represented the trade areas were then researched for demographic data. Population was found for each tract within the trade areas and added for total population in potential trade areas. It was assumed that a new facility would draw some customers away from the competitor's secondary trade area. Part of Foodtown's secondary trade area was considered as the secondary trade area for the potential store. (3) Consumers' income was determined using the 1980 census information. Median income was used for households within each census tract. These incomes were then summed and averaged to obtain a median income for both the potential primary and secondary trade areas. (4) Consumer expenditures on food within each area was determined based on the median income values and average household size. A study by the U.S. Department of Labor Statistics, "A Consumer Expenditure Survey, Integrated Diary and Interview Survey Data,"[4] related these variables to expenditures by different category of stores. (5) Total retail demand available for the potential food store in the primary and secondary trade areas was determined by multiplying the population by yearly per capita expenditures on food. (6) Sales potential was calculated by multiplying the total demand available determined in step 5 by potential capture rate or market penetration. Within the potential primary trade area there are no large food supermarkets so competition is minimal. However, the smaller corner grocery stores do have a strong following in the New Brunswick area due to ethnicity of some sections and their specialty foods.

> In most metropolitan areas, approximately 25 percent of the food dollar can be expected to go to small 'ma and pa' grocery stores, Krauszers, 7-11, etc, leaving 75

> percent for larger stores. For supermarkets of 30,000 to 60,000 square feet, it is considered very good to draw 30-40 percent of the food dollar in an area; sometimes their share can be as low as 5 to 10 percent. However, these fixed share numbers are not readily available.[5]

The sales potential was determined under different assumptions and are presented in a decision matrix. (7) Once sales potential was determined, it was divided by median sales per square foot to give the total square footage that a store can be expected to support. Based on a study in 1978 by Urban Land Institute called "Dollars and Cents of Shopping Centers,"[6] the median sales volume per square foot of gross leasable area of supermarkets was $180 (inflated by Consumer Price Index to 1980 values would be equal to $225.7).

Results

The results of this study are presented in Tables 1 and 2 under three major groupings: demographics of the potential trade area, consumers' weekly food expenditures in the potential trade area, and decision matrix for potential food supermarket sizes.

Demographic of the Potential Trade Area

Selected demographic variables by individual census tracts for New Brunswick, New Jersey were proportioned and summarized and are presented in Table 1. The data in Table 1 were also presented by both primary and secondary areas to allow for various population capture rates.

Consumers' Weekly Food Expenditures in the Potential Trade Area

Per capita weekly expenditures on food in the potential primary trade area and potential secondary trade area were determined by four (4) different methods (see Appendix). Although all calculations were based on relatively conservative consumption figures, the ranges of the results, total yearly expenditures on food, were fairly large--from $15,799,574 to $24,830,442 in the primary area and $3,640,511 to $5,894,210 in the secondary area.

The value computed by the following procedure was the most conservative, and so was chosen for all final calculations in the decision matrix. Since all income and expenditures are based on 1980 prices, some slight differences would occur if inflated to 1983 values. The ratio, however, between expenditures for food and income earned will probably change very little, and the general decision and recommendation would not be affected because of the fairly conservative estimates used throughout the report.

The determination of per capita expenditures on food for potential primary and secondary trade areas were based on the study by the U.S. Department of Labor Statistics, "A Consumer Expenditure Survey, Integrated Diary and Interview Survey Data," (see Footnote 4) in which incomes and household sites were related to the percentage of income which would be spent on food and other categories of expenditures. From Table 1, based on certain census tract characteristics, one can see the median income per household and average number of persons per household in the primary and secondary trade areas, respectively, were 12,110.60 and 2.47; 13,535.50 and 2.62. From the relationships in the U.S. Department of Labor Statistics study, it was determined that in the potential primary trade area 16.7 percent of the income would be spent on food at home.

Therefore, in the primary area $12,110.60 x 16.7% = $2,022.47 spent per family per year on food at home. $2,022.47 ÷ 2.5 persons per household = $808.99/capita/year expenditures on food.

Table 1. Census Tract Data Used for Potential Food Supermarket Trade Areas, New Brunswick, New Jersey

Trade Area	Variable						
	Total Population	Number of Families	Average # of Persons per Household	Median Income per Household	Median Age	Population by Race	
						White	Black
Primary Trade Area	19,530	3,164	2.47	12,110.60	24.95	12,752	5,036
Secondary Trade Area	4,636	965	2.62	13,535.50	27.80	2,677	1,289

Source: 1980 Census Tract Data from New Brunswick, New Jersey Planning Board, Municipal Building, Bayard Street, New Brunswick, New Jersey.

Table 2. Food Supermarket Supportable Square Footage Decision Matrix

Capture Rate	Variables: Per Capita Yearly Expenditures on Food	X Population =	Area Yearly Total Sales Potential	Market Penetration or X Capture Rate =	Yearly Store Sales Potential	(225.70) =	Supportable Square Footage (GLA)
	$100	1,000	$1 million	Percent	$1 million		1,000 sq. ft.
60% Capture Rate of Primary Trade Area	8.09	19.53	15.80	60	9.48		46.84
30% Capture Rate of Secondary Trade Area	7.85	4.64	3.64	30	1.09	10.57	
50% Primary	8.09	19.53	15.80	50	7.90		38.28
20% Secondary	7.85	4.64	3.64	20	.73	8.63	
40% Primary	8.09	19.53	15.80	40	6.32		29.61
10% Secondary	7.85	4.64	3.64	10	.36	6.68	
30% Primary	8.09	19.53	15.80	30	4.74		21.00
0% Secondary	--	--	--	--	--		
20% Primary	8.09	19.53	15.80	20	3.16		14.00
0% Secondary	--	--	--	--	--		

Note: Numbers do not add to totals because of rounding.

Source: Noted in article.

The same procedure was used for the secondary trade area. Based on $13,535.50 as the median income and 2.62 as average number of persons per household, the percentage spent on food would be 15.2% or $785.27 per capita yearly expenditures on food.

Decision Matrix For Potential Trade Area

To determine what size of a potential food supermarket could be supported in the New Brunswick trade area, various assumptions were made about the supermarket's capture rate in the potential primary and secondary trade areas (Table 2). Even the highest percentage capture rate estimate was purposely kept conservative in an effort to underestimate rather than overestimate. In this way, the final decision of how large a business could be supported is judged by what capture rate percentage assumptions are made.

Estimates ranged from a very conservative 14,000 square feet to a fairly conservative 46,840 square feet under various market penetration or capture rate values.

Summary and Conclusions

The potential food supermarket trade area was determined to be those areas of New Brunswick, New Jersey not included in the primary area of existing food supermarkets. A potential secondary area was the existing secondary area of food supermarkets from which a new facility could draw possible customers.

Based on census tract information, the demographics of the potential New Brunswick food supermarket area was defined in terms of population, median income and household size by both primary and secondary areas based on the above demographic characteristics and four (4) per capita weekly food expenditure estimates. All final yearly food expenditures in the potential primary and secondary trade areas of New Brunswick were based on the most conservative food expenditure estimates.

A decision matrix that related yearly food expenditures under various assumed market penetration rates was used to determine potential supportable supermarket sizes. It would appear, based on potential demand, that a food supermarket in the range of 14,000 to 46,000 square feet could be supported, depending upon which market penetration rates were assumed in the primary and secondary areas.

One is cautioned, however, that there are other economic, political, or social issues that may influence the final decision. In the final analysis, operational costs, as well as potential revenues, plus other elements of demand should be considered before a final decision is made.

It is hoped that this methodological framework could be applied for a broad range of city retail sales' operations so that potential entrepreneurs could bet a quantitative indication for the sales potential in an area without investing a great deal of time and money. If a positive indication is noted, a full-scale market and location analysis may be warranted.

Footnotes

[1]Applebaum, William, et al., Guide to Store Location Research, Addison-Wesley Publishing Co., Reading, Massachusetts, 1968.

[2]Wiewel, William and Robert Meier, "Analyzing Neighborhood Retail Opportunities: A Guide for Carrying Out a Preliminary Market Study." Planning Advisory Service Produced at American Planning Association, Chicago, Illinois, in conjunction with the Center for Urban Economic Development (UICUED), University

of Illinois. Received through the National Consumers Cooperative Bank (NCCB).

[3]Ibid.

[4]U.S. Department of Labor Statistics. "Consumer Expenditure Survey: Integrated Dairy and Interview Survey Data, 1972-73." Updated with a factor of 1.94 to reflect increase in the Consumer Price Index, 1972-1973 to 1980 (CPI estimated at 247 for 1980).

[5]See Footnote 2.

[6]See Footnote 2 (p. 10).

References

Applebaum, William, et al., Guide to Store Location Research, Addison-Wesley Publishing Co., Reading, Massachusetts, 1968.

Thatch, Daymon W. and Kelly L. Brewster, "Preliminary Market Demand Analysis For a Food Supermarket in New Brunswick, New Jersey," New Jersey Agricultural Experiment Station, Publication No. P-02010-1-83, September 1983.

U.S. Department of Commerce, Bureau of the Census, "1977 U.S. Census of Retail Trade--Geographic Area Series--United States." RC 77-A-52, Washington, DC, 1979. Adjusted by a factor of 1.36 for inflation (CPI estimated at 247 for 1980).

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APPENDIX

Total Yearly Expenditures on Food Primary Trade Area

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1. Based on Per Capita Expenditures by Retail Categories, 1980, U.S. Department of Commerce, $18.13 was spent weekly per person in grocery stores. This was $943 per year and was 20 percent of the total retail expenditures.

   $943 x population = total yearly expenditures on food.

   $943 x 19,530 = $18,416,790.

2. Based on Annual Expenditures by Family Income Before Taxes, 1980, U.S. Department of Labor, with median household income of $12,110.60 and average family size equal to 2.5 shows that 16.7 percent of the income would be spent on food at home (by interpolation).

   $12,110.60 x 16.7 = $2.022.47 spent per family per year on food at home.
   $ 2,022.47 ÷ 2.5 = $808.99 per capita per year expenditures on food
   $ 808.99 x 19,530 = $15,799,574.70 total yearly food expenditures.

3. Based on an article entitled, "Going to Market" which appeared in the newspaper USA Today, which gave the results of a survey of over 13.000 customers by the Food Marketing Institute on June 9, 1983. (This reflects 1983 prices and the fact that there are other than food products bought in the stores.)

   $24.45 x 52 - per capita yearly expenditures in food stores = $1,271.40
   $1,271.40 x 19,530 = $24,830,442.00 = total yearly food expenditures.

4. Based on a Bureau of Census 1977 Department of Commerce study, the per capita expenditures in food stores for New Jersey in 1977 was obtained through the Census Bureau in Maryland.[a]

   The value quoted was $713 for per capita yearly expenditures in food stores in New Jersey. To adjust for 1980 prices, one multiplies by the 1980 Current Price Index divided by the 1977 CPI as follows:

   $$\$713.00 \times \frac{246.8}{181.5} = \$969.52$$

   $969.52 x 19,530 = $18,934,781.55 = total yearly food expenditures

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[a] Bureau of Census, Decennial Planning, Washington, DC 20244 (301-763-1818).

NOTE: The assumption was made that incomes and per capita food expenditures would inflate at the same rate.

Total Yearly Expenditures on Food Secondary Trade Area

1. (Refer to primary trade area calculations)

   $943 x 4,636 = $4,371,748 total food expenditures in secondary trade area.

2. Based on Appendix C with median income of $13,535.5 and average family size of 2.62, the percentage spent on food would be 15.2% of income.

   $13,535.5 x 15.2% = $2,057.40 per family yearly expenditures on food.

   $2,057.40 ÷ 2.62 = $785.27 per capita yearly expenditures on food.

   $785.27 x 4,636 = $3,640,511.72 total yearly expenditures in area (secondary).

3. Using the same per capita yearly expenditure methodology as in the primary trade area (Table 3):

   $1,271.40 x 4,636 = $5,894,210.40.

4. Total yearly expenditures in food stores in 1977 adjusted by CPI to 1980 price level. Same methodology as in primary trade area (Table 3).

   $969.52 x 4,636 = $4,494,694.72 = total yearly expenditures on food in the secondary trade area.