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VALUE-ADDED WHEAT PRODUCTS: ANALYSIS OF MARKETS AND COMPETITION

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ABSTRACT

This study evaluated the U.S. domestic market for bakery products and identified market size and growth rate by product segment. The competitive structure and dynamics of the baking industry were analyzed including the geographic scope of the market, product structure, minimum efficient scale, processing consolidation, and entry/exit behavior.

Key words: bakery, consumption, industry, competitive structure.

HIGHLIGHTS

The demand for bakery products has been increasing over the past several years. The baking industry itself has been going through structural changes during the past decades. This study provides a comprehensive analysis of the bakery product market and dynamic structure of the baking industry.

Per capita consumption of most bakery products has grown steadily. However, the increase in per capita consumption is not evenly distributed among product segments. Variety breads, bagels, and frozen bakery products are among the fastest growing categories while white pan bread, cake-type doughnuts, and pies are losing their market share.

Due to perishability of products, the geographic location of processing plants is generally determined by population density. This explains why most baking plants are small size and scattered around the population centers.

The majority of baking plants operate under minimum efficient scale of production (MES). This implies that consolidations and shake-outs are expected to happen more frequently as more plants try to achieve MES in the baking industry.

A significant trend in the baking industry has been the escalation of merger and acquisition activities. Acquisition offers an opportunity for a firm to strengthen its market presence, expand geographically, and increase productivity and market accessibility.

The analysis indicates that product structure, sales size, and employment size will affect a plant's survival over time. Results also show that large size plants will have a higher survival rate.

VALUE-ADDED WHEAT PRODUCTS: ANALYSIS OF MARKETS AND COMPETITION

Jianqiang Lou and William W. Wilson*

1. INTRODUCTION

Hard red spring (HRS) wheat is a major crop in North Dakota and in the Northern Plains. In 1993, the sale of wheat comprised nearly 46 percent of cash receipts from farm marketings in North Dakota. Approximately \$1.0 billion of the receipts were from HRS wheat. Nothing is close to the importance of HRS to the agricultural sector of North Dakota. Nearly all of the HRS wheat produced in North Dakota and surrounding states is shipped to domestic and international markets as a raw commodity but only a small portion of the ultimate value of final consumer products is received by farmers in the state.

Demand and market opportunities for value-added wheat-based products have been escalating. The flour milling industry is the major processor of wheat, accounting for over 90 percent of primary domestic wheat processing use. Other major uses for wheat include breakfast food, pet food, and other feed manufacturers (Bureau of Census, *1992 Census of Manufacturers: Grain Mill Products*). The majority (89 percent) of wheat processed as flour is sold in bulk to grain-based food manufacturers. Only 11 percent is bagged and sold to ingredient distributors. The baking industry represents the primary users for wheat flour milled in the United States. According to 1992 census estimates, wholesale bakers directly use about 70 percent of all flour sold from domestic flour mills. Millers ship the remaining 30 percent to breakfast cereal producers, manufacturers of blended and prepared flours (who sell flour mixes to wholesale bakers), feed manufacturers, and a variety of other food processors and industrial concerns. The majority of products (82 percent) prepared by retail bakers are either from a mix or frozen dough. Only 18 percent prepare products from scratch (North Dakota Wheat Commission).

The purpose of this study was to analyze market opportunities and the competition structure for value-added wheat-based products, with an emphasis on products produced from spring planted wheat. Since wholesale baking is the largest user in flour consumption, our study mainly focused on the domestic wholesale baking industry. This study provided comprehensive background information and analysis of the industry with a focus on markets and opportunities.

The analysis is organized into four sections. The next section is a summary of important previous studies of the bakery market and baking industry. The third section describes the bakery product market, including product definition, product composition of wheat by type, flour consumption, bakery consumption trends by product type, and factors affecting demand. The fourth section provides a detailed analysis of the competitive structure of the baking industry regarding trend, composition, geographic distribution, product structure, efficient size, and dynamic changes of the baking industry. The report closes with a summary of major findings.

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2. PREVIOUS STUDIES

Agronomic Research defined key quality criteria for spring wheat flour in the domestic market. It found that demand is growing fast for baking purposes that traditionally use higher protein hard wheat flours or flour blends. High cost, lack of availability, and poor flour quality of high protein spring wheat forced wholesale bakers and other users to seek alternatives to spring wheat flour. The study also determines flour quality needs for different end products and for different types of baking operations.

Several studies have been devoted to the bakery market and baking industry. Harwood et al. analyzed the U.S. milling and baking industries, their structure, conduct, and performance from the early 1970s to the mid 1980s. They found the growth of demand during this period has been accompanied in the baking industries by increased output per plant, improved production and distribution efficiency, and rising acquisitions and mergers.

Packaged Facts prepared a study of the U.S. bread retail market. The report mainly focuses on the retail market for bread and bread products (packaged, perishable, and frozen) in the United States. It analyzes products delivered to stores as well as those produced on site and sold through bakeries operated by supermarket chains or independent retailers. Its conclusion was that consumers are shifting from white pan bread to higher cost variety breads. Even though there are few giant marketers in the retail bread market, none of them dominates the bread business.

Business Trend Analysts published a report on the \$28 billion market for the packaged bakery industry. The report provides a statistical analysis of the market of bread and bread-type products, cookies and crackers, pretzels, cake and cake-type products, and frozen bakery products. The report includes information on sales size and growth by bakery product type, market composition, and per capita consumption and expenditure. Factors affecting demand for bakery products include price, advertising, and demographic trends. Also discussed are the structural characteristics of the bakery products industry including operating structure, margin, value-added, labor productivity, and other aspects of the bakery market, such as leading competitors, distribution, and foreign trade.

3. PRODUCT MARKET ANALYSIS

3.1 Data Sources

Secondary data were used in this analysis. Wheat types and their baking uses were taken from the Agronomic Research study. Wheat consumption by type and flour consumption data were obtained from Economic Research Service, USDA. Bakery product consumption data and baking industry aggregate sales and shipment data were gathered from U.S. Industrial Outlook reports and Bureau of the Census' Manufacturers reports. Cahners Publishing Co. *Bakery Production and Marketing: Red Book* provided wholesale bakery plant location, employment

numbers, sales value, flour use, items produced, and other information.¹ Transportation data for bakery products were collected from Bureau of the Census' *1993 Commodity Flow Survey*, U.S. Department of Commerce. Geographic demographic data were based on the Environmental Systems Research Institute's *ArcView GIS Database*. Other sources such as Sosland Publishing Staffs' *Milling and Baking News*, Cahners Publishing Co. *Bakery Production and Marketing* were used to provide an up-to-date analysis of the dynamics of the bakery industry.

3.2 Product Categories

The U.S. Bureau of the Census data for bakery products are divided into three major categories: bread, cake, and related products, cookies and crackers, and frozen bakery products. Products within the bread, cake, and related products category are bread, rolls, soft cakes, pies, pastries, doughnuts, etc. Under the bread sub-category are white pan bread, variety breads, hearth bread, whole wheat bread, rye and the like, and other breads. The roll sub-category includes hamburger, bagels, brown-and-serve, hearth, English muffin, croissants, and other bread-type rolls. Products within the cookies and crackers category are crackers, pretzels, biscuits, cookies, wafers, ice cream cones, and related products. Frozen bakery products include most of the bakery products except bread and bread-type rolls. The breakdown and description of bakery products are listed in Table 1.

3.3 Product Composition of Wheat by Type

Hard red winter (HRW) wheat, hard red spring (HRS) wheat, soft red wheat (SRW), and white wheat are the four main types of wheat for baking use in the United States. Consumption of HRW wheat comprised 38 percent of the domestic wheat market in 1996. Consumption of HRS wheat has the second largest share of the wheat market, 24 percent in 1996. SRW and white wheat represented 21 percent and 11 percent of wheat consumption, respectively. Historical data show that both HRS wheat and white wheat consumption have an upward trend. However, the growth of HRW wheat and SRW wheat has been relatively flat (Figure 1).

Technically, different types of bakery products require different types of wheat flour. Broadly defined, there are seven different types of wheat flours used in the domestic market. HRS and HRW wheat flours are mainly used in the baking of all kinds of breads and like products such as rolls, bagels, pizza crust, frozen dough, etc. Cookies, crackers, pretzels, and cakes are products made almost exclusively from soft wheat flours. Through blending processes, the milling industry can produce different types of flour for different baking purposes such as sweet goods, pastries, and cakes (Table 2).

¹It is important to acknowledge that *Red Book* provides a point of departure for developing lists of baking firms. However, that directory is not a complete list and several firms/plants are not reported.

Table 1. Categories of U.S. Bakery Products

Category	Sub-category
All Breads	White pan bread
Variety Breads	Variety bread including hearth bread, whole wheat bread, rye and other variety breads
Other Breads	Unspecified bread
Rolls	Hamburger and hotdog, bagels, brown-and-serve, hearth rolls, English muffins, croissants, other bread-type rolls
Sweet Yeast Goods	Doughnuts and all other sweet yeast goods
Soft Cakes	Snack cakes and all other cakes
Pies	Snack pies and all other pies
Cake-type Doughnuts	
Cookies	Sandwich, marshmallow, wafers for ice cream sandwiches, and all others
Crackers	Graham, saltines, cracker sandwiches, cracker meal and crumbs, pretzels, other crackers

Source: 1992 Census of Manufactures: Bakery Products (Bureau of the Census).

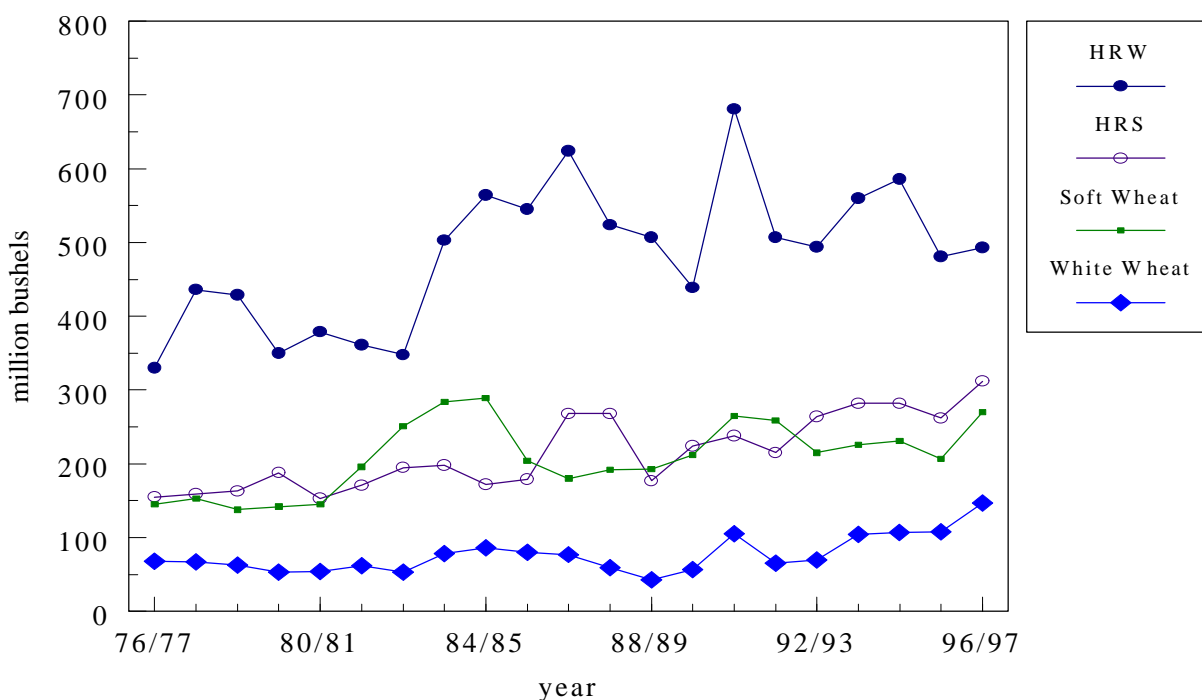


Figure 1. Domestic Consumption of Wheat by Type in the United States, 1976 - 1997

Table 2. Wheat Flour Types and Their Baking Uses in the United States

Wheat Class	Flour Type	Protein Contents	Baking Uses
HRS	High Gluten	14.5%+ (13.5% flour)	Bagels, thin pizza crust, kaiser rolls, frozen dough, English muffins, specialty breads.
HRS/HRW	Medium Gluten (Variety Bread)	13-15% (12-13.5% flour)	Ethnic breads, hearth breads, hard rolls, frozen dough, croissants, whole and cracked wheat, rye breads, whole grain breads.
HRW/HRS	Bread	11.5-13.5% (10.5-12% flour)	White pan breads, hamburger and hotdog buns, tortillas, breading flour, batter flour, deep dish pizza crust, sweet goods.
HRW/SOFT	All-purpose	10.5-12%	Cakes, biscuits, breads, pastries, pie crust, cookies.
SRW/SWW	Cracker/Pastry	9-11%	Cookies, crackers, pie crust, cereals, pretzels.
SRW/SWW	Cake	< 9%	Layer and sponge cakes.
Durum	Semolina/Durum	12-16%	Pasta and noodles.

Source: “Identifying and Defining Key Quality Criteria for Spring Wheat Flour in the Domestic Market” (Agronomic Research).

Utilization of HRS wheat flour varies based on the product produced. HRS wheat flour makes up about 1/3 of total flour usage according to a survey conducted by Agronomic Research. The bread and roll segment represents the largest HRS wheat flour users, but HRS flour only made up 29.3% of its total flour usage. Bagel, pizza crust, and frozen dough makers consume a much higher percentage of HRS flour in their total flour usage, 83, 71, and 70 percent, respectively (Table 3).

Table 3. HRS Flour Usage in Producing Bakery Products

Type of Products	Annual Total Flour Usage (million cwt.)	Annual HRS Flour Usage (million cwt.)	Percent of HRS Flour Usage (%)
All Firms in Survey	63	23	36
Bread/Roll	40	12	29
Bagels	2	2	83
Frozen Dough	5	3	70
Mixed Manufacturers	10	3	35
Pizza Crust	3	2	71
Others	4	1	18

Note: Others include sweet goods, English muffins, and starch/gluten manufacturers.

Source: Agronomic Research.

3.4 Market Size and Growth Rate

This section presents measures of market size and growth for each of the product categories. First, growth in flour consumption is shown which can be used as a summary measure of all product consumption. Then, for each of the product markets, various measures of market size and growth are derived.

3.4.1 Flour Consumption

U.S. per capita consumption of flour reached a record level in 1996, at 148 lbs. (Economic Research Service). The upward trend of flour consumption has persisted except for a few aberrations since 1981 (Figure 2). Wholesale bakers, bread, cake, cookie, and cracker bakers, account for about 51 percent of total flour use (Figure 3). Commercial mixes, prepared flours, frozen baked foods, and frozen dough ranked second, about 17 percent of total flour use. Pasta manufacturers are the third largest flour customer, accounting for about 11 percent of total flour use. In-store and retail bakers only use about 4 percent of total flour.

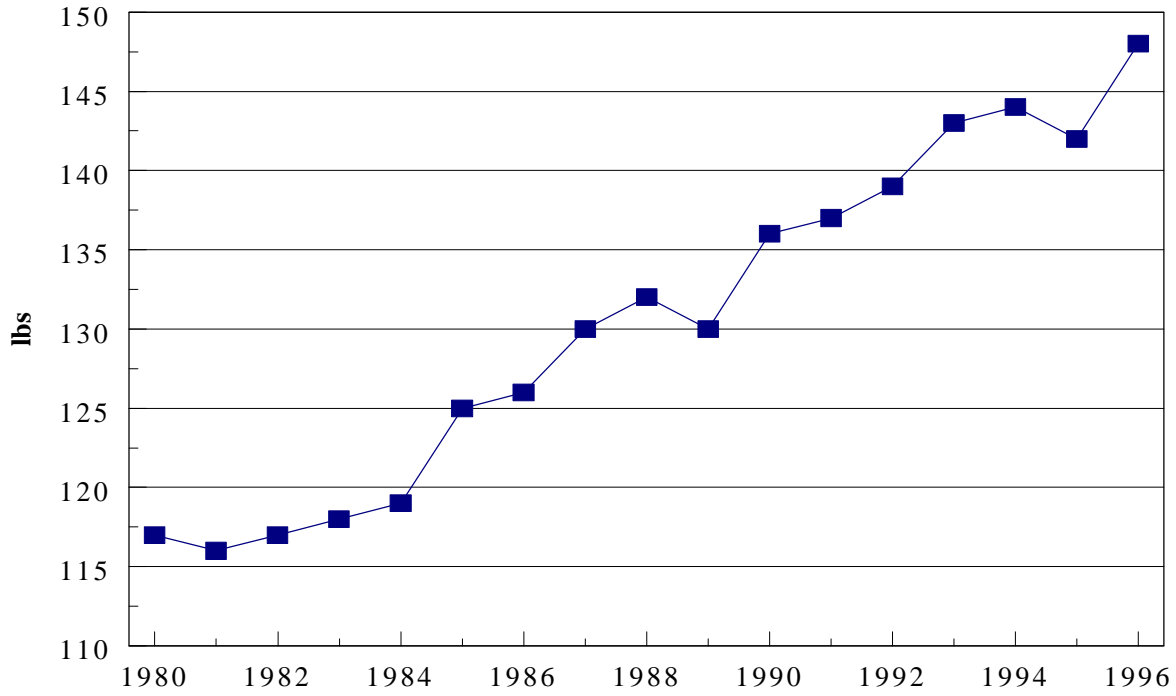


Figure 2. Per Capita Consumption in the United States, 1980 - 1996

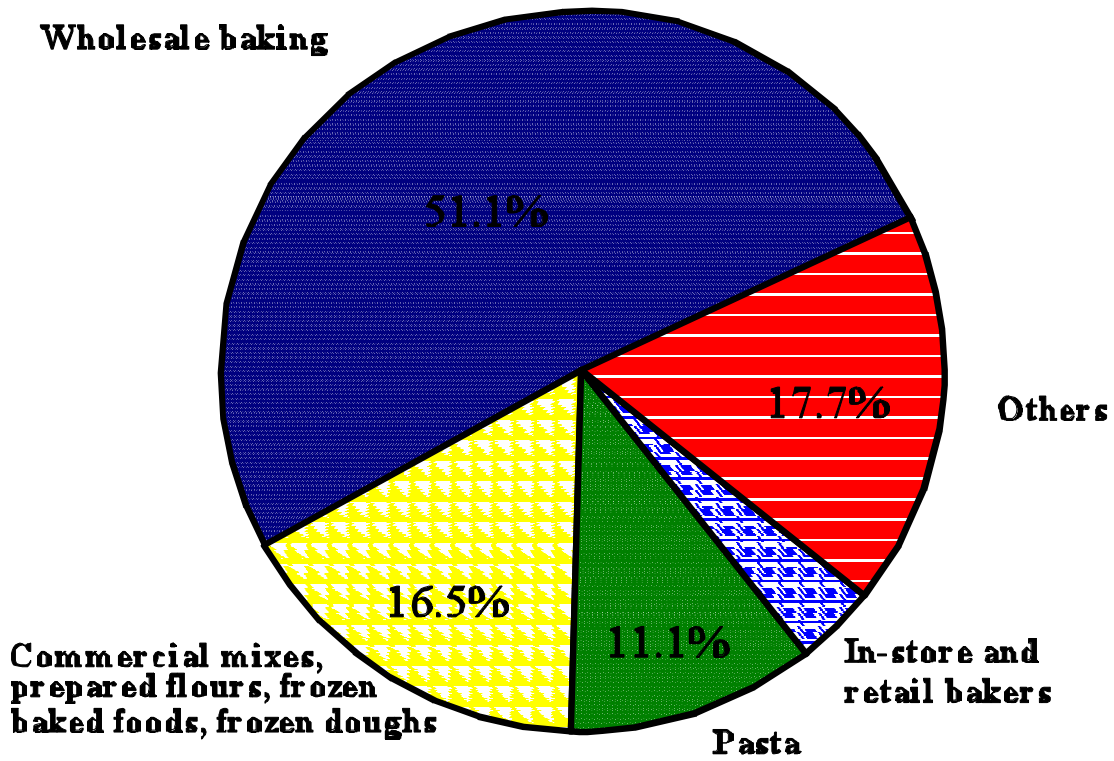


Figure 3. Consumption of Wheat Flour by Major User Group in the United States

3.4.2 Consumption of Bakery Products

All Bakery Products

From 1981 to 1986, consumption of major bakery products showed a steady decline. Per capita consumption of bakery products decreased from 92.7 to 89.6 lbs. Since then, the per capita consumption of bakery products exhibited an upward trend, increasing from 100.91 lbs. in 1987 to 109.89 lbs. in 1992. This is mainly due to lower retail prices, improved quality, more effective marketing, better packing, consumer's health concerns, and the "Food Pyramid." However, the increase in per capita consumption is not evenly distributed among the various segments of the baking industry. Consumption of most bakery products shows positive growth except for cake-type doughnuts and pies during 1987 and 1992.

Bread Products

Per capita consumption of all breads comprises the largest share of consumption of total bakery products, 46.6 percent (Figure 4). Consumption grew by 1.49 percent annually from 1987 to 1992. Consumption of bread is projected to increase 14.5 percent from 1993 to 2000 (Table 4).

The primary type of bread consumed in the United States is white pan bread. The growth of white pan bread consumption is flat, increasing only 2.4 percent during 1987 and 1992. Negative net percent shift indicates the growth of consumption of white pan bread is much slower than the average growth of consumption of all breads. But it still remains the largest segment of the bread market, representing 55 percent of total bread consumption (Figure 5).²

Using a different baking process, hearth bread has a formation of solid, crisp, flavorful crust and other attributes that appeal to consumer desires. Hearth bread consumption, which represents 13.4 percent of the total bread market, is showing strong growth, a 21.5 percent increase during 1987 and 1992. Net percent shift indicates that it has captured 57 percent of the variability in average bread consumption growth.

Per capita consumption of whole wheat bread, representing 19.55 percent of the bread market, increased by 7.1 percent from 1987 to 1992. Negative net percent shift indicates it grew slower than the average growth of the bread category.

²The net percent shift is an alternative measure for ranking growth. This measure estimates the percent of deviations from the average growth rate captured by each category. It provides perspective on the rate of growth for each product category in relation to the market as a whole and provides a more appropriate method of ranking growth among products. For a more in-depth discussion of shift-share analysis, see Huff and Sherr.

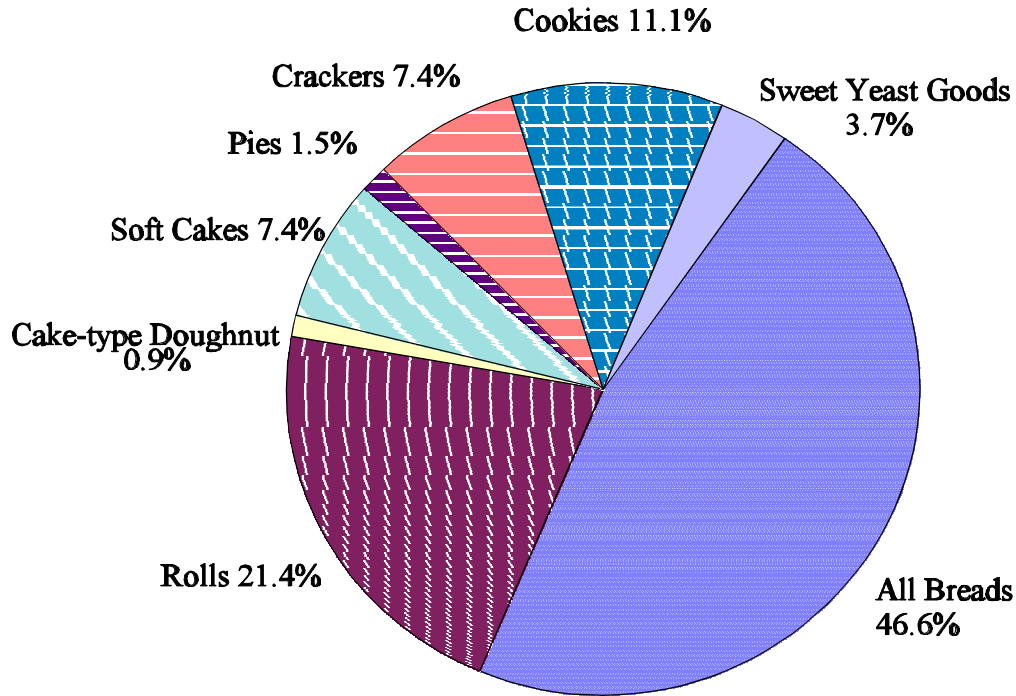


Figure 4. Composition of Per Capita Consumption of Bakery Products in the United States, 1992

Rye bread consumption mainly depends on local ethnic preference. Consumption of rye and like bread, representing only 4.3 percent of the bread market, increased by 11.2 percent during 1987 to 1992. It captured 5.5 percent of the variation average growth of bread consumption.

Consumption of all other variety breads, 7.3 percent of the bread market, has shown a strong growth rate, increasing 24.7 percent from 1987 to 1992. Net percent shift indicates that it captured 37.3 percent of the variation of the average bread consumption growth.

Roll Products

Consumption of rolls and sweet goods is among the fastest growing categories, with annual growth rates of 1.66 and 1.69 percent, respectively. These products made up 21.4 and 3.7 percent of the total consumption. From 1993 to 2000, consumption of rolls and sweet goods is projected to increase 9.6 and 16.8 percent, respectively (Faridi and Faubion).

Table 4. Projected Per Capita Consumption of Bakery Products in the United States, 1993 - 2000

Product	1993	1994	1995	1996	1997	1998	1999	2000
	----- lbs. -----							
All Breads	52.01	52.85	53.78	54.83	55.88	56.96	58.20	59.54
Rolls	23.91	24.33	24.70	25.08	25.35	25.63	25.91	26.20
Sweet Yeast Goods	4.11	4.28	4.39	4.50	4.58	4.65	4.73	4.80
Soft Cakes	8.34	8.55	8.72	8.89	9.02	9.17	9.32	9.49
Pies	1.64	1.64	1.64	1.63	1.63	1.63	1.63	1.63
Cake-type	0.92	0.86	0.82	0.80	0.80	0.79	0.79	0.78
Cookies	12.29	12.56	12.88	13.16	13.37	13.53	13.69	13.85
Crackers	8.23	8.39	8.61	8.85	9.01	8.31	7.58	6.85

Source: *Wheat End Uses Around the World* (Faridi and Faubion).

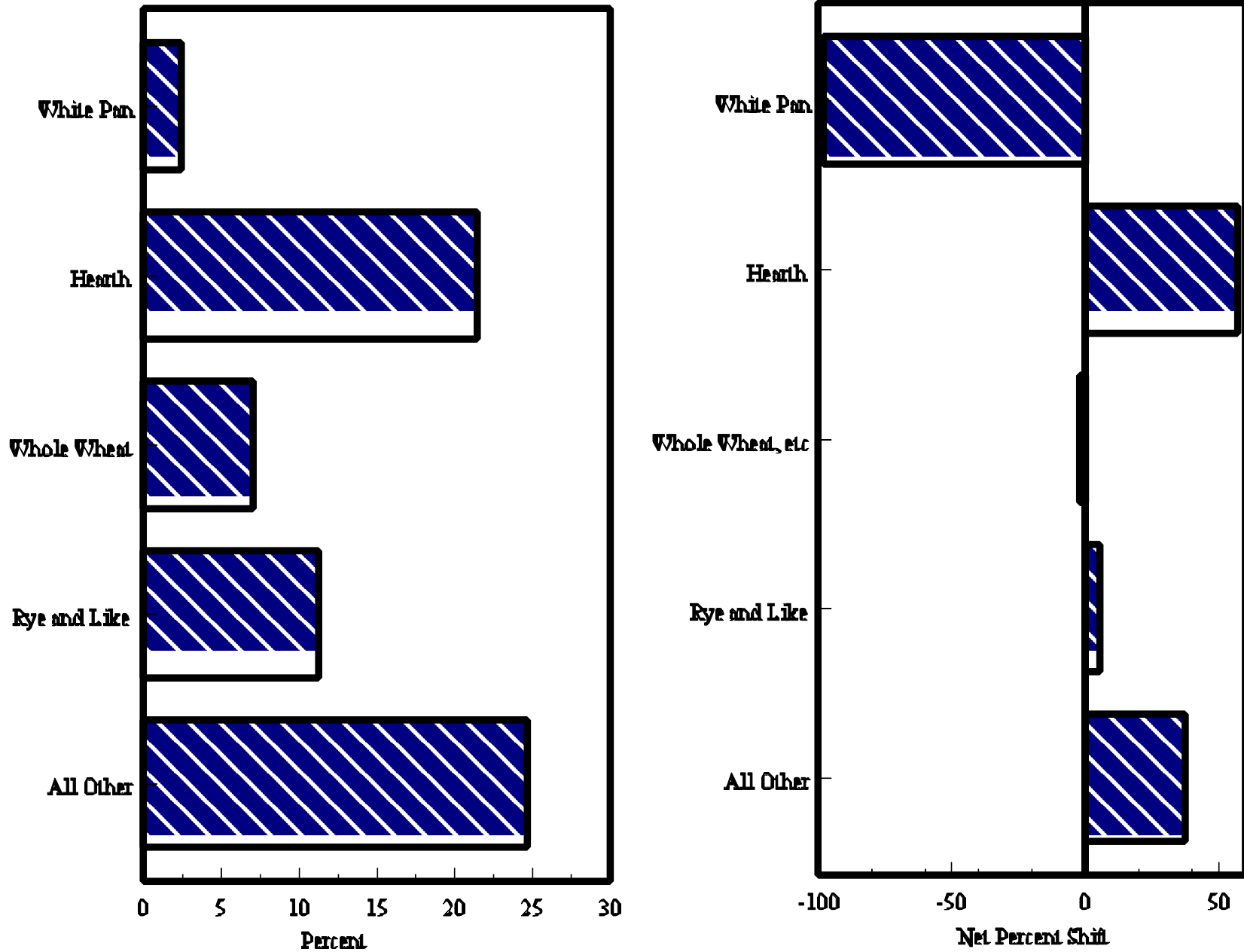


Figure 5. Percent Change and Percent Net Shift of Per Capita Consumption of Bread Products

Hamburger and hotdog consumption represent 57.1 percent of the roll market. But the growth is relatively low, increasing only 4.6 percent during 1987 to 1992. Negative net percent shift indicates the growth of consumption is slower than the average growth of consumption of all roll products (Figure 6).

Bagels, once considered a specialty ethnic food, are a low-fat, boiled or steamed bread. Bagel products, which originally have been popular for decades in the Northeastern region, rapidly spread across the nation and even into the offshore market. Because bagels were in the early stage of the product life cycle, the market was increasing simply through product awareness. Bagel consumption, which represents 14.2 percent of the total bread market, has shown remarkable growth rate, a 55.6 percent increase during 1987 to 1992. Net percent shift indicates that bagels captured 61.7 percent of the variability in average growth of roll consumption.

Per capita consumption of brown and serve and hearth rolls, representing 11.8 percent of the roll market, increased by 4.6 and 6.9 percent from 1987 to 1992, respectively. Negative net percent shift indicates they grew slower than the average growth of the roll category.

Consumption of the English muffin, representing 7 percent of the roll market, decreased by 4.1 percent during 1987 to 1992. Consumption of croissants, representing only 2.3 percent of the roll market, has shown a fast growth rate, a 51.4 percent increase from 1987 to 1992. Net percent shift indicates that it captured 9.1 percent of the variation of the average roll consumption growth. Consumption of other type rolls, representing 7.7 percent of the roll market, has also shown solid growth, a 48.4 rise between 1987 and 1992.

Other Bakery Products

Per capita consumption of soft cakes and cookies is also showing strong growth with annual growth rates of 1.8 and 1.6 percent from 1987 to 1992, respectively. Per capita consumption is projected to increase 13.8 and 12.7 percent from 1993 to 2000, respectively (Faridi and Faubion). Net percent shift of soft cakes and cookies is 36.6 and 15.9, respectively. It indicates that soft cakes and cookies capture a large percent of the variability in average growth of bakery product consumption.

Per capita consumption of crackers grew 3.7 percent annually during 1987 to 1992. However, negative net percent shift indicates it grew slower than the average growth of all bakery products (Figure 7).

Per capita consumption of the pies and cake-type donuts categories has a downward trend. Consumption decreased by 32.6 and 5.1 percent during 1987 to 1992. The decreasing trend is projected to continue from 1993 to 2000.

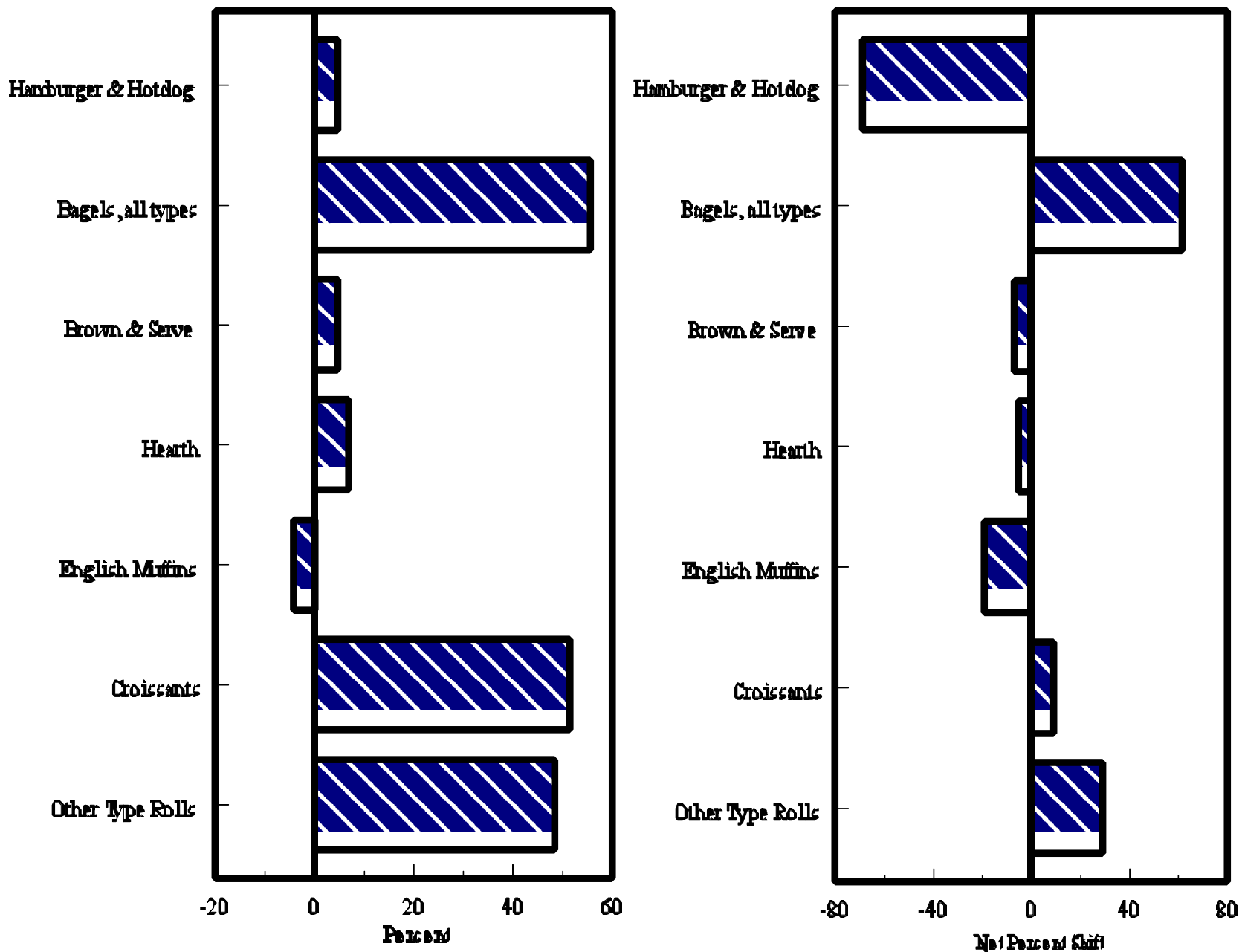


Figure 6. Percent Change and Percent Net Shift of Per Capita Consumption of Roll Products

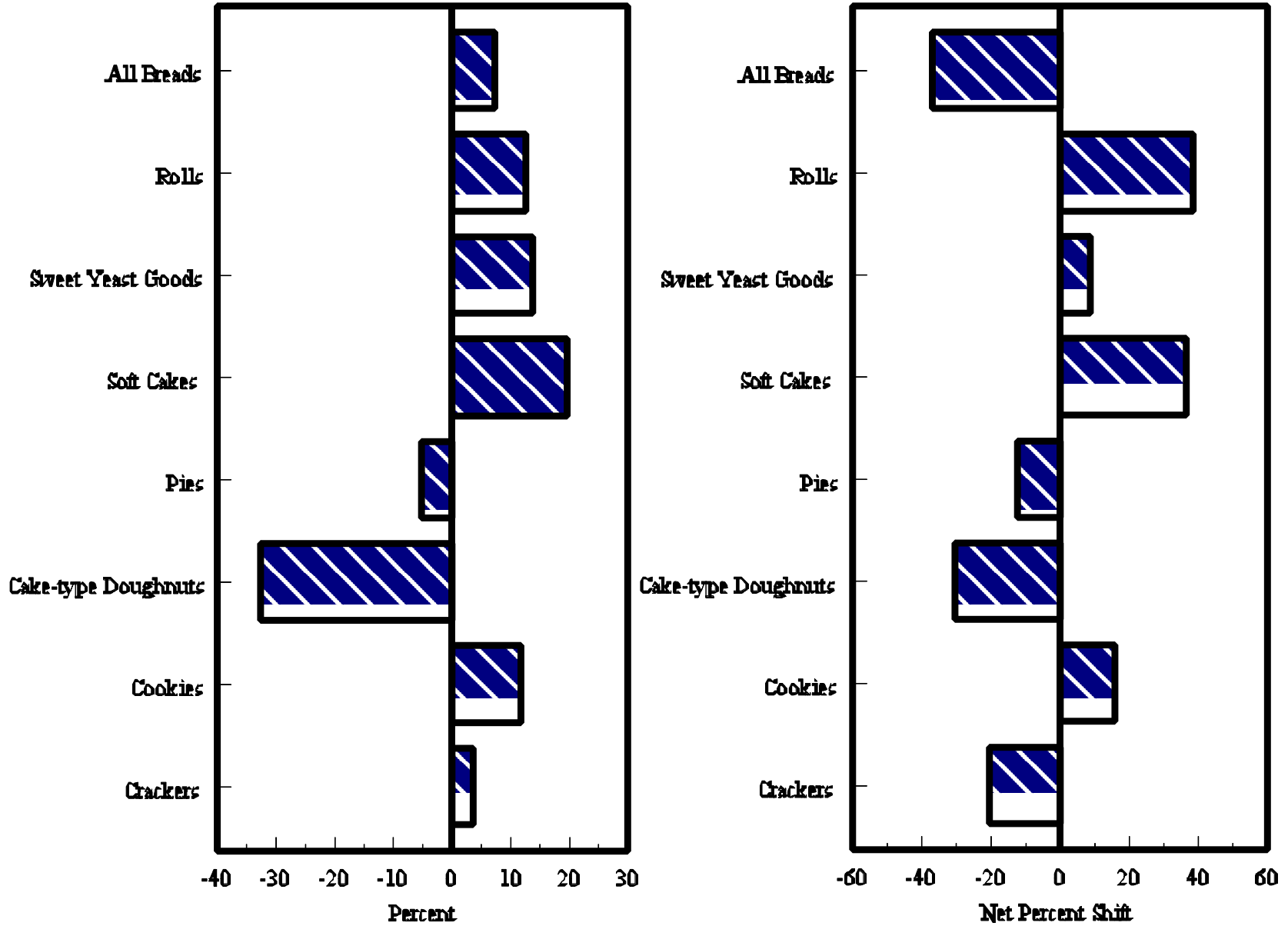


Figure 7. Percent Change and Net Percent Shift of Per Capita Consumption of Bakery Products

3.5 Factors Affecting Consumers' Behavior and Demand

A number of factors have contributed to the growth and composition of consumption in this market. These are described here briefly.

3.5.1 Children

Children represent one of today's hottest targets for baked goods marketers. More and more dual-income and single-parent households have boosted children's role in family food purchasing decisions. They influence nearly \$100 billion in food and beverage purchases annually, with this amount growing at a rate of 17 percent to 20 percent annually (*Milling and Baking News*). Research also indicates that children have "a lot of influence" on their parents on which brand to purchase, and they are more brand savvy and market-aware (*Milling and Baking News*).

3.5.2 Convenience

There has been an increase in demand for convenience foods. More and more Americans are eating when and where they can, refusing to be structured by the "three meals a day" dictum.

3.5.3 Diet and Health

Diet and health are strong concerns among consumers. The Food Guide Pyramid, developed by the U.S. Department of Agriculture, helps people choose what and how much to eat from each food group. It also advises all Americans two years and older to rely on bread, cereal, rice, and pasta, as well as fruits and vegetables, for most of our food choices to maintain health. The pyramid's message has had a positive influence on consumer perception of grain-based food products. According to some research, the message has not reached its goal of enticing people to eat 6-11 servings of cereal and grain products daily. Therefore, there is room for the consumption of an additional 100 lbs. of cereal-based wheat products per person per year to meet the pyramid recommendations.

An increasing percentage of Americans are concerned about reducing the intake of calories and fat. Many grain-based foods are either naturally lower in fat and/or calories. Low-fat eating is the No. 1 nutrition concern among the consumers, and low cholesterol and low sodium choices are also sought.

3.5.4 Ethnic Market

Many grain-based companies are targeting the fast-growing and financially lucrative ethnic market. The growing numbers of ethnic consumers make them an attractive market. In 1995, the U.S. Census Bureau estimated that one in every four Americans was non-white. By 2050, that proportion will be about one in two. The important demographic changes in Hispanic and Asian American populations will have implications for food manufacturers in labeling as well as in supermarket product offerings.

3.6 International Trade in Value-added Wheat Products

There has been substantial growth in trade in value-added wheat products.³ Market characteristics were described by import market size, import market growth, and net shift share analysis of the import market. The quantity of imports, measured in metric tons, was used as the measure of market size and calculated from 1995 data. Market growth was calculated from 1992 to 1995.

Among the four commodity groups, macaroni was the fastest growing import commodity. Macaroni imports grew 52 percent worldwide from 1992 to 1995. Bread/biscuits imports grew 14 percent, pastry imports grew 8 percent, in contrast to cereal imports which grew 7 percent. Within the four commodity groups, the largest import markets were the United States, Germany, France, and Monaco. France was the largest cereal importer with a 17 percent world import market share. The largest macaroni importer was the United States with a 19 percent world import market share. The United States was also the largest bread/biscuits importer with a 16 percent world import market share. France had a world import market share of 19 percent for pastry imports.

The fastest growing import markets comprised only a small percentage of total world imports. The quantity of cereal imports grew the highest in percentage terms in Uruguay, Colombia, Ecuador, Guatemala, and Tunisia. These five countries had only a 1 percent share of total world imports of cereal. The countries with the highest percentage increase in macaroni imports (Chile, Zimbabwe, Egypt, Peru, and Argentina) had a 2 percent market share of total world imports. Bread/biscuit imports had the highest percentages of growth in Honduras, Zimbabwe, Panama, Uruguay, and Guatemala. The combined world import market share of bread/biscuits for these five countries was 1 percent. The situation was similar with world pastry imports. Tunisia, Thailand, the Philippines, the Korean Republic, and Chile had the largest percentage import growth for pastry from 1992 to 1995. They had a combined pastry world import market share of 1 percent.

Among cereal importing countries, Germany had the greatest net import percent shift at 13 percent.⁴ The United States had the lowest net import percent shift of -20 percent. The situation was reversed for the United States in the macaroni import market. The United States had the largest net import percent shift of macaroni at 19 percent. In the bread/biscuits import market the United States also had the largest net import percent shift. The United States had a net import percent shift of bread/biscuits of 19 percent. In the pastry market, the United States had the largest net import percent shift, with a net import percent shift of 32 percent.

³This section is a brief summary of a forthcoming report on trade in value-added wheat products (Onnen and Wilson). Secondary data were used in the analysis. Export and import values and quantities between countries from 1962 to 1995 were collected from UN Comtrade data. Data were collected for SITC 04812 (breakfast cereals), SITC 0483 (macaroni), SITC 04841 (bread/biscuits), and SITC 04842 (pastries) commodity groups. The data were reported for over 220 countries.

⁴Shift share analysis was used to compare the distribution of import quantities for each commodity from 1992 to 1995. This distribution was measured by the net import percent shift in each country.

The United States was one of the largest exporting countries for each commodity. It ranked third for cereal exports to the world, behind the United Kingdom and Germany. Among countries that export macaroni, the United States ranked sixth. Italy, with a 53 percent export market share, was the largest macaroni exporter. The United States ranked second for exports to the world of bread/biscuits. The United States had an export market share of 12 percent, which was less than Germany's share of 15 percent. The United States ranked eighth for exports of pastries to the world, with a 5 percent export market share. Belgium-Luxembourg was ranked first with a 15 percent export market share.

While the United States is among the countries with the largest export quantities in 1995 for each commodity, it ranked among the lowest five in export shift share analysis. The net percent export shift in the cereal market was -32 percent for the United States, which ranked it last among all world exporters. The United Kingdom had the largest net percent export shift in the cereal market at 12 percent. In the macaroni market, the United States had a net percent export shift of -2 percent, which placed it 45th of the 49 countries which reported exports of macaroni. China had the largest export market shift of 48 percent. Italy, the country with the largest export market share in 1995, had the lowest net percent export shift at -79 percent. Similar results occurred in bread/biscuits exports. While Germany had the largest export market share in 1995, it had the lowest net export market shift at -37.1 percent. The United States had a net export market shift of -9 percent, which placed the United States as the 48th of the 51 countries reporting exports of bread/biscuits. Italy had the largest net export market shift at 17 percent. Within the pastry market, Turkey had the largest net export shift of 37.4 percent. The United States was ranked 47th of the 50 reporting countries. The United States had a net export shift of -21 percent. Belgium-Luxembourg, the country with the greatest export market share of pastries, had a net export market shift of -.6 percent, which placed its rank at 38th.

4. STRUCTURE OF COMPETITION

4.1 Trends in the Baking Industry

Census data for the wholesale bakery industry are published by the U.S. Department of Commerce every five years. It is widely regarded as the most authoritative and complete assessment of the state of the industry. The census reports classify the bakery industry into three categories: bread, cake, and related products industry (SIC 2051); cookies and crackers industry (SIC 2052); and frozen bakery products industry (SIC 2053).

4.1.1 Bread, Cake, and Related Products (SIC 2051)

Manufacturers classified in industry 2051 are made up of establishments primarily manufacturing fresh or frozen bread and bread-type rolls and fresh cakes, pies, pastries, and other similar “perishable” bakery products.

The bread and cake sector continues to be the largest section in the bakery industry, about 60 percent of total value of the bakery industry shipments. According to the newly released census data for the bakery industry, total shipment value of the bread, cake, and related products industry in 1995 was \$19.6 billion, an 8.3 percent increase from \$18.1 billion in 1992. Value added by the manufacturer in the bread, cake, and related products industry in 1995 was \$ 12.4 billion, an 8 percent increase from \$11.5 billion in 1992. Capital expenditure for plant and equipment was \$534.8 million in 1995, a 4 percent growth from 1992. Compared with other sections, the growth of this section is relatively flat and has not shown much growth for several years (Table 5). However, some companies are still exploring the market by introducing new varieties and tastes. For example, variety breads and bread-type rolls are taking the market share away from white pan bread.

4.1.2 Cookies and Crackers (SIC 2052)

Manufacturers classified in industry 2052 are made up of establishments primarily manufacturing fresh cookies, crackers, pretzels, and similar “dry” bakery products.

The total shipment value of the cookies and crackers sector in 1995 was \$10,500 million, a 21.1 percent increase from \$8,668.4 million in 1992. Value added by the manufacturer in the cookies and crackers sector in 1995 was \$6,609.8 million, a 19.7 percent increase from \$ 5,523.4 million in 1992. Many manufacturers are opening new plants or expanding capacity and buying new equipment to meet the growing demand. The capital investment was used to increase production capacity, add new product lines, and improve production efficiency. Capital expenditures for plant and equipment were \$457.6 million in 1995, a 47.5 percent growth from 1992. This sector grew faster than did the bread and cake sector.

4.1.3 Frozen Bakery Products (SIC 2053)

Manufacturers classified in industry 2053 are made up of establishments primarily manufacturing frozen bakery products, except bread and bread-type rolls.

The market for frozen baked food in the past few years has shown a very strong growth rate. The total shipment value of the frozen baked products industry increased by 44 percent between 1992 and 1995, at about \$2,445 million in 1995. Value added by the manufacturer in this sector in 1995 was \$1,323 million, a 44 percent growth from 1992. The frozen market has become large enough to induce expansion in this sector. Growth of capital expenditures in this sector has paralleled growth of industry shipment value. Capital expenditures for plants and equipment were \$94 million, a 153 percent increase from 1992.

Table 5. Economic Indicators for the U.S. Bakery Industry 1992 - 1995

Indicators	Product	1992	1993	1994	1995	% Change 1992-95
----- million \$ -----						
Value of Industry Shipment	Bread and Cake	18,130	18,658	19,285	19,640	8.3
	Cookie and Cracker	8,668	9,442	10,094	10,500	21.1
	Frozen Bakery Products	1,696	1,810	2,049	2,445	44.2
Value Added by Manufacturer	Bread and Cake	11,462	11,678	12,143	12,381	8.0
	Cookie and Cracker	5,523	6,045	6,630	6,610	19.7
	Frozen Bakery Products	919	1,007	1,132	1,323	43.9
Capital Expenditures for Plant and Equipment	Bread and Cake	514	511	590	535	4.0
	Cookie and Cracker	310	314	385	458	47.5
	Frozen Bakery Products	37	39	61	94	152.6

Source: 1993, 1994, 1995 Annual Survey of Manufactures (Bureau of the Census).

4.2 Composition of the Baking Industry

The baking industry is made up of four different segments: wholesale bakers, retail bakers, in-store bakers, and food services.

4.2.1 Wholesale Bakers

Wholesale bakers manufacture full-baked products and deliver most of them to independent grocery stores and to the individual outlets of some chain grocery stores for retail sale. A small share of their output may be sold to restaurants and other institutions. Wholesale fully baked products are usually for general consumption.

Wholesale bakers continue to be the backbone of the baking industry. This segment generated 59 percent of all bakery sales in 1995 (Table 6). Nabisco Biscuit Co., Interstate Brands Corp., CPC Baking Business, and The Earthgrains Co. are the top four wholesale bakers in the United States.

Table 6. Bakery Sales by Segment in the United States, 1991-1995

	1991	1992	1993	1994	1995
	----- billion \$ -----				
Wholesale Bakers	29.1	30.4	30.7	31.5	32.4
Retail Bakers	7.1	7.5	5.5	5.9	6.0
Food Services	8.8	8.7	8.0	7.5	7.5
In-store Bakers	8.1	8.6	8.7	9.1	9.4

Source: *Bakery Production and Marketing* (Cahners Publishing Co.).

4.2.2 Retail Bakers

The U.S. Department of Commerce defines retail bakers as businesses in which bakery foods, baked either in whole or in part on the premises, are sold over the counter directly to customers. This definition includes traditional full-line retail bakeries, as well as

specialty bakeries, donut shops, and franchise outlets. Retail bakers take a small share of the total baking industry sales, about 11 percent.

Generally speaking, retail bakers lack resources and capabilities of branded products in areas such as research and development, consumer research, and trend analysis. In other words, it is hard for them to come up with innovative products to compete with name brands in quality and production efficiency.

4.2.3 Food Services

The food service segment includes full-service restaurants and hotel eateries, fast-food outlets, take-out and delivery joints, and company and school cafeterias. It comprised about 14 percent of total bakery sales in 1995. While the food service industry is increasingly complex in structure, quick-service and full-service restaurants still account for 60 percent of all sales. This suggests opportunities for wholesale bakers as suppliers to these businesses.

4.2.4 In-store Bakers

In-store bakers are located at the distribution center (a supermarket), which purchases frozen dough from a wholesale plant and bakes products at the supermarket. The process of bake-off includes defrosting dough, proofing, and baking. This segment contributes about 17 percent to total bakery sales. The top four in-store bakery companies are Winn-Dixie Stores, Inc., The Kroger Co., Safeway Stores, Inc., and The Great A & P Tea Co., Inc.

Increasingly, consumer craving for freshness and convenience dominate their decision on purchasing bakery products. That is good news for the in-store bakery, because its product is perceived as being fresher and of higher quality. In fact, more and more super stores are featuring displays of freshly made baked goods. The emphasis on in-store bakeries is steadily shifting toward thaw-and-sell and frozen bake-off items that require less preparation and baking time while simultaneously improving quality control and profit margins.

4.3 Competitive Structure and Major Players by Segment

4.3.1 Bread and Roll Segment

The United States has more than a thousand large and small bread and roll manufacturers. It comprises the largest segment of the bakery market. This is a market with intense competition and is considered to be somewhat over capacity. The industry is considered mature, and consolidation and shake-out will likely become important. The top four firms are estimated to account for about 60 percent of total market share (Table 7). Interstate Brands Corporation, based at Kansas City, became the nation's largest wholesale baker of bread and rolls in mid-1995 with the \$520 million acquisition of Continental Baking Co. from Ralston Purina Co. It operates nationwide, and the annual sales in 1995 were estimated to be about \$3 billion. CPC Baking Business, based at Bay Shore, NY, is second in bread and roll products marketing, with about \$1.7 billion in total annual sales in 1995. It was created by the purchase of most of the baking

operations of Kraft Foods, Inc. for \$865 million in 1994. The Earthgrains Co. spun off by Anheuser-Busch to shareholders in 1994, is third in bread and roll products marketing with total annual sales of \$1.5 billion in 1995. Its marketing area covers most of the nation except the Northeast region. The fourth largest bread and roll marketer is Flowers Industries, Inc. Its market area is concentrated in the Southeast region.

Table 7. Competitive Structure by Product Segment in the United States, 1995

Product	Market Size (%)	Growth 1992-95 (%)	4-Firm Market Share (%)	Number of Plants
All Bakery Products	--	15	31	2,714
Breads and Rolls	38.76	10	60	1,599
Cookies and Crackers	28.72	19	68	927
Frozen Dough	10.66	27	24	331

Sources: *Annual Survey of Manufacturers* (Bureau of the Census), *Bakery Production and Marketing: Red Book* (Cahners Publishing Co.), *Milling and Baking News* (Sosland Publishing Staffs), various issues.

4.3.2 Cookie and Cracker Segment

The number of cookie and cracker manufacturers in the United States is less than the bread and roll manufacturers. The growth of the market was about 20 percent between 1992 and 1995. Similar to the bread and roll segment, this is also a mature market with fierce competition. The large portion of market growth is from the introduction of low-fat and fat-free products. This is the market with an even higher concentration than the bread and roll segment. In the top four firms, market share is estimated at about 68 percent of the total segment. Nabisco Biscuit Co. is the leader in this segment with \$3.5 billion total sales in 1995. Its marketing area is nationwide. Keebler Co. is second with \$1.5 billion total sales in 1995. Its products are also distributed nationwide. Sunshine Biscuits Inc. ranked third in the cookie and cracker market with \$580 million annual total sales in 1995, far behind the top two leaders. Lance Inc. is fourth with \$460 million sales in 1995. Its marketing area is mainly focused in the Southeast, Midwest, West, and Southwest regions.

4.3.3 Frozen Dough Product Segment

Frozen dough is the third largest segment in the baking industry. It is the fastest growing segment among all bakery segments, with 27 percent growth between 1992 and 1995. There are few major companies in this market, and none of them has dominated this segment. The top four firms only control 24 percent of the market share. This is a market with less entry resistance

compared with other segments. Many firms are entering this attractive market. Rich Products Corp., Country Home Bakery, Inc., and Hazelwood Farms Bakeries are considered to be at the top with \$1.8, \$1.5, and \$.7 billion total sales in 1995, respectively. All of them have been in the frozen bakery business for over 20 years. Another major firm is Heinz Bakery Products. It entered the market through a series of nine acquisitions in both the United States and Canada between 1988 and 1991. Pillsbury is also a major firm. It focuses its non-brand food business on both frozen dough and mixes.

4.4 Geographic Market for Bakery Products

4.4.1 Geographic Scope of Market

The geographic scope of the market is an important element of industry structure. The most straightforward measurement of the geographic scope of the market for bakery plants would be the distance a product could be shipped.

According to the *1993 Commodity Flow Survey Report* (Bureau of the Census, U.S. Department of Commerce),⁵ average shipment distance for all bakery products is 74 miles (Table 8). About 98 percent of bakery products are shipped in single transport modes, such as private truck, for-hire truck, rail, and postal service. Only 2 percent of bakery products are shipped through multiple modes or other modes. Most shipments of bakery products (70 percent) are made with private truck fleets, which are operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment. The shipment of bakery products by the private truck has an average market radius of 49 miles. For-hire truck fleets, which carry freight on a fee-collection basis, ship about 28 percent of bakery products. With a 295-mile average distance per shipment, for-hire truck fleets cover a market area five times larger than private truck fleets. The shipments of bakery products through other transport modes are less than 2 percent.

Considering the shipping distance of bakery products, the baking industry is a local industry instead of highly concentrated like the milling industry. The majority of bakery products must be delivered immediately after they are produced. The industry mainly relies on truck fleets for product shipment. However, the scope for centralizing production of bakery products could be expanded with the advent of industrially produced frozen dough and technology of baking.

⁵The Commodity Transport Survey, conducted by the U.S. Department of Commerce, is regarded as the most authoritative assessment of the shipping distance of commodities. In 1993, approximately 200,000 establishments were selected from a universe of 800,000 establishments engaged in mining, manufacturing, wholesale, and selected retail and service activities, as well as auxiliaries of multi-establishment companies. Establishments were selected from the 1992 Standard Statistical Establishment List (SSEL) of business establishments with paid employees. The establishments in the survey were stratified by three-digit Standard Industrial Classifications (SIC). Bakery products were classified as SIC 205.

4.4.2 Geographic Distribution of Bakery Plants

Since most bakery products are perishable and have a shorter shelf life, the economies of plant dispersion runs surpass the advantage of the economies of large-scale production. Shipping costs of bakery products and potential deteriorating of quality outweigh the benefit generated by having large-scale production. Therefore, multi-plants at different geographic locations are a common strategy for large baking firms in the United States. Distribution of U.S. bakery plants is highly related to distribution of population and bakery retail outlets (Figure 8). This explains why bakery plants are either located in metropolitan areas or close to them.

Table 8. Average Shipping Distance and Modes of Transportation for Bakery Products in the United States, 1993

Mode of Transportation	Value		Tons		Ton-miles		Average Miles Per Shipment
	Number (million \$)	Percent	Number (thousands)	Percent	Number (millions)	Percent	
Total	48,049	100.0	28,767	100.0	8,153	100.0	74
Single Modes:	46,991	97.8	28,242	98.2	7,544	92.5	--
Parcel, postal service, or courier	71	0.1	11	—	7	0.1	880
Private truck	33,375	69.5	19,998	69.5	2,876	35.3	49
For-hire truck	13,358	27.8	8,140	28.3	4,496	55.1	295
Air	--	—	—	—	—	—	(S)
Rail	187	0.4	93	0.3	165	2.0	1,551
Multiple Modes:	675	1.4	273	0.9	445	5.9	--
Private truck and for-hire truck	19	—	(S)	—	4	—	276
Truck and air	(S)	—	(S)	--	(S)	--	(S)
Truck and rail	623	1.3	260	0.9	434	5.3	1,658
Truck and water	25	0.1	9	—	(S)	0.5	(S)
Inland water and deep sea	8	—	4	—	7	0.1	1,524
Other Modes	381	0.8	237	0.8	120	1.5	184

Source: 1993 Commodity Flow Survey (Bureau of the Census, U.S. Department of Commerce).

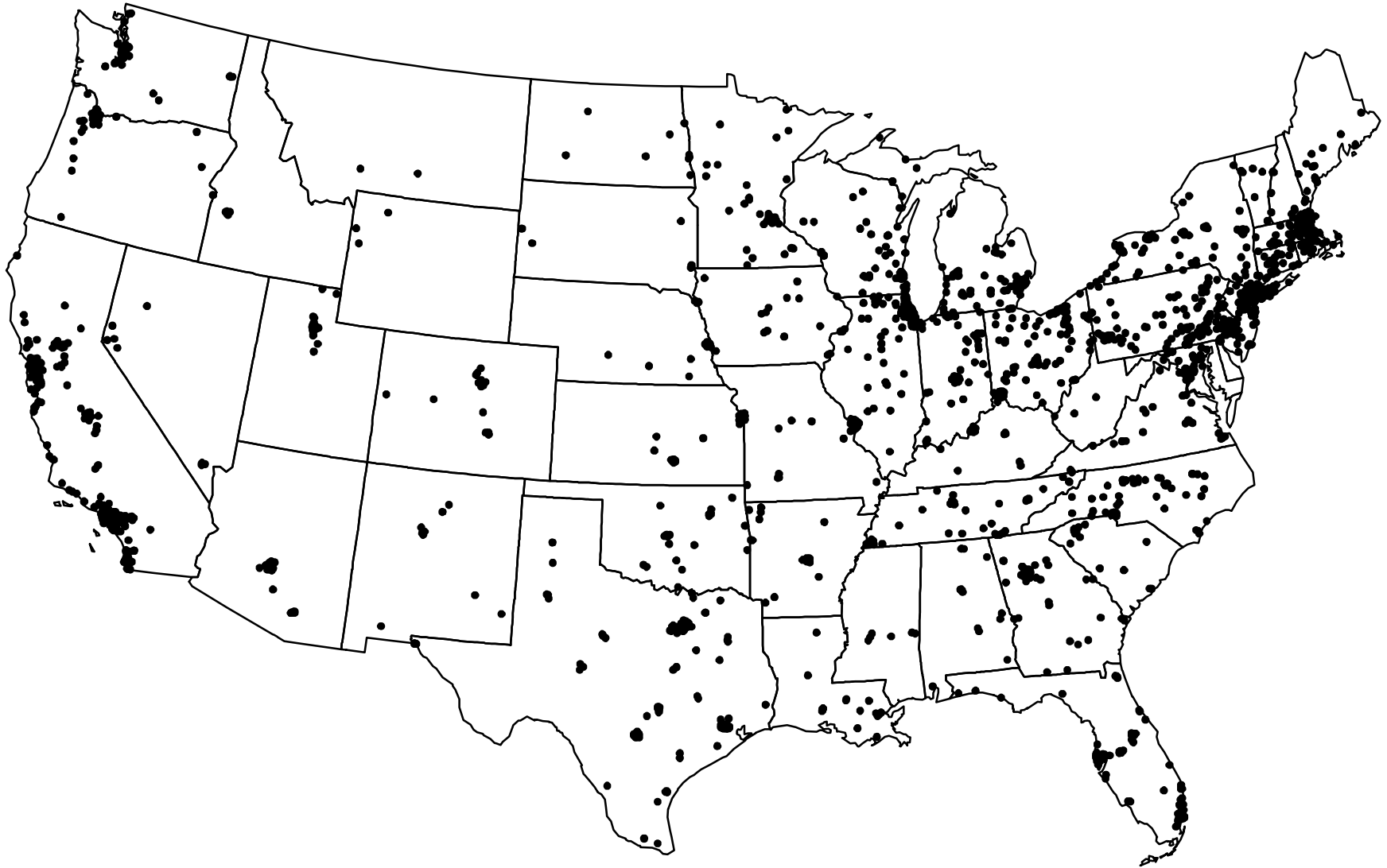


Figure 8. Geographic Distribution of Bakery Plants in the United States, 1996

About 2,500 U.S. bakery plants are scattered across the 50 states. The majority is located on the East and West Coasts, and the Midwest where population density is high. California is the leading state with 314 bakery plants, followed by New York with 217 bakery plants, and Pennsylvania with 180 bakery plants. States like Illinois, New Jersey, Ohio, and Texas also have a high percentage of bakery plants. Few plants were observed in the low population density states such as Montana, Wyoming, and Idaho (Table 9).

4.5 Product Composition of Bakery Plants

As discussed in Section 4.4.1, the geographic scope of the bakery market for a bakery firm is limited. To increase market share, bakery firms either have to ship to different geographic markets to capture more market area or have to increase the sales at local markets. Another option is to diversify its product line. Since the manufacturing technology is similar across different products, it is possible for plants to produce multi-products to the local market.

In the United States, more than 73 percent of bakery plants produce more than two product categories. About 79 percent of the plants produced one to four products in 1979. This percentage has been declining over the years, 68 percent in 1990 to 65 percent in 1996. Bakery plants producing 9 to 12 products have increased from 1 percent in 1979 to 10 percent in 1990 and 12 percent in 1996. About 4 percent of bakery plants produce 13 to 16 products from a single plant (Table 10).

4.6 Size of Bakery Plants and Minimum Efficient Scale

4.6.1 Size of Bakery Plants

Since the manufacturing technology of bakery products is similar, the common size of bakery plants has sales ranging from 1 to 5 million lbs., weekly flour usage ranging from 0 to 50,000 lbs. per week, and employees ranging from 20 to 50. This size is common for plants producing breads, bagels, frozen dough, croissants, sweet goods, donuts, cakes, and cookies. However, the statistics also show that plants producing buns, rolls, pizza crusts, and crackers tend to be larger in sales, flour use, and employment (Table 11).

The baking industry is considered fragmented. This is even more obvious at the start-up level of an organization. Many are not well-capitalized and do not have the professional staff to put together a company that is able to withstand the competitive forces in the market. The average size of bakery plants is very small. Plants producing crackers have the largest average size of sales, followed by plants producing buns, rolls, cookies, and bread products in decreasing order. Plants producing bagels and croissants have the smallest average size of sales.

Table 9. Geographic Distribution of Bakery Plants in the United States, 1996

State	# of Plants	Percent	State	# of Plants	Percent
Alaska	5	0.2	Montana	2	0.1
Arizona	26	1.1	Nebraska	16	0.7
California	314	13.1	New Hampshire	13	0.5
Colorado	26	1.1	New Jersey	110	4.6
Connecticut	32	1.3	New Mexico	11	0.5
District of Columbia	9	0.4	Nevada	10	0.4
Delaware	2	0.1	New York	217	9.1
Alabama	15	0.6	North Carolina	52	2.2
Arkansas	20	0.8	North Dakota	9	0.4
Florida	86	3.6	Ohio	111	4.6
Georgia	58	2.4	Oklahoma	24	1.0
Hawaii	27	1.1	Oregon	43	1.8
Iowa	21	0.9	Pennsylvania	180	7.5
Idaho	4	0.2	Rhode Island	18	0.8
Illinois	136	5.7	South Carolina	16	0.7
Indiana	58	2.4	South Dakota	8	0.3
Kansas	19	0.8	Tennessee	45	1.9
Kentucky	16	0.7	Texas	124	5.2
Louisiana	21	0.9	Utah	24	1.0
Massachusetts	87	3.6	Virginia	42	1.8
Maryland	35	1.5	Vermont	7	0.3
Maine	19	0.8	Washington	40	1.7
Michigan	85	3.5	Wisconsin	60	2.5
Minnesota	39	1.6	West Virginia	9	0.4
Missouri	36	1.5	Wyoming	2	0.1
Mississippi	6	0.3			

Source: *Bakery Production and Marketing: Red Book, 1996* (Cahners Publishing Co.).

Table 10. Distribution of Bakery Plants by Number of Products Produced, 1979-1996

Number of Products	1979		1990		1996	
	Number of Plants	Percent of Total	Number of Plants	Percent of Total	Number of Plants	Percent of Total
1 - 4	1,319	79	1641	68	1600	65
5 - 8	328	20	463	19	471	19
9 - 12	20	1	246	10	302	12
13 - 16	1	0	70	3	89	4

Table 11. Most Common Size of Bakery Plant in the United States, 1996

Product Type	Sales (million \$)	Flour Usage (1,000 lbs/week)	Number of Employees
Bread Plant	1 - 5	0 - 50	20 - 50
Bun Plant	10 - 25	150 - 300	100 - 250
Roll Plant	10 - 25	0 - 50	20 - 50
Bagel Plant	1 - 5	0 - 50	20 - 50
Frozen Dough Plant	1 - 5	0 - 50	20 - 50
Pizza Crust Plant	10 - 25	0 - 50	100 - 250
Croissant Plant	1 - 5	0 - 50	20 - 50
Sweet Goods Plant	1 - 5	0 - 50	20 - 50
Donut Plant	1 - 5	0 - 50	20 - 50
Cake Plant	1 - 5	0 - 50	20 - 50
Cookie Plant	1 - 5	0 - 50	20 - 50
Cracker Plant	75 - 100	500 +	500 - 1000

4.6.2 *Minimum Efficient Scale*

The minimum efficient scale of production (MES) for an industry is defined as the smallest production volume for which the unit costs reach a minimum. MES plays an important role in determining entry decisions and ability to survive. MES indicates the scale of operations required and capital investment needed to enter the industry. Generally speaking, the small MES of a specific industry makes it attractive to new entrants. In addition to MES, it is important to know the ratio of minimum efficient scale to the overall size of the market. The ratio indicates the required market share for a low-cost entry into a market.

Estimating MES requires information on output and cost at the level of the plant for the industry, which is difficult to obtain. In absence of cost information for the baking industry, a proxy measure (Comanor-Wilson approach) is used to estimate MES. The MES of the baking plant is measured as the mean size of the largest plants accounting for 50 percent of the baking industry sales.

This methodology was applied to the different sectors of the U.S. baking industry. The results indicate that a bakery plant should have an annual \$63 million sales value with 510 employees and 382,000 lbs. weekly flour usage to achieve the MES. The ratio of MES to the overall market size on national basis is about 0.2 percent, which indicates that a large portion of bakery plants are operating below the MES level. This is an industry with relatively low-cost entry.

The results also show the MES differs across the product categories. Cookie and cracker plants need relatively larger sales size (\$91 million annual sales) to achieve MES, while bread, bun, and roll plants should generate about \$55 million annual sales. Bagel and croissant plants can be operated at a significantly smaller scale to reach MES compared to cookie and cracker plants, \$30 million and \$22 million of annual sales, respectively (Table 12). However, to achieve the MES, a plant's production scale should be at least two to three times larger than the industry average. For example, average annual sales for all bread plants is \$14 million while the MES plant should have a sales size of \$54 million. The majority of bakery plants is operated under the MES level. According to the statistics, 94 percent of bread plants and 97 percent of cookie plants operate under the MES level. This implies that consolidations and shake-outs are expected to occur more frequently as more plants try to achieve MES in the bakery industry.

Table 12. Average U.S. Bakery Plant Size by Product and Estimated Minimum Efficient Scale

		Bread	Bun	Roll	Bagel	Frozen Dough	Pizza Crust
Average Plant Size	Employees	157	207	169	79	124	121
	Sales (millions)	14	19	15	7	13	12
	Flour Usage (1,000 lbs/week)	175	234	193	109	134	136
	No. of Plants	680	362	512	115	159	179
Estimated MES	Employees	440	481	458	236	434	337
	Sales (millions)	54	55	53	30	59	50
	Flour Usage (1,000 lbs/week)	387	410	403	333	328	306
	No. Of Plants	87	63	74	13	18	21
Average Size of Plants Operated at or Over MES	Employees	608	656	638	289	561	589
	Sales (millions)	76	75	74	41	76	84
	Flour Usage (1,000 lbs/week)	423	441	438	389	385	457
	No. of Plants	39	30	32	7	10	7
Average Size of Plants Operated Below MES	Employees	130	167	137	65	95	102
	Sales (millions)	10	14	11	4	9	829
	Flour Usage (1,000 lbs/week)	160	216	177	91	118	123
	No. of Plants	641	332	480	108	149	172

Table 12. (Continued)

		Sweet Goods	Croissant	Donut	Cake	Cookie	Cracker
Average Plant Size	Employees	112	83	173	135	149	399
	Sales (millions)	10	6	14	12	15	45
	Flour Usage (1,000 lbs/week)	90	56	136	99	118	313
	No. of Plants	287	70	126	312	359	69
Estimated MES	Employees	626	158	818	804	758	706
	Sales (millions)	69	22	84	89	91	91
	Flour Usage (1,000 lbs/week)	341	123	427	417	445	431
	No. Of Plants	20	10	11	21	30	17
Average Size of Plants Operated at or Over MES	Employees	808	175	844	857	813	750
	Sales (millions)	87	38	92	100	100	100
	Flour Usage (1,000 lbs/week)	412	163	450	429	453	425
	No. of Plants	13	2	8	7	8	5
Average Size of Plants Operated Below MES	Employees	79	80	127	119	134	371
	Sales (millions)	6	5	9	10	13	40
	Flour Usage (1,000 lbs/week)	75	52	114	91	110	304
	No. of Plants	274	68	118	305	351	64

4.7 Dynamic Changes in Industry

4.7.1 Acquisition and Merge

A significant trend in the baking industry over the last several years has been the acceleration of merger and acquisition activities. *Milling and Baking News* recorded 18 separate acquisition activities in 1995, 19 separate acquisition activities in 1996, and 12 separate acquisition activities in the first 10 months of 1997. Table 13 provides a summary of the acquisitions and mergers between 1995 and 1997. Many of the major firms such as Interstate Bakeries Corp., Flowers Industries, Inc., and Earthgrains Co. have been actively participating in the ongoing acquisition and consolidation of the baking industry during the past three years. Bakers foresee more consolidation in the wholesale baking industry through merger and acquisition activity.

Several reasons explain these merge and acquisition activities. First, acquisition has been the best way for a baking firm to strengthen its presence in a market and to gain synergies through consolidation of administration and product sourcing. Consolidation can also reduce industry capacity or avoid adding capacity to a sector where excess capacity is a threat to the incumbents. Examples for these acquisitions are Interstate Bakeries Corp.'s acquiring Continental Baking Co. and CPC International's acquiring Kraft Foods, Inc. in 1995; Inflo Holding's acquiring Keebler Co. in 1996, Interstate Bakeries Corp.'s acquiring San Francisco French Bread, and Lewis Bros. Bakeries, Inc.'s acquiring the Butternut Bread Plant in 1997. Baking firms have realized that buying an existing plant is cheaper than building a new one.

Second, acquisition provides opportunities for a baking firm to expand its geographical market. Acquiring existing plants and facilities where the firm had no presence before will help a firm to expand its business into this new area. Many baking firms have adopted this strategy to expand their market share. For example, Earthgrains Co. acquired Coopersmith Inc. in 1997 and Manhattan Bagel Co. acquired I. & J. Bagels, Inc. in 1995.

Third, small size bakeries usually have capital constraints, which limit their ability to make major technical improvements necessary to increase productivity and develop new products. Because many acquiring companies have substantial financial and marketing resources, they can invest large amounts of capital to increase productivity, develop new products, and build brand loyalty. For example, E. J. Noyce acquired J. J. Nissen Baking Co. in 1995.

Fourth, a bakery firm can increase product market accessibility through acquiring product distribution network and product brands. Through acquiring Kraft Foods, Inc. in 1995, CPC International got one of the best nationwide direct store distribution systems in which to distribute its products. Flowers Industries acquired Mrs. Smiths to enhance its frozen brand retail sales through Mrs. Smiths' national distribution network in 1996. Existing brand awareness is also a reason for acquisition such as Pillsbury's acquiring Pet Inc. and Interstate Bakeries' acquiring San Francisco French Bread.

Table 13. Mergers and Acquisitions in the U.S. Baking Sector, 1995-1997

Buyer	Acquired Firm	Year	No. of	Trans.	Products	Marketing	Comments
Interstate Bakeries Corp.	Continental Baking Co.	1995		\$520 million	Bread, roll, bun	Nationwide	The acquisition extends I.B.C.'s presence and gains synergies through consolidation of administrative functions and product sourcing.
Interstate Bakeries Corp.	San Francisco French Bread from Specialty Foods	1997			Specialty bread	California	I.B.C. added three new labels to its bread brands. It strengthened I.B.C.'s presence in California.
Interstate Bakeries Corp.	J. J. Nissen Baking Co.	1997			Bread, cake, frozen dough	Oregon, Maine, Mass., Rhode Island	It would increase Interstate's presence in the New England market and add brands to its product mix.
Earthgrains Co. and Interstate Bakeries Corp.	Earthgrains Co. and Interstate Bakeries Corp.	1996		Asset exchange	bread	Texas, Virginia	The asset exchange will allow both companies' operations to be more cost-effective and in a position for growth in the bakery markets.
Earthgrains Co.	Heiner's Bakery, Inc.	1996	1 Plant and 100 delivery routes		Bread, bun, roll	West Virginia	The acquisition fits Earthgrains' strategy of building brands and increasing branded mix of products.
Earthgrains Co.	Coopersmith, Inc.	1997			Bread	Southeast Region	The acquisition gave Earthgrains its first plants in Massachusetts, North and South Carolina.
Flowers Industries, Inc	Big Bear Stores, Inc.	1995	1 Plant		Bread, bun, roll	Ohio, West Virginia	Flowers will supply the Big Bear supermarket chain.
Flowers Industries, Inc	Holsum Baking Co.	1995				Arkansas	
Flowers Industries, Inc	Storck Baking Co.	1995			Bread, bun, and roll.	Virginia, Ohio, Kentucky, Pennsylvania.	Flowers will continue operating Storck and serve its customers.
Flowers Industries, Inc.	Pet, Inc.	1995	2 Plants		Bun and sweet snack	Georgia	Strengthens Flower Industry's presence in Georgia.
Flowers Industries, Inc.	Mrs. Smiths of J. M. Smucker Co.	1996			Frozen pies	Nationwide	Mrs. Smith's consumer franchise and national distribution network give Flowers the framework to enhance its frozen branded retail presence.
Flowers Industries, Inc.	Shipley Baking Co.	1996	1 Plant		Bread and roll	Arkansas, Oklahoma, Missouri	It would allow both companies to strengthen and expand their brand presence in the region.
Flowers and Invus Group	Keebler Company	1996	8 Plants	\$487.5 million	Cookie and cracker	Nationwide	Flowers and Invus Group formed a 50/50 joint venture to acquire Keebler.

Table 13. (Continued)

Buyer	Acquired Firm	Year	No. of	Trans.	Products	Marketing	Comments
Flowers Industries, Inc.	Allied Bakery Products, Inc.	1997			Partial or full baked bread and roll	New York	The alliance is not involved in the baking of products, it focuses on the freezing and shipping of partially or fully baked breads and rolls.
Nabisco, Inc.	Salerno Division of Sunshine Biscuits	1995	1 Plant		Cookie and cracker	Illinois	The acquisition is to increase the production capacity in that area.
CPC International Inc.	Kraft Foods, Inc	1995	15 Plants	\$865 million	Bread, sweet goods, muffin	Nationwide	It will give CPC one of the best nationwide direct store delivery systems. It will also strengthen the presence of CPC's consumer foods business.
Pillsbury	Pet, Inc.	1995		\$2.6 billion	Frozen waffle and pie crust	Missouri, Georgia, Pennsylvania	The acquisition provides Pillsbury with growing brands and customers.
Keebler Company	Sunshine Biscuits, Inc.	1996			Biscuit	California, Georgia, Kansas, New Jersey	Sunshine is strong on the coasts and Keebler is strong in the Midwest, Southeast, and Southwest.
Tasty Baking Co.	Dutch Mill Baking Co., Inc.	1995			Donuts, cake, cookie, muffins	New Jersey, New York	It supplements Tasty Baking's strategic plan to build its business through geographic expansion and new product development.
Tasty Baking Co.	Emerald Snack Food Plant of former Keebler	1996	1 Plant		Snack	Pennsylvania	The acquisition is a continuation of the company's strategy to increase its core business and expand geographically.
Big Apple Bagels	Chesapeake Bagel Bakery	1996	151 Units	\$ 29 million	Bagel	Eastern States	The acquisition brings BAB into markets in the East with a superb product, strong brand name recognition, and franchise system.
Big Apple Bagels, Inc.	My Favorite Muffin Too, Inc.	1997			Muffin and bagel	East Coast	
Manhattan Bagel Co.	I.&J. Bagels, Inc.	1995		1.5 million shares of stock		California	The acquisition marks Manhattan Bagel's entry into the California market.
Manhattan Bagel Co.	Bay Area Bagels, Inc.	1995	8 Stores	\$158,000 in cash and 73,000 stock share	Bagel	California	The acquisition broadens Manhattan Bagel's market reach to the western coast area.

Table 13. (Continued)

Buyer	Acquired Firm	Year	No. of	Trans.	Products	Marketing	Comments
Burns & Ricker Inc.	Bagel Chip Co.	1995			Bagel	New York	Nabisco divestitures Bagel Chip Co. for focusing on business where it is either a major player or has a strong niche position.
Dawn Food Products, Inc.	Knaub's Cakes	1997			Frozen cake	Pennsylvania	It will increase Dawn's access to retail, in-store, and food service markets.
Dubilier & Co.	CPC International Inc.	1997			Toast	New York	Increasing product capacity. Utilization of management team and work force.
Edwards Baking Co.	Mother Butler Pies from Fagstar Companies, Inc.	1996	4 Plants		Frozen pie	California, Florida, Illinois, Washington	Edwards becomes a supplier of Denny's. It will increase sales of Edwards by leveraging distribution capabilities and new sales channels.
Einstein Bros. Bagels, Inc.	Noah's New York Bagels, Inc.	1996	37 Stores	\$100 million	Bagel	California, Washington	Noah's is the dominant bagel retailer on the West Coast with a loyal customer base.
Schwebel Baking Co.	Kaufman's Ohio Bun Plant	1995	1 Plant		Bun	Ohio	The acquisition provides Schwebel the access to serve the fast-food business.
Schwebel Baking Co.	Flowers Industries, Inc.	1997			Sales routes	Ohio, Pennsylvania	Schwebel will be the exclusive distributor of some of Flowers' products.
Lewis Bros. Bakeries, Inc.	American Bread Co. Plant of Coopersmith, Inc.	1995	1 Plant			Tennessee	The plant will be consolidated into the existing plant at another location.
Lewis Bros. Bakeries, Inc.	Butternut Bread Plant from I.B.C.	1997	1 Plant		Bread	Illinois	To increase Lewis Bros.' presence in the Illinois and Wisconsin area.
Kellogg Co.	Mountain Top Baking Co.	1996	1 Plant		Convenience foods	Kentucky	To supplement Kellogg's marketing and product development work in convenience foods.
Kellogg Co.	Lender's Bagels from Kraft Foods	1996	4 Plants	\$455 million	Bagels	Connecticut, Illinois, New York	The acquisition aimed to expand Kellogg's convenience foods business.
E. J. Noyce	J. J. Nissen Baking Co.	1995			Bread, cake, frozen dough	Oregon, Massachusetts	To provide Nissen needed capital to upgrade its production facilities and a platform for growth.
Foodbrands America, Inc.	TNT Crust, Inc.	1995	2 Plants	\$33.4 million	Par-baked pizza crust	Wisconsin	To broaden its product offerings and further expand it into a growing niche market.
Four-S Baking	Trademark from Interstate Bakeries	1997			Bread Trademark		Four-S Baking expects to increase its presence in the market with acquisition of the brand.

Table 13. (Continued)

Buyer	Acquired Firm	Year	No. of	Trans.	Products	Marketing	Comments
Frito-Lay, Inc.	Eagle Snacks of Anheuser-Busch	1996	4 Plants		Snack	North Carolina, Tennessee, California, Pennsylvania	The acquisition increases Frito-Lay's geographic coverage and production capacity.
Grupo Industrial Bimbo	Pacific Pride Bakeries	1996	1 Plant		Bread, bun, roll	California	Marking Bimbo's first venture into bread baking in the United States.
Hazelwood Farms Bakeries	Signature Breads	1997			Par-baked bread and roll	Massachusetts	The acquisition will strengthen Hazelwood Farms' presence in both in-store and food service baking business.
Leon's Bakery, Inc.	Best Brands, Inc.	1996			Sweet goods, mixes, frozen dough	Minnesota	
Maple Leaf Foods, Inc.	Frozen Division of Pioneer French Bakery, Inc.	1996	1 Plant		Bread	California	The acquisition significantly expands the company's U.S. specialty bread business.
Metz Baking Co.	Cambell Taggart	1995	2 Plants		Bread and Bun	Illinois	Metz Baking aimed to enhance its presence in Illinois and Wisconsin.
Mountain View Harvest Co-op	Gerard's French Bakery	1997				Colorado	
Mrs. Fields Cookies	Original Cookie Co.	1996	500 Outlets		Cookie	Nationwide	The merger would result in more than 1,000 company-owned and franchised stores in the U.S.
New York Bagel Enterprises	Lots A' Bagels	1996		\$2.7 million	Bagel	Colorado	
Onex Investment Corp.	Edwards Baking Co. and Tripp Bakers Products	1995			Frozen desserts, pie, cake, bread	Georgia, Illinois	This is a series of actions of Onex Investment Corp. with the objective of creating a new U.S. food company over a period of several years.
United States Bakery	Gai's Seattle French Baking Co.	1997	3 Plants			Oregon, Washington	The acquisition is aimed to better serve the customers and compete more effectively against the giants of the baking industry.
Van de Kamp's, Inc.	The frozen business of The Quaker Oats Co.	1996			Frozen pizza	Tennessee	

Fifth, acquisition is also a choice for new firms who seek to enter the bakery market. Low entry cost, existing distribution network, and established customer relationships associated with acquisition will facilitate a firm's entering the market and avoid adding capacity to reduce the possible reaction of incumbents. Onex Investment Corp. and Maple Leaf Foods, Inc. used this strategy to enter the U.S. bakery market.

4.7.2 Strategic Alliance

In addition to merger and acquisition activities, some other activities may have an even greater influence on the structure of the bakery industry. These are the ventures grouped under the strategic alliance. These partnership-forming activities mainly took place in route acquisition and distribution alliance. A strategic alliance allows both partners to have a better focus on their core business and cost saving while expanding their geographical market extent.

During 1996 and 1997, several baking firms formed strategic distribution alliances to explore the efficiency of the supply chain. Uncle B's Bakery and Heinz Bakery Products signed an agreement in 1996 that Uncle B's Bakery will supply frozen bagel dough to Heinz. Earthgrains signed a five-year contract with Jitney-Jungle to provide its products to Jitney-Jungle stores nationwide. Mother's Cake & Cookie Co. expanded marketing of its products to 13 additional states through a long-term distribution agreement with The O'Boisie Corp. Mrs Baird's and CPC Baking reached an agreement under which Mrs Baird's Bakeries would be the exclusive distributor of the complete line of CPC Baking Business products in the Texas market. Schwebel Baking Co. acquired the central Ohio sales routes of Flowers Industries, Inc. Schwebel will operate the routes, which supply bakery products to customers in central Ohio and Pittsburgh under the agreement. In addition, Schwebel will be the exclusive distributor of Flower's snack cake and pastries in the region (*Milling and Baking News*).

4.7.3 Entry and Exit

Entry and exit of firms have been recognized as two of the major determinants of market structure. An examination of entry and exit as well as its post entry performance provides an interesting understanding of the structural dynamics of the bakery industry (Tables 14 and 15).

From 1979 to 1990, 769 bakery plants exited and 1,487 plants entered this section, while 899 plants stayed. For those 899 plants who stayed, about 18 percent exited during 1990 to 1996. New entrants tend to have a relatively lower survival rate. For those 1,487 new entrants during 1979 to 1990, about 30 percent of plants did not survive during 1990 to 1996.

From 1990 to 1996, 621 plants exited, and 642 bakery plants entered this section while 1,765 plants stayed during 1990 to 1996. Compared with the period from 1979 to 1990, incumbents during 1990 to 1996 were of greater importance relative to entrants.

Table 14. Dynamic Changes in the U.S. Baking Industry, 1979 - 1996

	Number of Plants 1979 - 1990	Number of Plants 1990 - 1996
Exit	769	621
Exist	899	1,765
Enter	1,487	642

Source: *Bakery Production and Marketing: Red Book 1979, 1990, 1996* (Cahners Publishing Co.).

Table 15. Surviving Rate of New Entrants and Incumbents, 1979 - 1996

	No. of Plants Exit 1990-1996	Percent	No. of Plants Exist	Percent	Total Plants
Exist 1979-1990	163	18	736	82	899
Enter 1979-1990	458	31	1,029	69	1,487

Source: *Bakery Production and Marketing: Red Book 1979, 1990, 1996* (Cahners Publishing Co.).

Dynamic changes of bakery plants are analyzed from the perspective of number of products produced, sales size, and employment size for exiting plants, existing plants, and new entrants. The first group is classified as exiting plants, which represent those plants exiting the industry in a certain period. The second group is classified as existing plants, which refer to those plants existing both at beginning and end of the study period. The third group is classified as entering plants, which represent those plants entering the industry during a certain period.

There were 899 plants classified as existing plants during 1979 to 1990. The total plants producing three products or less dropped from 680 to 611 while total plants producing four products or more increased from 219 to 288. During 1990 to 1996, 1,765 plants were classified as existing plants. The number of plants producing three products or less decreased from 1,078 to 1,038. The number of plants producing four products or more increased from 687 to 727. The results showed some bakery plants increased the number of products produced over the time, but the evidence is not strong enough to show the correlation of plant existence and number of products it produced. However, about 45 percent of new entrants in the baking industry produced four products or more (Table 16). This indicates many new entrants did use a product diversifying strategy to enter the market.

Table 16. Number of Products Produced by Plant: Entry, Stay, and Exit

Period	Plants	Products Produced		Total Plants
		3 or Less (%)	4 or More (%)	
	Exit	71	29	769
1979-1990	Plants exist in 1979	76	24	899
	Plants exist in 1990	68	32	899
	Enter	54	46	1,487
	Exit	55	45	621
1990-1996	Plants exist in 1990	61	39	1,765
	Plants exist in 1996	59	41	1,765
	Enter	56	44	642

The statistics show that a large portion of plants exiting or entering the market are small in employment size. However, the whole baking industry is also comprised of small bakery plants. Larger plants, measured as employment size, have higher probability to survive over time. But the ratio of number of exiting plants versus the number of existing plants with large employment size is also high (Table 17). The results indicate that a plant's employment size is not a determining factor impacting entry and exit decisions. Other factors such as regional supply and demand condition, market size, baking technology, and efficiency may be more important. For those plants existing over a certain period, there is a tendency for a plant to increase its size. For instance, 12 plants fell into the employment size of 250 to 500 in 1979. The number of plants with this size increased to 112 in 1990 while small size plants classified as existing groups decreased over the time. The same trend also occurred during 1990 to 1996, when the number of plants with this size increased from 138 in 1990 to 161 in 1996.

The statistics show that most exit and entry behavior happened with plants with sales less than \$10 million, especially those with sales less than \$5 million. Since most entering and existing plants are small in both employment and sales, it suggests the bakery industry is a low- cost entry market. Thus, one will continue to observe new firms entering this market. The surviving rate of large plants is significantly higher than those small sales size plants. Over time, those plants that survived over a certain period expanded their sales to a larger scale. Many plants increased their sales from less than \$10 million to more than \$10 million. For those plants existing during 1979 to 1990, 72 plants had sales values ranging between \$10 to \$25 million in 1979. The number of plants with this sales range increased to 134 in 1990 while the number of plants with sales less than \$10 million decreased. In 1996, the most significant increase was the number of those existing plants with sales more than \$25 million (Table 18). The results indicate that the bakery market is going to become highly competitive quickly as more firms try to expand this market.

Table 17. Employment Size of Bakery Plant: Exit, Stay, and Enter

Period	Plants	Number of Employees				Total No. of Plants
		0-50 (%)	50-250 (%)	250-500 (%)	500+ (%)	
1979-1990	Exit	36	38	1	5	757
	Plant exist in 1979	27	65	1	8	891
	Plant exist in 1990	26	52	13	10	891
	Enter	65	30	4	2	1,477
1990-1996	Exit	58	34	4	4	618
	Stay in 1990	48	40	8	5	1,750
	Stay in 1996	44	41	9	6	1,750
	Enter	66	27	3	4	637

Table 18. Plant Sales Size: Entry, Stay, and Exit

Period	Plants	Sales (million \$)					Total No. of Plants
		0-1 (%)	1-5 (%)	5-10 (%)	10-25 (%)	25+ (%)	
1979-1990	Exit	27	40	25	4	3	726
	Plants exist in 1979	14	40	31	10	6	740
	Plants exist in 1990	13	34	22	18	13	740
	Enter	39	42	8	6	4	1,137
1990-1996	Exit	35	43	10	5	6	474
	Plants exist in 1990	27	38	14	13	8	1,403
	Plants exist in 1996	26	34	13	14	13	1,403
	Enter	51	30	7	7	6	490

5. CONCLUSIONS

Demand for bakery products has been increasing over the past several years. The baking industry itself is also going through dynamic changes. The purpose of this study was to analyze the bakery product market and the dynamic structure of the baking industry.

Per capita consumption of most bakery products has shown a steady upward growth trend. However, the increase in per capita consumption is not distributed evenly among product segments. Variety breads, bagels, and frozen bakery products are among the fastest growing categories. White pan bread, cake-type doughnuts, and pies are losing their market share to other bakery products. Factors affecting consumers' demand include children's influence, convenience, diet and health concerns, and a growing ethnic market.

The geographic scope of a single baking plant is limited. As a result of product perishability, multi-plant firms at different geographic locations have an advantage over a single large concentrated plant. This explains why most baking plants are relatively small and scattered around the population center. The baking industry is fragmented, with the majority of baking plants operating under the MES level. This implies that consolidations and shake-outs are expected to happen more frequently as more plants try to achieve MES to improve their production efficiency.

A significant trend in the baking industry has been the acceleration of merger and acquisition activities. Acquisitions offer a firm the opportunity to strengthen its market presence, to expand geographically, and to increase productivity and market accessibility. The analysis indicates that product structure, sales size, and employment size affect a bakery plant's ability to survive over time. The results show that large plants have a higher survival rate.

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