Globalization of the Processed Foods Market. Edited by Dennis R. Henderson, Charles R. Handy, and Steven A. Neff. Food and Consumer Economics Division. Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 742.

Abstract

International commerce in processed foods substantially exceeds the value of unprocessed agricultural commodities and is expanding more rapidly. International trade in processed foods has been the most rapidly growing portion of world food and agricultural trade during the past decade. Even more significant, however, are sales from foreign affiliates of food manufacturing, grocery wholesaling and retailing, and food service firms. Foreign affiliation is acquired through foreign direct investment in foreign plants and facilities. U.S. food manufacturers' sales through foreign affiliates were more than quadruple the value of processed food exports from the United States. Foreign food manufacturers' sales through U.S. affiliates were more than double the value of processed food exports to the United States. Patterns of global commerce in processed foods are influenced by public policies addressing transportation, communication, rules for regional and multinational trade, food product and process standards, the environment, and intellectual property.

Keywords: food and agricultural trade, foreign direct investment, global marketing stategy, international commerce, multinational firms, product standards, trade and investment policy

Washington, DC 20005 September 1996

Acknowledgments

The editors are deeply indebted to many people without whose efforts this publication would not exist. Fred Ruppel and Margaret Malanoski head the list; in addition to writing a number of sections, they were intimately involved in planning and reviewing many parts. Fred, in particular, deserves special recognition for initial drafts of sections that were key in motivating the project. Nedra Williams also deserves particular acknowledgment for word processing and preparation of tables and figures. Of critical importance were external reviewers Bill Coyle, John Nichols, Michael Reed, and Jerry Sharples. Thanks to Tom McDonald, our technical editor, and Jack Harrison, who prepared the summary. To all of these people, and to our many colleagues who have encouraged this work, compiled related information, written the literature cited in references, and performed innumerable tasks essential to a work of this magnitude, we offer our sincere gratitude.

Contents

Foreword

The globalization of the U.S. economy has received prominent attention in recent years. In the food and agriculture sector, this attention has spilled over into a focus on trade in farm commodities. Less broadly recognized has been globalization in the processed foods market. Yet, this has paralleled trends in the economy as a whole and, in many ways, is both more extensive and more eclectic than international commodity trade. For example, about two-thirds of all international trade in the food and agricultural sector is comprised of processed foods. What is more, international commerce in processed foods takes many forms in addition to imports and exports. The most prevalent means by which processed foods reach overseas markets is through domestic firms that operate affiliated foreign processing and distribution facilities. The processed foods market reflects its global character in numerous other ways as well.

In this publication, patterns of international commerce in processed foods are described. The impacts of such commerce on U.S. and foreign consumers, agricultural producers, and firms and employees in the food-related industries are examined. The dominant factors that motivate international trade, the operation of foreign affiliates, and other international commercial practices in the processed food sector are identified. The leading firms that account for a significant share of international commerce in processed foods are discussed in terms of who they are, how they are organized internationally, and what they do in global markets.

Public policies that influence global commerce in processed foods are also examined. This includes national and international policies aimed specifically at the processed foods sector. Also included are the implications of broader policies, such as those dealing with economic stability, national infrastructure, the environment, and intellectual capital. Most people think of international trade as the policy arena of choice for influencing global commerce. Because international commerce in processed foods is the result of many more commercial activities than exporting and importing, a policy

focus limited to trade misses much of what is particularly relevant to the sector. Without the information provided in this publication, public policies may be enacted that will have unintended consequences on global commerce in the sector that are detrimental to the interests of both consumers and the food-related industries.

This publication provides a more complete understanding of patterns of global commerce in the processed foods sector, their causes and their consequences, to those people who influence the formation of public policies that affect such commerce. The purpose is to foster informed debate on the policy issues of the day in such a way that society at large gains the greatest benefits from global interaction in the markets for processed foods.

In the end, globalization is not a destination at which the processed foods industries will someday arrive. Rather, globalization is a process that may change directions, with many features assuming greater or less prominence through time. This report moves beyond anecdote. It details what has happened, how it has happened, why it has happened, why it matters, and to whom it matters. It is organized into two parts: Part I describes and analyzes what is, while Part II addresses related policy issues as a means of affecting what will be.

Executive Summary

Size of Processed Food Sector

Processed foods constitute the largest product manufacturing and distribution sector in the U.S. economy, accounting for more than one-sixth of the nation's industrial activity. In 1994, the total value of domestic food product shipments was $430 billion. By contrast, total farm cash marketing receipts from livestock and crops production was less than $200 billion. Value-added by the food processing, wholesaling, retailing, and food service industries was $372 billion, more than four times greater than the $84.6 billion value-added in the farm sector.

But even more, the processed food sector is a major participant in the global economy. The United States accounts for about one-fourth of the industrialized world's total production of processed foods. Six of the largest ten, and 21 of the largest 50 food processing firms in the world are headquartered in the U.S. Through a combination of imports and exports of foods and food ingredients, foreign production by U.S. food firms, host production by foreign food firms, and other international commercial strategies, the U.S. processed foods market is truly global in scope. Indeed, such easily recognized U.S. food brands as *Kellogg's* and *Hellmann's* are so well received internationally that many consumers in other countries accept them as leading local brands. As well, such seemingly-American brands as *Pillsbury* and *Almond Joy* are owned by foreign firms.

Processed Food Trade

In terms of international trade, the processed foods sector surpasses agricultural commodities by a considerable margin. In 1993, the global value of international trade in processed foods and beverages, at $256 billion, accounted for two-thirds of all trade in food and agricultural commodities. The annual value of U.S. exports of processed foods has exceeded bulk agricultural commodities since 1991. U.S. processed food exports reached

$24.4 billion in 1993, well above the $18.8 billion in bulk commodity exports. During the past quarter century, the nominal value of total world trade in processed foods has increased at an average annual rate of about 10.5 percent; U.S. imports have grown at a slightly slower 9-percent rate while export growth has averaged 13 percent.

Foreign Direct Investment

The international character of the processed foods market is even more dramatically reflected in trans-national activities of food processing and distribution firms. Such activities are ubiquitous throughout the processed food sector. They are dominated by firms' operation of foreign affiliates, that is, processing and distribution facilities located in other countries. Generally known as foreign direct investment (FDI), in essence this is how many firms "export" their strategies for enhancing sales in their home market to markets abroad. In 1994, sales from foreign affiliates of U.S. processed food firms exceeded $100 billion, more than four times the total value of U.S. exports of processed foods. Most of these sales are in foreign markets; only about 2 percent are shipped to the U.S. At the same time, American affiliates of foreign firms sold more than $45 billion in processed foods in the U.S., exceeding twice the level of U.S. imports.

Impacts on Consumers and Business

The global nature of the processed food market has important, and generally favorable, impacts on consumers and businesses in both the U.S. and other countries. Characterized by differentiated products and economies associated with size, scope, and scale of operations, the processed food market is different from the textbook case of comparative advantage in international trade. Indeed, a large share of international trade in processed foods is intra-industry, that is, a country simultaneously imports and exports similar goods. For example, U.S. imports and exports are nearly equal for products produced by the meat packing, baking, confectioneries, and preserved fruits and vegetables industries. Such two-way trade

simply would not occur in a textbook world of comparative advantage.

Thus, the impacts of international commerce in processed foods are different from those associated with international specialization and the theory of comparative advantage. The case is most clear for consumers. They benefit from the availability of a wider array of products and from greater rivalry among sellers in the marketplace: rivalry that encourages product innovation, production and distribution efficiency, and competitive prices. Reflecting *inter alia* competitive pressure from abroad, labor productivity in food processing, for example, is 30 percent greater in the U.S. than elsewhere.

Generalities are more difficult for the business side. While food processing and distribution firms, their employees and investors as a whole benefit from the increased volume of commerce associated with global markets, dislocations occur. Global competition means that those firms regardless of nationality that have the most effective product development, process, and marketing strategies succeed; others are forced to be equally clever or fall by the wayside.

Strategies to Access Foreign Markets

Actual patterns of international commerce in processed foods are more vested in the marketing strategies of firms than in national endowments of natural resources. To be sure, a country's productivity of land, factories, transports, warehouses, and stores affects the ability of firms located therein to compete internationally, as does the relative stability of its economy and currency. But, much also depends upon the behavior of its firms. Their behavior is in part a product of environment, affected by things such as a nation's transportation and communications infrastructure, its stock of knowledge and public market information, and its policies that encourage, or protect firms from, rivalry in the domestic and international marketplace. But, it is also very much a product of initiative by the people who make up the firms: both their physical productivity in terms of such things as

units sold per hour of work, and their intellectual productivity in terms of such things as devising new products, developing more effective processing, merchandising, and delivery systems, and creating strong brands and trademarks.

While international trade and sales through affiliated foreign operations dominate global marketing activities of processed food firms, actual strategies in any given market situation are eclectic, reflecting a firm's unique capabilities. Firms actually use a wide variety of global market strategies including international product licensing, joint production and distribution ventures with foreign partners, international franchising, and contract production in addition to trade in goods and foreign direct investment. Often, even though in aggregate FDI prevails, firms use a number of different strategies both sequentially and simultaneously, the mix changing with a firm's experience and results, and with market conditions. It is sometimes alleged that firms use exports as a precursor to FDI, which in turn displaces trade. However, evidence of such a relationship has not been found. Rather, both FDI and trade, along with other strategies, go into the mix of global marketing. The balance appears to be continuously evolving as firms seek to maximize their unique marketing advantages.

Nonetheless, regional differences are evident. For example, processed food firms with headquarters in North America appear, on balance, to rely more heavily on sales from foreign affiliates than on trade compared to firms headquartered in other industrialized countries, particularly the European Union. Further, comparing U.S.-based firms with those based elsewhere, in general the former have historically been oriented less to international markets than to their home market. The difference, however, is narrowing.

Public Policies

Both national and international policies can influence, but probably not predestine, actual commercial patterns. Some policies, such as those affecting a country's infrastructure, catch processed foods in their web but are driven by broader considerations. Others are aimed directly at influencing international commerce in processed foods;

for example, multilateral trade agreements and food product and process standards. Still others, including those addressing environmental issues and intellectual capital, have both general and sector-specific purposes.

Transportation and Communication

National infrastructure policies affect the ability of a nation's firms to pursue global marketing strategies. For processed foods, particularly important linkages exist with the communications and transportation sectors. Technical innovations in both communications and transportation enhance efficiency in the production and distribution of processed foods, improve managerial control and responsiveness, and help identify and fulfill new commercial opportunities. In the U.S., policies that have reduced direct government control in these sectors and that have fostered evolution of competitive communications and transportation industries are tied directly to international commercial gains in processed foods. An international spread of deregulatory policy is expected to generate greater advantage for product trade than for foreign production (FDI).

International Trade Agreements

International policies, such as multilateral trade agreements that reduce barriers to international trade, can reduce the cost of international commerce as effectively as technological advance in transportation or communications. Creation of the World Trade Organization (WTO) portends an expansion of global commerce not only by reducing national protections of domestic industries, but also by creating a binding procedure for resolving trade and investment disputes between countries. The North American Free Trade Agreement (NAFTA) launches an even tighter binding of the processed foods industries among the North American countries. Because these agreements focus more on policies to liberalize trade than on investment measures, they are expected to result in greater growth in processed food export and import than in sales from foreign affiliates. Particularly relevant to the future direction in FDI

is reaching multinational accord on national competition or industrial policies, for example, resolving differences in providing financial support and other protections for industries chosen to be "national champions."

Standards and Regulations

With reductions in tariffs and quantitative trade barriers arising from multilateral agreements such as the WTO and NAFTA, technical standards and regulations in the processed foods industries are subject to more scrutiny. In the presence of rising demand from consumers for higher quality and food safety, standards and regulations must protect consumers without restricting the marketing of innovative products. Under the provisions of the new multilateral accords, standards and regulations can be challenged as unwarranted trade barriers if they cannot be shown to be based on sound science and appropriate risk assessment. Further, international standards organizations are emerging as a means to rationalize national differences. The extent to which rationalization results in harmonization of national differences to a single multilateral standard, or mutual recognition of equivalency, is likely to have strategic implications for global marketers of processed foods, with trade the likely beneficiary of harmonization.

Environmental Policies

Environmental policies generate concern that national differences alter patterns of international commerce in processed foods by imposing differential costs on firms located in countries with high environmental safeguards such as antipollution measures, or by restricting trade with such things as "ecolabeling" requirements (e.g., dolphin-safe labels on canned tuna). Multilateral accords are beginning to emerge in an attempt to achieve international harmonization of environmental regulations as part of broader trade liberalization measures. Even when environmental standards are harmonized toward the most stringent, because the additional costs in the processed food sector are a small share of total costs, this appears to have little overall impact in terms of limiting gains

associated with increased trade. Countries with low standards, however, gain substantially in environmental quality from harmonization.

Intellectual Capital

Both national and international policies affect the creation of intellectual capital and the protection of intellectual property. Firm-specific advantages, major factors driving global commerce in processed foods, result from the creation of intellectual capital and the ability of a firm to protect that capital from being cheaply copied by rivals. National policies supporting basic education and research are fundamental to the creation of intellectual capital. To the extent that significant national differences exist, they have much to do with which countries' firms become more, or less, involved as originators of international commerce in processed foods. Public policies that protect a firm's right to commercially exploit unique advantages generated by intellectual activity have much to do with where a firm chooses to do business. Recent international agreements to mutually recognize patents, copyrights, and trade secrets will encourage greater global commerce. However, creating unassailable protections will chill the rivalry among firms that drives the globalization process.

Globalization of the Processed Foods Market

PART I: The Processed Food Sector in Global Perspective

The four chapters of Part I address patterns of global commerce in processed foods, place such commerce in context relative to both the processed foods sector as a whole and to the agricultural sector, and analyze such commerce in terms of both its driving forces and its consequences. Chapter 1 describes the sector, conveys the role of the related U.S. industries in international commerce, and examines the implications of globalization on consumers, firms in the food and agricultural sector, and others. Chapter 2 describes patterns and trends in international trade in processed foods, discusses the extent to which the United States imports and exports similar products and the importance of such "two-way" trade, and examines the factors that affect these patterns of trade. Chapter 3 addresses foreign direct investment in the processed foods sector, the impetus behind direct (as opposed to portfolio) investment, and the involvement of the U.S. food processing, wholesaling, retailing, and food service industries in foreign direct operations. Chapter 4, perhaps the core of the report, sifts through information on the leading firms in the processed foods sector, outlines their organization and their methods of doing business globally, and examines the issue of whether firms' decisions to operate foreign facilities affect U.S. trade performance.

Definitions and Clarifications

As with any classification scheme, there are multiple ways of deciding what is or is not a processed food product. This report adopts the definition of "Food and Kindred Products" in the Standard Industrial Classification (SIC) system developed by the U.S. Department of Commerce. The SIC is the statistical classification underlying all establishment-based U.S. economic statistics that are classified by type of industry (OMB, 1987). It assigns establishments to industry groups based on their principal economic activity. Under the SIC system, establishments or plants that produce similar products, use similar processes, or provide similar services are assigned the same two-digit code number. The 49 industries in the processed foods sector are known as "Food and Kindred Products" and fall into group SIC-20, as listed in table 1.[1]

SIC-20 includes establishments that manufacture or process foods and beverages for human consumption, as well as certain related products, such as chewing gum, fats and oils, and animal feeds. SIC-20 includes only foods, not agricultural products in general. Thus, tobacco products and textiles are not included in SIC-20, even though they are derived from agricultural operations. Similarly, the processed foods industries include fresh meat products and processed seafood, but not fresh fruits and vegetables. However, the processed foods category does include some products that are excluded when the Department of Commerce calculates output from the agricultural sector. Prominent among these products are: aquaculture output, such as frozen fish and canned

[1]Three other industries are closely connected to food processing: food wholesaling (a portion of SIC-51), food retailing (SIC-54), and food service (SIC-58). Food wholesaling and food retailing together constitute the food distribution system, our food-at-home marketing network. Wholesale and retail firms work to ensure that a ready supply of a large variety of food products is available on demand to consuming households. Major functions of this network include food product assembly and distribution, product transportation, and storage and preservation. The food service industry constitutes the "away-from-home" food consumption market. This industry is dominated by restaurants and fast-food outlets, but also includes other commercial establishments, plus food service in establishments that cater to in-house residents, such as nursing homes and educational institutions.

tuna; tree produce, such as ground coffee and shelled nuts; and alcoholic beverages, since they are derived from grains and fruits.

Products in SIC-20 must be value-added products, which do not always correspond to the more problematical "high-value products" designation. Fresh fruits, seafood items, and unshelled nuts are examples of high-value products that have undergone no processing, and hence are excluded from SIC-20. Conversely, some "low-value" products are included in SIC-20, such as animal feeds and manufactured ice, because some processing had to take place to get the product to the customer. A final clarification was alluded to earlier, the distinction between intermediate goods and final goods. Many processed food products serve as inputs into other manufactured foods and other goods, particularly those in the dairy products, grain mill products, and fats and oils categories. All of these items are included in SIC-20, whether the final destination is use as an intermediate product or consumption as a final good. In addition, many products are sold at a number of value-added levels. For example, beef sold "on hoof" is listed as a raw commodity. However, as beef moves further down stream toward the consumer, it is always listed in the processed food category, whether it is sold as carcass beef (slaughter), as boxed beef (initial packaging), or as final cut (shrink-wrapped in the grocery display case).

Table 1—Standard Industrial Classification (SIC) codes for food and kindred products

SIC	Product description	SIC	Product description
20	Food and kindred products	206	Sugar and confections
201	Meat products	2061	Cane sugar, raw
2011	Meat packing	2062	Cane sugar, refined
2013	Sausage and prepared meats	2063	Beet sugar
2015	Poultry dressing plants	2064	Candy and confectionery products
202	Dairy products	2066	Chocolate and cocoa products
2021	Creamery butter	2067	Chewing gum
2022	Cheese, natural and processed	2068	Salted and roasted nuts and seeds
2023	Condensed and evaporated milk	207	Fats and oils
2024	Ice cream and frozen desserts	2074	Cottonseed oil mills
2026	Fluid milk	2075	Soybean oil mills
		2076	Vegetable oil mills
203	Preserved fruit and vegetables	2077	Animal/marine fats and oils
2032	Canned specialties	2079	Shortening and cooking oils
2033	Canned fruit adn vegetables		
2034	Dried fruit and vegetables	208	Beverages
2035	Sauces and salad dressings	2082	Malt beverages
2037	Frozen fruit and vegetables	2083	Malt
2038	Frozen specialties	2084	Wines, brandy, and brandy spirits
		2085	Distilled and blended spirits
204	Grain mill products	2086	Soft drinks and carbonated water
2041	Flour and grain mill products	2087	Flavorings, extracts, and syrups
2043	Breakfast cereals		
2044	Rice milling	209	Miscellaneous
2045	Blended and prepared flours	2091	Processed fishery products
2046	Wet corn milling	2092	Fresh fish
2047	Dog, cat and other pet food	2095	Roasted coffee
2048	Prepared animal feed	2096	Potato chips
		2097	Manufactured ice
205	Bakery products	2098	Pasta products
2051	Bread and other	2099	Other food preparation
2052	Cookies and crackers		
2053	Frozen bakery products, excl. bread		

CHAPTER 1
The U.S. Food Sector

Food Processing and Distribution in the United States

The food processing industries are the largest manufacturing sector in the U.S. economy, accounting for approximately 14 percent of total U.S. manufacturing output (U.S. Department of Commerce 1994). Food processing shipments have increased steadily in the last decade, from $330 billion in 1987 to $404 billion in 1992 and $430 billion in 1994.[2] By contrast, on-farm cash marketing receipts from livestock and crops production totaled less than $200 billion (Economic Report of the President, 1995). In fact, the total value-added (revenues less cost of purchased materials and energy) of the three main industries in the food marketing system (food processing, food wholesaling and retailing, and food service) was $372 billion, over four times greater than the $84.6 billion contribution of farm output to gross domestic product.

The number of food processing establishments declined from 28,193 in 1972 to 20,583 by 1987. This decline seems to have halted, however. By 1992, the number of establishments had increased slightly, to 20,792. There has also been a slow longrun decline in the number of employees in the U.S. food processing industries—from 1.75 million in 1972 to 1.64 million in 1982. Since 1982, the number of employees has remained virtually static, with only small year-to-year fluctuations.

Trade in Processed Foods and Farm Commodities

The processed foods sector is much larger than the farm sector not only in total value of production, but in international trade as well.

[2]In processed foods terminology, the term "shipments" refers, not to international transport, but to the domestic transport of processed foods from production plants to all destinations, including wholesalers, retailers, other plants, and export facilities.

Yet Dayton and Henderson (1992) point out that, compared with trade in commodities ". . . agricultural economists have given relatively little attention to international trade flows in processed foods" (p. 1).

The generally accepted view of agricultural trade is told from a comparative advantage argument emphasizing abundant, fertile land and a favorable farm structure. In this model, national specialization results in the United States exporting corn and soybeans, while importing bananas and papayas. Processed foods are different. Technology, with highly differentiated foods branded and made convenient for consumers, adds many dimensions not captured by standard analysis of comparative advantage.

Great distinctions can be made between raw agricultural products and processed foods at the producer level and at the consumer level. First, the distance to consumers is much less for processed foods manufacturers than for agricultural producers. The farther along a product moves in time, space, and form away from the farmer, the closer its connection to the consumer. Perhaps the most apparent result is branded products, which are not supplied by any but the most vertically integrated farmers. Grains fit the comparative advantage model very well, grain mill products fairly well, meat products less well, and Big Macs not at all.

The link between processed foods manufacturers and consumers is fed by the high incomes and individualistic nature of American society. These are reflected in the entrepreneurial nature of U.S. business and highly developed consumer preferences. Technology, information, communications, and research and development have all played a part in making the United States a leader in the processed foods industries.

The higher the level of processing, the higher the level of product differentiation, thanks to a very sophisticated marketing research capability in the United States. Manufacturers are able to discover what consumers want and deliver it with the product characteristics that consumers prefer. And the more differentiated the product, the more complex the marketing and the less dependent consumer

choice on lower costs of production of the raw agricultural commodity. There are fewer distinctions to be made between brands of flour than among brands of bread, for instance. All other things being equal, the cheaper amber waves of wheat in Kansas than in Germany still matter. But other things are not equal, and U.S. processed foods industries are quite capable. In processed products, they may be able to overcome the cheaper waves of grain in Argentina than in Iowa.

Commodity trade has received much more attention than processed foods trade. The focus on raw products trade may derive from its close association with agriculture. The family farm, "amber waves of grain," the wholesomeness of rural communities — these are all notions that have become ingrained into the average citizen's picture of U.S. agriculture. Raw commodity exports have consistently generated positive trade balances since 1960. With so much attention paid to U.S. trade deficits during the past two decades, one would naturally expect that any industry consistently generating strong surpluses would be favorably received by the media and the U.S. population. Processed foods have only recently begun to generate trade surpluses. The attention paid to commodity exports is also likely due to the enormous growth of the grain trade in the 1970's. Grain companies and commodity producer associations publicize their high levels of grain exports, since farmers benefit from the higher prices that result from increased commodity exports. Finally, raw commodity trade accounted for the larger share of U.S. food and agriculture trade until recent years.

Whatever the reason for the fascination with commodity trade over processed foods trade, when presented side by side, the numbers are startling. In 1972, the value of world trade in agricultural commodities and processed foods across all countries was $65 billion, of which 42 percent was bulk commodity trade (fig. 1). By 1982, after what is generally regarded as a decade of enormous growth in commodity trade, the total value of commodity and product trade had more than tripled, to $201 billion. However, the commodities share of that total had decreased, to less than 40 percent. Between 1972 and 1993, the total value of international trade in processed food products climbed from $38 billion to $256

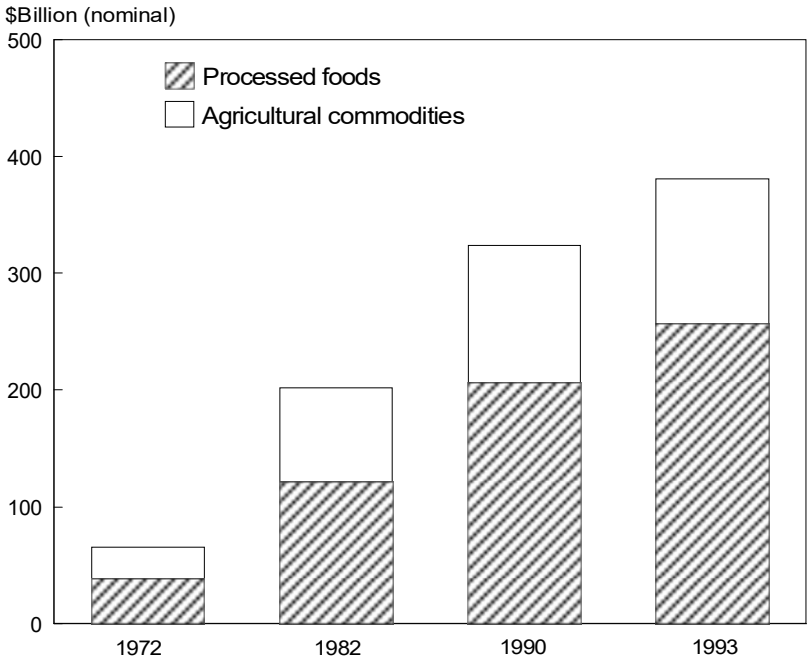
billion, an annual growth rate of 9.5 percent (Dayton and Henderson, 1992). In 1993 the global value of international trade in processed foods and beverages, constituted two-thirds of the $381 billion global trade in agricultural products and commodities (Henderson and Handy, 1994). Thus, processed food's share of global agricultural trade rose from 58 percent in 1972 to 67 percent in 1993.

The U.S. Role in International Processed Foods Markets

There are no data available on the total value of food processing shipments worldwide. However, the Organization for Economic Co-operation and Development (OECD) provides a Structural

Figure 1

World trade in agricultural commodities and processed foods, 1972-90



Source: Economic Research Service, USDA.

Analysis (STAN) industrial database. This internationally comparable time series currently covers 20 countries (19 OECD countries plus South Korea) for all manufacturing industries. Data for the food and beverage industry (reasonably comparable to the U.S. food processing industry) are consistently defined across all countries.

In 1992, the gross output of processed food for all 20 countries totaled $1.5 trillion (table 2). Output from the U.S. food processing industry (adjusted for international consistency) was valued at $384 billion, accounting for 26 percent of the OECD-plus-Korea (OECDK) total across all countries. Japan had the second largest food processing sector with shipments of $281 billion, followed by Germany, France, and the United Kingdom at $155 billion, $118 billion, and $93 billion, respectively. The U.S. food processing industry accounted for 13.5 percent of total U.S. manufacturing output, the same as the average for all OECDK countries. Food processing's share of total manufacturing output ranged from a high of 33.7 percent in New Zealand to a low of 8.9 percent in Japan.

Table 2—Output and employment in food processing, United States and OECD-plus-Korea, 1992

Region/country	Gross outpout (shipments)	Share of total manufacturing	Total employment	Gross output per employee
	$ billion	*Percent*	*Thousand*	*$1,000*
OECD plus Korea	1,502	13.5	8,199	183.2
United States	384	13.5	1,615	237.7
Japan	281	9.8	1,772	158.8
Germany	155	11.3	841	184.0
France	118	16.7	561	210.1
United Kingdom	93	16.3	559	165.6
Canada	39	14.8	223	177.1
Australia	26	20.8	188	137.3

Source: ERS tabulation of OECD data.

Food processing plants on average are larger in the United States than in other OECDK countries, and are also more capital intensive. Although the U.S. share of OECDK food processing output in 1992 was 26 percent, its share of food processing employment was only 20 percent. Labor productivity (output divided by employment) in the United States is approximately 30 percent greater than the OECDK average. Labor productivity in the U.S. food processing industry was approximately $238,000 per

Table 3—Country of headquarters and sales of the world's 50 largest food processing firms, 1993

Company	Headquarters	Processed food sales	Total company sales
		Billion dollars	
1. Nestle S.A.	Switzerland	36.3	39.1
2. Philip Morris/Kraft Foods	USA	33.8	50.6
3. Unilever	UK/Netherlands	21.6	41.9
4. ConAgra	USA	18.7	23.5
5. Cargill	USA	16.7	47.1
6. PepsiCo	USA	15.7	25.0
7. Coca Cola	USA	13.9	14.0
8. Danone S.A.	France	12.3	12.3
9. Kirin Brewery	Japan	12.1	12.1
10. IBP, Inc.	USA	11.2	11.7
11. Mars, Inc.	USA	11.1	12.0
12. Anheuser-Busch	USA	10.8	11.5
13. Montedison/Feruzzi/Eridania	Italy	9.9	12.3
14. Grand Metropolitan	UK	9.9	11.2
15. Archer Daniels Midland Co.	USA	8.9	11.4
16. Sara Lee	USA	7.6	15.5
17. Allied Domecq Plc	UK	7.2	7.2
18. RJR Nabisco	USA	7.0	15.1
19. Guinness Plc	UK	7.0	7.0
20. H.J. Heinz	USA	6.8	7.0
21. Asahi Breweries	Japan	6.8	6.8
22. CPC International	USA	6.7	6.7
23. Dalgety	UK	6.7	6.7
24. Campbell Soup	USA	6.6	6.6
25. Bass Plc	UK	6.6	6.6

Continued—

person in 1992 compared with $183,000 per person across all OECDK countries. Average labor productivity in the U.S. food processing industry was much higher than in most of the other major food processing countries: France ($210,000), Germany ($184,000), United Kingdom ($166,000), and Japan ($159,000). Because these numbers are averages that reflect the actual size and product mix of food processing plants in each country, they present a slightly distorted picture. Considering only the leading food processing firms in each country, one finds that these firms have access to the

Table 3—Country of headquarters and sales of the world's 50 largest food processing firms, 1993—continued

Company	Headquarters	Processed food sales	Total company sales
		Billion dollars	
26. Suntory Ltd.	Japan	6.6	6.6
27. Associated British Foods Plc	UK	6.5	6.5
28. Kellogg Company	USA	6.3	6.3
29. Hillsdown Plc	UK	5.8	6.0
30. Quaker Oats	USA	5.7	5.7
31. General Mills	USA	5.6	8.5
32. Tate & Lyle Plc	UK	5.6	5.6
33. Cadbury Schweppes	UK	5.6	5.6
34. Coca Cola Enterprises	USA	5.5	5.5
35. Seagram	Canada	5.2	5.2
36. Sapporo Breweries Ltd.	Japan	5.1	5.1
37. Borden, Inc.	USA	4.8	6.7
38. Nippon Meat Packers	Japan	4.8	4.8
39. Yamazaki Baking	Japan	4.8	4.8
40. Tyson Foods Inc.	USA	4.6	4.7
41. Heineken	Netherlands	4.6	4.6
42. United Biscuits	UK	4.5	4.5
43. Fosters Brewing Group LTD	Australia	4.4	4.4
44. Ajinomoto Co., Inc. Japan	Japan	4.3	5.3
45. Snow Brand Milk	Japan	4.3	4.8
46. LVMH Moet Hennessy	France	4.2	4.2
47. Besnier S.A.	France	4.1	4.1
48. Itoham Foods Inc.	Japan	3.9	3.9
49. Meiji Milk Products Japan	Japan	3.9	3.9
50. Hershey Foods Corp. USA	USA	3.5	3.5

same technology regardless where their plants are located. However, the OECD results are consistent with a study by McKinsey that found labor productivity in food processing during 1987-1990 to be 20 percent lower in Germany than in the United States and 67 percent lower in Japan (McKinsey and Company, 1993).

U.S. firms dominate the list of the world's 50 largest food processing firms (table 3). In 1993, the United States accounted for 6 of the world's 10 largest food processing firms and 21 of the 50 largest firms. The United Kingdom and Japan are second on this list, each with 10 firms listed among the top 50 food processing firms. Only 2 of the top 50 firms were headquartered outside the United States, Europe, or Japan — Seagrams in Canada and Fosters in Australia. Turnover among the top 50 firms is moderate. Seven firms that were on the 1989 list were not on the 1993 list.

In summary, the United States is a major player in international processed food markets. It is near or at the top in firm size, labor productivity, total production, and international trade.

Chapters 2 and 3 examine in much greater detail the levels and trends in U.S. exports and imports of processed foods and beverages, and the extent of inbound and outbound foreign direct investment. Prior to this more detailed analysis, however, comes an exploration of the impacts of the globalization of the processed foods market on particular individuals, groups, and sectors in the U.S. economy.

Implications of Globalized Food Markets for Consumers and Industry

Clearly, markets for processed foods are increasingly global in character, and they are not typified by small firms selling standard goods. Processed products are differentiated and are often branded, relatively few firms typically dominate individual product lines, and firms often realize increasing returns to size. Patterns of international trade in such "imperfectly competitive" markets vary

widely from the international trade in indifferentiated goods that characterizes trade in agricultural commodities. Many other global connections exist, including intra-industry trade (for example, the United States both imports and exports beef); trade in ingredients used for the manufacture of food products; production of foreign brands under license; joint ventures and co-packing arrangements between domestic and foreign food processors; and strategic alliances for assembling the latest in processing and packaging technology, product formulation, ingredient supply, and merchandising and distribution methods from around the world.

This variety in patterns of global commerce suggests a range of potential economic, social, and cultural impacts on both the originating and host countries (and on their consumers, laborers, capital owners, and businesses) that is much broader than the gains to trade traditionally recognized in conventional (neoclassical) economic thought. This section highlights the impacts of this eclectic pattern of globalization on consumers, on agricultural producers, and on food and agribusiness firms.

Consumers

International commerce in processed food is a win-win proposition for consumers: overall, consumers benefit both on the inbound side (imports and inward FDI) and on the outbound side (exports and outward FDI). Enhanced variety and selection are obvious benefits for consumers from inbound foreign commerce. For example, U.S. citizens routinely consume Mexican tortillas, Danish ham, Canadian bacon, Japanese sushi, Spanish tapas, Chilean fruits, German sausages, and Italian pasta. These are served with French wine, English ale, and Australian beer, and dinner is followed by Swiss chocolates, Dutch ice cream, and Colombian coffee. In similar fashion, foreign consumers enjoy a wide variety of American foods as a result of outbound commerce from the United States.

Some of these foreign foods are imported, and some are produced by U.S. firms under contract or license from foreign firms or by U.S. affiliates or subsidiaries of foreign firms. In the food service (restaurant) industry, virtually all inbound commerce is through

FDI, contract, or license. As in foods for home consumption, increased variety and selection are major benefits afforded consumers. Foreign food service firms provide U.S. consumers with a wide range of prepared eat-in or take-out foods, including such seemingly American product lines as Burger King, which is owned by Grand Metropolitan, PLC, in the United Kingdom or Dunkin' Donuts and Baskin-Robbins, both owned by Allied-Domecq in the United Kingdom.

Perhaps less transparent but of considerable importance are the competitive impacts of inbound commerce on the domestic food industry. Imported goods compete directly with other goods produced in the United States, as do foods that are produced here by affiliates of foreign firms or by domestic firms under contract or license with a foreign firm. This greater competition limits the ability of domestic food processors and retailers to increase food prices. Moreover, it also encourages domestic firms to innovate, both in terms of finding more cost-effective means of production and marketing, and in developing new and improved products that better meet consumer demands. Quantitative estimates of these pro-competitive impacts in specific markets have shown that gains from liberalizing international commerce due to increased competition are two to three times larger than gains from elimination of import tariffs (see, for example, Cox and Harris 1985 for Canada; Smith and Venables 1988 for the European Union).

Consumers can also benefit from outbound commerce. Gains can most easily be seen in the form of increased employment and income associated with exports of processed foods. Food processing is a "value-added" enterprise; workers add value to raw agricultural commodities through food manufacturing, packaging, distribution, retailing, and service functions. Typically, the greater the value-added component, the greater the employment share of total production expenditures and the higher the hourly wages. Thus the domestic work force, and thereby domestic consumers, benefit more in terms of employment and income when U.S. firms export value-added products, such as frozen apple pies, instead of apples. Value-added continues to increase for food products as the products move "down-stream" toward the final consumer, whether

domestic or foreign. There is also an income multiplier, that is, income earned by workers in the food system is spent in the local economy.

Consumer gains from outbound FDI and foreign production under U.S. license and contract are less clear, but are nonetheless real. To the extent that consumers are investors, their income is enhanced by dividends and other payments received as shareholders in a firm with profitable overseas operations. However, the potentially greater consumer benefits accrue from lower costs for domestic food products as a result of food manufacturers and distributors spreading their fixed costs over a larger volume by extending their operations overseas. That is, many firms can gain economies of size by expanding their operations abroad, thus lowering per-unit costs for products sold to domestic buyers as well as to foreign consumers.

Lower per-unit costs are also achieved through attributes and activities unique to a particular firm. Contemporary economic thought regarding multinational firms identifies the existence of firm-specific assets as a principal factor encouraging firms to develop foreign operations (see, for example, Dunning 1981, Ethier 1982, and Grossman and Helpman 1991). Firm-specific assets, sometimes equated with headquarter services, refer to unique advantages firms have created through intellectual activities. For example, firm-specific assets can include such things as innovative production and distribution methods, merchandising expertise, ownership of brand names with high consumer acceptance, unique product formulations, and special relationships with ingredient and commodity suppliers. Investment in firm-specific assets can be substantial, easily 15 to 20 percent of total assets for typical producers of branded food products, and sometimes as high as 30 to 40 percent (see chapter 4). Firms are motivated to expand the reach of their markets in order to spread their investment in firm-specific assets over a larger volume. Outbound investment and licensing for foreign production are ways of doing this. The result is lower total cost per-unit sold, which often yields lower consumer prices (Smith and Venables 1988).

It is in this phenomenon of firm-specific assets where global commerce in processed foods differs dramatically from international trade in agricultural commodities. Because agricultural commodities are undifferentiated and are sold in markets that closely resemble the textbook model of perfect competition, selling firms are typically not characterized by large investments in firm-specific assets and do not benefit from the resulting increase in returns to size. Thus, increased volume by expanding operations abroad is usually associated with constant or even increasing per-unit costs. In that case, foreign commerce can actually raise domestic prices. For processed foods, by contrast, per-unit costs can actually decline as a result of globalization of markets (Cox and Harris 1985).

Employment and Income

The labor force can also benefit from inbound commerce; most directly so in the case of inward FDI and domestic production under license and contract. Typically, inbound commerce occurs because a foreign firm discovers a way to expand the size of the domestic market through new and innovative products that attract new spending, or through more efficient processes that lower costs and thus increase effective consumer buying power. The result is greater employment and higher aggregate consumer income. Even when foreign direct investment involves the purchase of existing plant and equipment, the motivation for the acquiring firm is to exploit its product innovations or operating advantages in order to gain market share. This, in turn, often generates more aggressive marketing by domestic rivals, resulting in greater total market volume.

By contrast, there are often costs to employment and consumer income associated with food imports. To the extent that the competition from imported goods adversely affects production levels of domestically produced goods, the U.S. work force could suffer in terms of higher unemployment. This could also result in downward pressure on wages and, to the extent that either wages or hours decline, overall income levels could fall. However, because imports are only a small fraction of total inbound commerce in

processed foods, in the aggregate this effect is generally believed to be more than offset by gains associated with greater domestic employment generated by inbound FDI, and by contract and licensing operations of foreign firms.

Agricultural Producers

Producers of agricultural commodities are also subject to gains and losses from globalization of processed food markets. While the impacts of globalization on consumers are mostly positive, implications for agricultural producers are ambiguous. For the most part, producers as a group benefit from exports of processed foods and from inbound foreign direct investment. However, processed food imports and outbound FDI can generate both gains and losses to agricultural producers, the net effect of which is difficult to quantify.

Gains and losses from exports and imports of processed foods are relatively straightforward. If U.S. food manufacturers increase their exports of processed foods in response to increased demand by foreign consumers for American products, domestic production increases. The increased production of processed foods raises the demand by food manufacturers for the agricultural commodities used as ingredients. This, in turn, leads to an increase in total revenue in the commodity market, an outcome generally beneficial to producers.

Reversing this logic raises expectations that increases in U.S. imports of processed foods may reduce revenues to U.S. commodity producers. To the extent that imported foods displace domestic products in the consumer marketplace, the demand by food manufacturers for basic agricultural commodities declines, thereby lowering revenues to commodity producers. This is a clear case of producer loss.

It is virtually impossible to net out the overall effect of imports and exports of processed foods on commodity producers without a detailed case-by-case analysis. In general, however, because the annual values of U.S. imports and exports of processed foods are

roughly equal, the net impact may be relatively small. The trend in recent years toward faster growth in U.S. exports than in imports suggests, on balance, that U.S. trade in processed foods may be increasingly beneficial to the U.S. farm sector.

The effect of FDI on producers is even more difficult to evaluate. Inbound foreign direct investment is generally positive for commodity producers, especially to the extent that foreign investment adds to existing capacity for food manufacturing and distribution and uses local raw materials. Like their domestically owned competitors, U.S. affiliates of foreign food manufacturers and food service firms need agricultural commodities and intermediate ingredients as inputs. Thus, the addition of new facilities increases the overall demand for agricultural commodities, with corresponding benefits to producers.

When a foreign concern purchases existing facilities, producers could gain or lose. Positive outcomes could arise under two scenarios: (1) if the plant or firm had been a marginal producer that may have been closed had foreign interests not stepped in, and (2) if the foreign entity brings new product ideas or new production, merchandising, or distribution techniques that result in increases in processed food output. In both of these cases, the demand for agricultural commodities increases, or at the least a decrease is prevented, and agricultural producers benefit. On the other hand, producers could lose sales if the foreign investor closes some production facilities.

Contrary to the typical case for exports and imports, the expected impacts of outbound foreign production are not a "mirror image" of those for inbound foreign production. When U.S. firms invest in foreign operations, they often add a complement of U.S. ingredients to commodities purchased in the host country. This can increase demand for certain farm commodities either as direct ingredients or as inputs for semi-processed ingredients manufactured in the host country. This occurs because key domestic commodities or ingredients are considered essential to foreign manufacture of the American-style foods being produced and sold abroad. Indeed, as discussed earlier, contemporary explanations of the reasons firms

extend their operations abroad depend on their ability to expand the market for firm-specific advantages such as unique product characteristics and formulations. There are many examples: McDonald's world-wide use of Idaho potatoes for french fries; Ocean Spray's use of U.S. cranberry juice as a key ingredient in foreign-produced varieties of its fruit drinks; Coca-Cola's exports of cola syrup to foreign-affiliated bottlers; overseas shipments of U.S. citrus concentrate for use by foreign formulators of Sunkist soft drinks; and Hershey's delivery of U.S.-produced chocolate syrup for use in foreign production of its candy bars.

Agro-Industrial Firms

The agricultural and food system can be divided into six interrelated sectors of activity: supply of farm inputs, farm production, food processing/manufacturing, wholesaling, retailing, and food service. The implications of globalization in processed food markets on the first two of these sectors follows the discussion above for agricultural producers. In general, as agricultural producers benefit from increased volume, so does the farm supply sector.

In this section, implications for sectors "downstream" from farms are examined. These are the firms and industries most directly involved in commerce in processed foods. The term "downstream" is used to convey the sense of product flow through the value-adding chain, from production to final consumption. While each of the downstream sectors realizes some sector-specific impacts of the increasing globalization of the processed foods market, these sectors are affected the same in a number of ways. These common threads are discussed first, followed by some sector-specific implications.

Many downstream firms operate in markets that can be characterized as imperfectly competitive. In imperfectly competitive markets, the number of sellers is small enough relative to the size of the market that an individual firm may have some degree of market power over the selling price of its products. Firms typically gain market power by differentiating their goods and services from those of their rivals, thus using their firm-specific assets to create a unique

"consumer franchise." While firms can, and sometimes do, use such market power to raise prices and profits, strategies vary widely. Some firms concentrate more on expanding total sales, while some adopt low-price strategies to expand market share, and others emphasize the development of new products, innovative sales methods, or more efficient means of production or distribution. By contrast, perfectly competitive markets are those which have such a large number of (relatively small) participants that no one seller is able to individually affect price or total market volume.

Globalization affects the use of market power in a number of ways. First, foreign firms become competitors with home-market firms in supplying products to the domestic market. The presence of foreign firms increases the level of price competition, thereby limiting price increases and, in many cases, actually lowering product prices throughout the market. Second, it puts competitive pressure on home firms to find innovative ways to lower their costs. Third, less innovative or poorly managed firms that have been operating at the margin may be forced to leave the market, thus raising the overall efficiency of the entire industry. Fourth, as foreign firms bring different products to the market, home firms tend to expand their efforts in new product research and development, thus increasing even further the variety of products available in the domestic marketplace. In many cases firms discover new economies of scope as their range of products increases. By expanding the range of products sold, they spread their facilities, marketing, and management over a larger volume, thereby reducing per-unit costs.

In addition to economies of scope, firms in the processed food sector can benefit from the potential for economies of size and scale that increased globalization brings. When new markets are opened in foreign countries, increased production is needed at all levels in the processed food sector. Standard economic thinking holds that, in perfectly competitive markets, increased production is undertaken at increasing per-unit costs. However, when markets are imperfectly competitive, increased production of a given product may come at lower per-unit cost through economies of size and scale; for example, efficiencies gained from acquiring inputs in

greater quantities or more extensive utilization of existing production technology. Increased size contributes to more than just lower production costs. Typically, larger firms also have advantages in information gathering and processing, in transportation and distribution, and in research and development.

Additionally, firms in imperfectly competitive markets have an inherent potential for greater gains from free trade than do firms in the textbook version of perfectly competitive markets. This follows from the above: as demonstrated by Cox and Harris (1985) for North America and by Smith and Venables (1988) for Europe, globalization brings enhanced efficiency and innovation in imperfectly competitive markets, in addition to the traditional gains from trade associated with elimination of tariffs and other trade barriers in competitive markets.

Specific to U.S. agrofood firms, increased globalization offers another significant benefit — the potential to expand more rapidly than the rate of growth in the domestic market. The United States has perhaps the world's most advanced food system. It provides a bountiful supply of food at the lowest cost of any country in the world, measured on the basis of share-of-income spent. Most Americans have at their disposal a tremendous variety of food from which to choose. But, as a result, the U.S. processed foods market is among the world's most highly saturated. Because the U.S. market is so advanced, export and operating opportunities in other countries can be quite attractive to U.S. firms. Indeed, for the U.S. agrofood system as a whole, capitalizing on its competitive advantages in global markets is already a success story. An overview of each of the downstream sectors reveals both important common themes and some sector-specific implications.

Food Manufacturing

For the most part, the impacts of globalization on the food manufacturing sector parallel those for the system as a whole. Firms benefit directly from increased exports of processed foods and outbound FDI and contract operations, and experience increased competitive pressures from inbound operations and processed food

imports. In addition, they may benefit from access to imports of foreign food ingredients that allow them to expand their product lines.

The case for gains from exports and from outbound FDI, licensing and other contract operations is straightforward and needs no further elaboration. Some observers, however, have suggested that these are substitute strategies, that outbound FDI displaces product exports and thus is somehow less desirable. The actual relationship between U.S. exports and outbound FDI is explored in greater detail in chapter 4.

The impacts of imports and inbound direct foreign-controlled operations require more case-by-case assessment. Some product imports are direct substitutes for domestic production and compete with domestic manufacturers. On the other hand, some imports are complementary materials useful for further processing, allowing domestic food manufacturers access to ingredients not readily available at home, thus facilitating product innovation and product-line extensions.

Overall, the impacts of inbound foreign commerce are beneficial to the competitive health of the sector, although not all firms gain. In particular, those that have fallen behind in efficiency and product innovation may view inbound commerce as more of a curse than a blessing; some undoubtedly fail under the competitive pressure. Yet some domestic firms find inbound FDI to be an important means for accessing the operating capital, product innovation, and managerial expertise needed to revive an old, tired operation and become, once again, a progressive player at home. Others, particularly those with strong firm-specific assets, find competition by foreign manufacturers a challenging inducement to fight ever more aggressively for domestic market share.

Food Distribution

The food wholesaling and retailing sectors benefit substantially from both product trade and foreign operations. Wholesaling, almost by definition, is an industry that operates on volume. This

sector benefits from both imports and exports by having more product to distribute to retail outlets at home and abroad. In addition, inbound FDI increases volume — on the supply side for wholesalers when FDI is in food manufacturing and on the output side for FDI in food retailing. Outbound FDI by food retailers potentially increases foreign demand for U.S. manufactured food, which is also likely to increase volume for domestic wholesalers willing to extend distribution to support these retailers. Outbound FDI by manufacturers probably has little direct impact on home-market wholesalers, while inbound and outbound FDI by food wholesalers have competitive impacts on the sector similar to those in food manufacturing.

As food wholesalers make investments in firm-specific assets such as brand names, just-in-time inventory management systems, and merchandising expertise, the potential to gain size advantages from outbound foreign operations becomes even more similar to those in the food manufacturing sector. Although directly competitive inbound FDI in wholesaling could squeeze out less efficient, less progressive firms, it can also be a source of new performance-enhancing management, technology, and capital.

Food retailing also benefits from increased imports of processed foods, primarily in terms of greater product variety and lower prices. Overall, an increase in processed food exports would probably be neutral for domestic food retailers. There are some gains from lower processed food costs associated with increased size and scope economies in food manufacturing, but these may be offset by the impact of increased foreign demand on processed food prices.

The impacts of inbound and outbound FDI in food manufacturing on food retailing are essentially the same as for food wholesaling. Inbound FDI in wholesaling could benefit the retailing sector by bringing with it new services and/or more competitive pricing, while outbound FDI in the wholesale sector would have little direct impact on the domestic retailers. Inbound and outbound FDI in food retailing enhance competition within the sector, with firm-specific results similar to those in wholesaling and manufacturing. Casual observation, however, suggests that there may be less in the way of

cross-country management and technology transfer in food retailing due to country-specific idiosyncracies in consumer food shopping behavior.

Food Service

Globalization impacts in the food service industry are almost exclusively issues of direct foreign operations, either FDI or franchise contract-type operations. There is little international product trade in the sector, except in selected food ingredients and other supplies. Outbound food service operations increase exports of some ingredients and supplies. However, the overall impact is probably relatively small, primarily because labor comprises much of the variable costs of food service operations and, except for some personnel engaged in firm management, is supplied in the host country. Inbound direct operations may have similar, minor impacts on imports of some supplies. More significantly, foreign direct operations in food service tend to induce foreign direct operations in food manufacturing. The normal mode of operations is for food service firms to develop strong dependency relationships with specific food manufacturers. An example is the tie between McDonald's and Keystone Foods; as the former expands its direct operations to new foreign markets, the latter follows with new outbound FDI in meat processing.

The food service sector provides one of the clearest examples of American firms advancing their firm-specific advantages through outbound foreign operations. Much of what the major food service firms export is intangible: trademarks, logos, merchandising slogans, quick service techniques, product consistency, and the like. Indeed, from a U.S. perspective, it stands as an example of commercial success in merchandising "Americana." No other segment of U.S. industry, with the possible exception of commercial aircraft, has accomplished so much in terms of selling American ideas, know-how, and products abroad and creating value from these intangible assets, some of which flows back to the United States.

CHAPTER 2
U.S. Trade in Processed Foods

The United States is among the world leaders in both exports and imports of processed foods. Firms in the U.S. processed foods sector buy and sell in a near-trillion dollar worldwide market. The appeal of U.S. brand names, the influence of U.S. multinational firms abroad, and the leading role played by U.S. telecommunications systems help assure the United States of a leading role in processed foods trade. This section looks at the patterns and trends that developed during 1990-1994 in U.S. trade in processed foods, beginning with a few definitions and describing world trade patterns in processed foods. Then comes the USDA/ERS data set that is used in this report to analyze U.S. trade in processed foods. Finally, this section considers the trade numbers: what is traded, how much of it, and with whom.

World Trade in Processed Foods

Relatively little research has been undertaken on worldwide trade in processed foods. A paper by Dayton and Henderson provides the most detailed look at international trade in the sector. Their analysis used United Nations data over a 25-year period (1962-87) at 5-year intervals. The data were passed through a modification of the USDA/ERS concordance to transform the 360 U.N. food product categories in the U.N. data into four-digit and three-digit SIC-20 categories. The U.N. data included 232 trade-partner countries and were based on reported import values of 160 countries. The remainder of this section reviews highlights from Dayton and Henderson (1992).

As discussed in chapter 1, industrial countries are the leading importers and exporters of processed foods. The nations of Western Europe and North America, plus Japan, Australia, and New Zealand accounted for 87 percent of the $160.8 billion worldwide SIC-20 imports in 1987. These nations were less dominant on the supply side, accounting for only 57 percent of SIC-20 exports in the same

year. The United States was the leading importer, at $23.3 billion, followed by West Germany, Japan, the United Kingdom, France, and Italy, at $18.1, $17.3, $13.4, $13.2, and $12.8 billion, respectively. These six nations accounted for over 61 percent of processed food imports in 1987. The top exporting nations were the Netherlands, France, the United States, and West Germany, at $13.1, $12.1, $11.2, and $10.0 billion, respectively. These four nations supplied 29 percent of processed food exports in 1987. Lesser developed countries are more important as suppliers of processed food exports. Brazil was the fifth leading exporting nation, with China, Taiwan, and Thailand also among the top 15 exporters.

Miscellaneous food and kindred products (SIC-209), at $48.6 billion, accounted for 30 percent of the value of worldwide processed foods trade in 1987. This category includes fresh, canned, and frozen fish and seafoods, coffee, and other food preparations not listed elsewhere. Meat products (SIC-201) was the second largest product category, at 18 percent, followed by sugar and confectionery products (SIC-206) at 11 percent. Bakery products (SIC-205) and grain mill products (SIC-204) were the smallest categories, with a combined trade share of only 6.7 percent of the total.

As the world's leading importer of processed foods and beverages, the United States ranked first in 1987 value of imports in sugar and confectionery products (SIC-206), beverages (SIC-208), and miscellaneous (SIC-209); and second in preserved fruits and vegetables (SIC-205), and bakery products (SIC-203). The $10 billion in miscellaneous (SIC-209) imports amounted to 43 percent of the total U.S. processed food imports in 1987. This amount was nearly triple the value of beverage (SIC-208) imports, which was the second largest category. The United States is also the world's leading exporter in grain mill products (SIC 204), fats and oils (SIC-207), and miscellaneous (SIC-209). U.S. leadership in the first two categories is a direct result of the strength of the United States in worldwide grain and soybean production. That the United States should lead the world in both imports and exports of SIC-209

products is due primarily to a large amount of intra-industry trade (importing and exporting the same product) in fish and seafood.

U.S. Trade in Processed Foods

The USDA/ERS Processed Foods Trade Data Set

All goods that are traded across national boundaries are classified according to the international Harmonized System (HS). This system assigns 10-digit code numbers to products based on form and processing methods. The system was designed to replace individual nations' systems with commonly accepted nomenclature and descriptions of traded goods. The United States adopted the HS in 1989. HS codes are the basis for the Harmonized Tariff Schedule of the United States, wherein rates of duties on imports are published, and are used by the Bureau of the Census in its monthly import and export trade reports.

With respect to trade in processed foods, there are a number of features to highlight concerning this classification. First, sales from foreign affiliates of U.S. firms are not U.S. exports; data on foreign affiliate sales are discussed in chapter 3. These sales result from foreign direct investment. Likewise, products sold to U.S. citizens by foreign-owned firms operating in the United States are also excluded from trade figures. However, exports from foreign-owned plants operating in the United States are included in SIC-20 trade figures, as are imports of foreign products by U.S. and foreign-owned firms operating in the United States.

The USDA/ERS processed food trade data set is generated through a conversion of the HS product-based classification (as reported by the Census Bureau) into an SIC industry-based system. Each of the more than 2,000 HS codes for processed foods is paired through a concordance with a corresponding domestic industry among 48 SIC-20 industries designated by the SIC scheme.[3] The pairing

[3]Although the SIC lists 49 four-digit industries within the SIC-20, the USDA/ERS data set combines 2061 (cane sugar, raw) and 2062 (cane sugar, refined) into one cane sugar category and thus lists only 48 industries. See Epps and Harris (1995) for a more detailed explanation of the processed food trade concordance.

criterion matches the HS product descriptions to establishment activity and product line in the SIC system. The result of the pairing activity is a trade data set summarizing aggregate imports and exports for each of the 48 industries over each of the 200 processed foods trading partners of the United States. Because the Harmonized System was adopted in 1989, the first full year of annual data available through this concordance is 1990. Although data for prior years are available, they are not fully comparable. Thus, our analysis of patterns and trends of U.S. trade in processed foods uses five calendar years beginning with 1990.[4]

Patterns and Trends

The U.S. processed food sector in 1991 reached its first SIC-20 trade surplus. Annual deficits on the order of $5 billion in the mid-1980s had been reduced to $2 billion by the end of the decade. These decreasing deficits were being fueled mostly by rising export levels, which increased 97 percent between 1985 and 1991. Imports were also growing, but at a slower pace, increasing only 26 percent during this same time period. The group most responsible for the deficit turnaround was SIC-201 (meat products), which went from a $114 million deficit in 1985 to a $2 billion surplus in 1991. Other major contributors to the positive trade balance included SIC-204 (grain mill products) and SIC-207 (fats and oils), which averaged $2.4 and $1.7 billion trade surpluses, respectively, between 1985 and 1991.

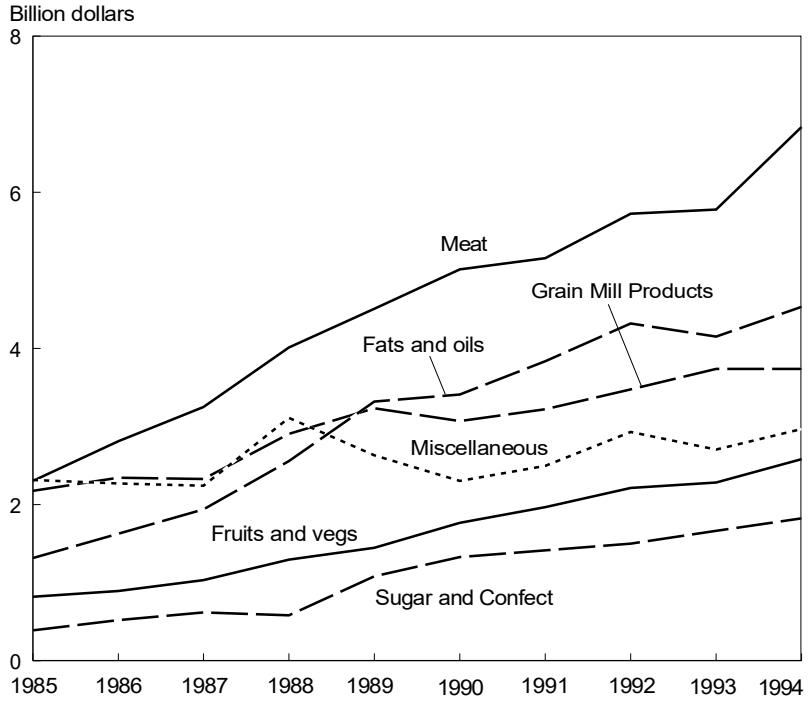
The leading three-digit export industry is meat products (SIC-201). With nearly $7 billion in exports in 1994 (figure 2), meat products constituted 26.5 percent of the total value of all SIC-20 exports. Other leading export industries included the miscellaneous category (SIC-209), with $4.5 billion, and grain mill products (SIC-204), with $3.7 billion in 1994 exports. At the four-digit level, five

[4]These data are not fully compatible with the Dayton and Henderson (1992) data used in the previous section. The ERS data set uses Census Bureau data and the electronic concordance described in Epps and Harris (1995). Dayton and Henderson used U.N. data tapes and a modified version of the ERS concordance. For the United States, the Dayton and Henderson numbers are larger in most categories.

industries—meat products, fresh seafood, wet corn milling, soybean oil, and poultry products — each averaged over $1 billion per year in export earnings between 1990 and 1994 (table 4). Together they accounted for just over half (50.1 percent) of total U.S. exports of processed foods and beverages. Meatpacking alone, at $22.4 billion, accounted for 20.2 percent. A third of the industries constituted over 80 percent of U.S. SIC-20 exports. The four-digit industries that realized the largest growth rates over the past few years were the lower trade volume industries. Those that doubled their exports in combined calendar years (CYs) 1993-1994 as compared to their combined CYs 1990-1991 totals included frozen bakery products, potato chips and snacks, chewing gum, frozen specialties, flour mixes and dough, soft drinks and carbonated water, and ice cream and frozen desserts, with fluid milk falling just short of the mark.

Figure 2

U.S. processed food exports, 1985-94



Source: Economic Research Service, USDA.

Table 4—U.S. exports of processed foods and beverages by 4-digit industry, 1990-1994

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2011	Meatpacking	4,154,300	4,120,520	4,578,670	4,479,735	5,062,587	4,479,163
2092	Fresh fish	2,396,592	2,569,968	2,860,303	2,532,852	2,585,624	2,589,068
2075	Soybean oil mills	1,457,687	1,613,570	1,836,708	1,657,729	1,706,678	1,654,474
2046	Wet corn milling	1,142,579	1,288,914	1,391,326	1,383,926	1,350,031	1,311,355
2015	Poultry dressing plants	717,365	879,078	990,854	1,156,227	1,635,756	1,075,856
2068	Salted and roasted nuts and seeds	682,770	737,563	776,439	848,821	954,197	799,958
2033	Canned fruit and vegetables	605,446	702,455	852,878	849,353	954,424	792,911
2044	Rice milling	774,368	709017	707,492	756,111	929,889	775,376
2099	Other food preparation	469,057	589,312	667,818	854,592	1,078,191	731,794
2077	Animal/marine fats and oils	544,370	577,814	77,577	637,182	745,419	636,473
2087	Flavorings, extracts, and syrups	445,056	497,036	553,738	649,810	729,598	575,048
2034	Dried fruit and vegetables	509,011	540,901	568,819	579,926	621,594	564,050
2048	Prepared animal feed	547,506	494,680	569,746	634,707	419,342	533,196
2037	Frozen fruit and vegetables	464,234	472,667	507,309	536,934	617,290	519,687
2023	Condensed and evaporated milk	228,705	379,164	498,596	629,201	522,439	451,621
2091	Processed fishery products	387,992	476,939	503,267	437,746	427,678	446,725
2041	Flour and grain mill products	277,916	313,508	334,930	392,279	386,054	340,938

Continued—

Table 4—U.S. exports of processed foods and beverages by 4-digit industry, 1990-1994—continued

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2085	Distilled and blended spirits	272,546	299,729	349,796	355,693	389,729	333,498
2066	Chocolate and cocoa products	237,649	239,825	294,732	397,789	383,293	310,658
2047	Dog, cat and other pet food	168,110	213,548	256,823	315,253	386,912	268,129
2082	Malt beverages	178,329	208,014	221,017	235,671	404,815	249,569
2076	Vegetable oil mills	167,617	191,715	283,709	258,824	320,110	244,395
2062	Cane sugar	226,285	235,324	171,754	124,262	173,235	186,172
2086	Soft drinks and carbonated water	105,928	133,610	173,281	196,757	320,959	186,107
2035	Sauces and salad dressings	131,617	164,852	183,160	191,033	235,843	181,301
2051	Bread and other	120,976	142,547	179,096	207,408	233,959	176,797
2084	Wines, brandy, and brandy spirits	133,814	156,326	183,963	184,303	201,718	172,025
2013	Sausage and prepared meats	149,713	157,469	159,916	145,713	143,205	151,203
2043	Breakfast cereals	114,086	150,583	150,772	160,851	151,456	145,550
2096	Potato chips	63,069	91,013	136,958	175,453	251,619	143,622
2064	Candy and confectionery products	97,326	111,167	150,377	168,738	165,155	138,552
2021	Creamery butter	111,212	45,417	158,346	182,126	107,709	120,962
2095	Roasted coffee	76,560	88,877	117,875	122,509	142,211	109,606

Continued—

Table 4—U.S. exports of processed foods and beverages by 4-digit industry, 1990-1994—continued

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2052	Cookies and crackers	55,488	72,258	98,902	107,824	106,623	88,219
2045	Blended and prepared flours	44,611	54,450	72,241	96,904	117,673	77,176
2063	Beet sugar	66,835	68,245	77,785	80,096	77,668	74,126
2079	Shortening and cooking oils	59,435	57,395	66,871	90,557	95,931	74,038
2074	Cottonseed oil mills	79,283	57,450	67,341	63,069	101,037	73,636
2032	Canned specialties	43,540	61,374	67,929	80,549	93,837	69,446
2024	Ice cream and frozen desserts	30,013	50,263	73,804	73,870	90,009	63,592
2026	Fluid milk	30,290	42,891	52,946	70,891	74,532	54,310
2022	Cheese, natural and processed	38,726	36,400	49,449	57,973	71,777	50,865
2067	Chewing gum	20,691	25,235	30,044	50,073	72,265	39,661
2038	Frozen specialties	16,697	25,600	37,182	49,308	61,250	38,008
2083	Malt	30,497	33,565	33,818	50,965	30,324	35,834
2053	Frozen bakery products, excl. bread	13,246	19,091	28,428	43,004	48,707	30,495
2098	Pasta products	13,803	22,965	30,621	29,614	39,098	27,220
2097	Manufactured ice	3,173	3,089	3,372	2,709	8,383	4,145
Total		18,706,119	20,223,390	22,838,778	23,386,921	25,827,836	22,196,608

Table 5—U.S. imports of processed foods and beverages

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2092	Fresh fish	4,269,855	4,540,766	4,624,363	4,838,358	5,504,833	4,755,635
2011	Meatpacking	3,024,323	2,976,639	2,766,975	2,927,054	2,821,000	2,903,198
2033	Canned fruit and vegetables	1,179,846	1,330,048	1,471,238	1,276,996	1,348,176	1,321,261
2085	Distilled and blended spirits	1,305,472	1,130,651	1,295,098	1,274,658	1,328,013	1,266,778
2084	Wines, brandy, and brandy spirits	1,129,384	1,093,382	1,345,413	1,150,797	1,270,163	1,197,828
2091	Processed fishery products	898,874	1,062,554	993,192	921,651	1,036,379	982,530
2082	Malt beverages	939,169	840,786	880,671	960,300	1,072,447	938,675
2076	Vegetable oil mills	657,628	713,595	959,464	841,790	1,025,898	839,675
2062	Cane sugar	867,606	733,522	720,142	682,731	707,029	742,206
2099	Other food preparation	598,300	688,232	735,724	653,709	869,424	709,078
2037	Frozen fruit and vegetables	951,505	618,496	637,309	615,727	671,559	698,919
2066	Chocolate and cocoa products	704,471	661,541	675,529	657,866	650,462	669,974
2022	Cheese, natural and processed	439,222	419,598	433,710	464,366	490,841	449,548
2068	Salted and roasted nuts and seeds	352,420	371,995	395,690	414,729	421,382	391,243
2023	Condensed and evaporated milk	327,104	273,915	340,270	295,098	354,202	318,118
2051	Bread and other	253,838	268,934	302,953	309,429	343,201	295,671

Continued—

Table 5—U.S. imports of processed foods and beverages—continued

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2064	Candy and confectionery products	207,556	235,819	296,753	261,864	298,011	260,000
2086	Soft drinks and carbonated water	191,201	219,587	227,772	249,929	320,106	241,719
2034	Dried fruit and vegetables	236,505	223,653	239,266	240,655	255,489	239,114
2035	Sauces and salad dressings	191,811	201,394	236,479	237,298	269,796	227,356
2046	Wet corn milling	204,244	198,686	239,844	234,924	255,996	226,739
2098	Pasta products	141,908	163,001	178,793	189,794	237,936	182,286
2095	Roasted coffee	149,725	126,828	142,326	144,792	216,852	156,105
2013	Sausage and prepared meats	133,244	147,973	149,127	138,607	154,847	144,760
2052	Cookies and crackers	97,537	108,838	118,604	145,726	170,880	128,317
2048	Prepared animal feed	98,639	102,560	100,194	122,121	157,635	116,230
2077	Animal/marine fats and oils	72,881	68,730	86,675	161,274	139,548	105,822
2044	Rice milling	73,872	84,050	95,129	110,662	134,401	99,623
2047	Dog, cat and other pet food	68,341	74,154	73,879	76,545	84,015	75,387
2043	Breakfast cereals	43,918	61,644	73,014	77,314	89,873	69,153
2087	Flavorings, extracts, and syrups	56,473	54,704	62,026	55,478	81,704	62,077

Continued—

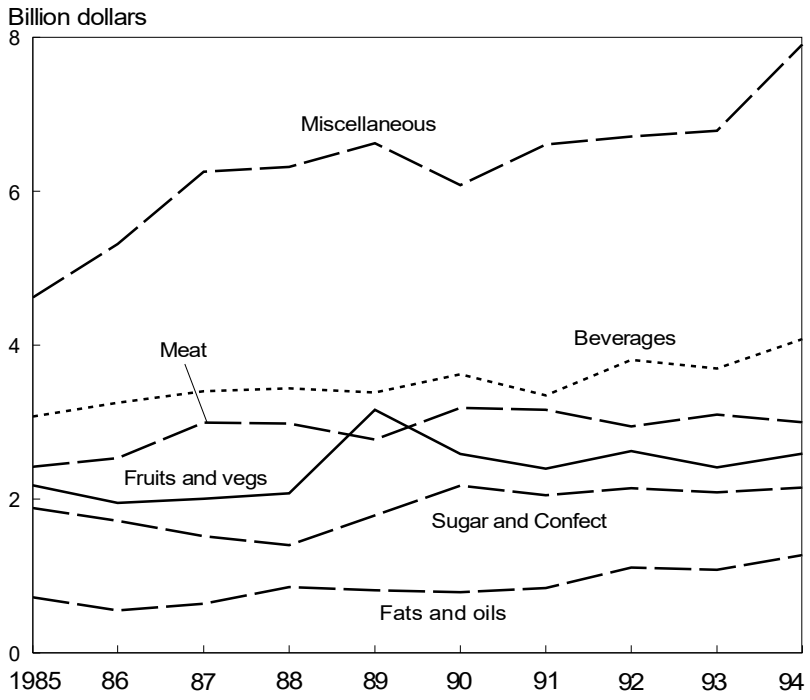
Table 5—U.S. imports of processed foods and beverages—Continued

Code	Description	1990	1991	1992	1993	1994	Average, 1990-94
				Thousand dollars			
2067	Chewing gum	41,095	44,204	55,289	68,956	71,150	56,139
2041	Flour and grain mill products	34,260	33,297	43,631	56,391	88,720	51,260
2079	Shortening and cooking oils	25,772	35,602	33,677	37,260	48,695	36,201
2075	Soybean oil mills	26,757	26,900	29,599	36,453	52,455	34,433
2032	Canned specialties	25,871	24,919	35,205	39,287	46,582	34,373
2015	Poultry dressing plants	29,674	35,528	25,705	29,889	25,426	29,244
2053	Frozen bakery products, excl. bread	10,668	15,868	23,414	37,946	43,512	26,281
2096	Potato chips	14,335	18,169	22,862	22,857	25,197	20,684
2045	Blended and prepared flours	10,105	10,517	16,858	21,292	27,633	17,281
2097	Manufactured ice	10,776	8,175	12,039	15,892	15,923	12,561
2026	Fluid milk	12,359	6,325	5,115	4,446	6,760	7,001
2083	Malt	6,414	4,672	3,012	8,348	12,557	7,000
2074	Cottonseed oil mills	6,828	678	4,541	7,440	7,970	5,492
2038	Frozen specialties	2,630	2,669	3,186	3,498	4,063	3,209
2021	Creamery butter	3,753	1,729	1,564	2,497	2,092	2,327
2063	Beet sugar	301	1,207	1,263	375	1,080	845
2024	Ice cream and frozen desserts	100	196	742	1,153	1,350	708
Total		20,128,570	20,066,926	21,215,326	21,126,222	23,263,264	21,160,061

On the import side, the leading three-digit industry is the miscellaneous category (SIC-209), with over $7.9 billion in 1994 imports (figure 3), over one-third of total 1994 U.S. processed food imports. Other leading import groups include beverages (SIC-208) and meat products (SIC-201), with $4.1 and $3.0 billion in imports in 1994, respectively. Five of the four-digit industries imported an average of $1 billion or more during 1990-94: fresh and frozen fish; meat packing; canned fruits and vegetables; distilled and blended spirits; and wines and brandy (table 5). Together these five constituted 54 percent of total U.S. processed food imports in 1994, with fresh fish alone accounting for 22.5 percent of the U.S. total. The top 12 four-digit industries accounted for more than 80 percent of all U.S. processed food imports. Lower trade volume industries were also the fastest growing on the import side. Those that more than doubled their imports during 1993-94 over 1990-91 included

Figure 3

U.S. processed food imports, 1985-94, largest 3-digit categories



Source: Economic Research Service, USDA.

ice cream and frozen desserts; frozen bakery products; flour mixes and doughs; flour and grain mill products; animal and marine fats and oils; and cottonseed oil.

The United States exports processed foods and beverages to nearly every country in the world. However, a relatively few countries account for the bulk of the business. During 1990-94, the United States exported an average of $22 billion in SIC-20 goods to 224 countries, including the 15 nations of the former Soviet Union.[5] Four countries bought an average of more than $1 billion per year in processed foods from the United States: Japan, Canada, Mexico, and South Korea (table 6). These four accounted for an average of 55 percent of total U.S. exports of processed foods and beverages during this period. Japan, at $5.9 billion annually, bought 26.7 percent of all U.S. SIC-20 exports. Nearly two-thirds of U.S. exports of processed foods to Japan during 1990-94 were from two industries, meatpacking at $2.0 billion and frozen fish at $1.8

[5]The 15 republics of the former Soviet Union have been listed as separate countries in the United Nations data since 1992, but were listed as one nation during 1990-92. Hence, the discussion of relative country export and import rankings during 1990-94 in this section combines the 15 nations into one "Former Soviet Union" (FSU) category.

Table 6—Largest export destination for U.S. processed foods, 1990-94

Country	1990	1991	1992	1993	1994	Average, 1990-94
			Thousand dollars			
Japan	5,247,278	5,259,828	6,218,628	6,145,694	6,712,943	5,916,874
Canada	2,689,903	3,116,331	3,334,836	3,635,962	3,916,290	3,338,665
Mexico	1,123,326	1,586,802	1,940,463	1,985,539	2,374,371	1,802,100
Korea, Rep.	1,180,713	1,186,436	1,229,843	1,130,194	1,285,969	1,202,631
Netherlands	787,330	806,396	802,769	732,919	785,204	782,923
Former Soviet Union	558,335	671,246	665,249	677,457	769,752	668,408
United Kingdom	459,092	530,805	675,225	667,385	673,947	601,291
Germany	475,343	507,360	527,312	549,810	531,599	518,285
Taiwan	370,348	454,996	472,348	527,380	666,500	498,314
Hong Kong	287,219	395,499	461,180	544,883	772,511	492,259
France	403,878	435,988	478,688	472,907	353,820	429,056
Saudi Arabia	266,350	280,138	307,590	315,257	320,815	298,030

billion. Canada, at $3.3 billion, was the second leading destination for U.S. processed foods. Like Japan, meatpacking and frozen and prepared fish, at $0.5 billion and $0.3 billion, respectively, were the leading export industries into Canada. However, these two industries constituted only 22 percent of total U.S. processed food exports to Canada. The top 10 countries accounted for more than 70 percent of total U.S. processed food exports. Three of the top 10 destination countries were newly industrialized countries in East Asia: South Korea, Taiwan, and Hong Kong.

Many of the fastest growing destinations for U.S. processed food exports are smaller, less-developed countries. Among all nations to which the United States exported at least $1 million in calendar

Table 7—Top five destination countries for U.S. processed foods exports, by 3-digit SIC code

Code	Country	Average, 1990-94	Percent	Cumulative percent
		$1,000		
201	Japan	2,236,974	39.2	39.2
201	South Korea	815,881	14.3	53.5
201	Mexico	696,703	12.2	65.7
201	Canada	653,804	1.5	77.2
201	Hong Kong	207,259	3.6	80.8
202	Mexico	156,857	21.2	21.2
202	Former Soviet Union	82,819	11.2	32.3
202	Japan	57,476	7.8	40.1
202	China (Taiwan)	54,951	7.4	47.5
202	Canada	54,476	7.3	54.8
203	Canada	559,786	25.9	25.9
203	Japan	493,862	22.8	48.7
203	United Kingdom	108,389	5.0	53.7
203	Mexico	91,425	4.2	57.9
203	Netherlands	87,187	4.0	61.9
204	Canada	467,576	13.5	13.5
204	Netherlands	411,970	11.9	25.5
204	Japan	174,697	10.9	36.3
204	Mexico	224,605	6.5	42.8
204	Saudi Arabia	142,280	4.1	47.0

Continued—

years 1990 and 1991 combined, the value more than doubled to 15 of them by 1993-1994. In order of percentage increases, these countries were: Albania, China, Somalia, Hungary, Argentina, Sudan, Poland, Tunisia, Kenya, Colombia, Guyana, Paraguay, Kuwait, Yemen, and Costa Rica. Albania went from $2.9 million in 1990-91 imports to $23.1 million in 1993-94, a 692-percent increase, while China increased 473 percent, from $63.3 million in 1990-91 to $362.7 million in 1993-94.

Table 7—Top five destination countries for U.S. processed foods exports, by 3-digit SIC code—continued

Code	Country	Average, 1990-94	Percent	Cumulative percent
		$1,000		
205	Canada	7,544	56.7	56.7
205	Mexico	28,555	9.7	66.4
205	Bermuda	575	6.3	72.6
205	Japan	10,422	3.5	76.2
205	United Kingdom	8,496	2.9	79.0
206	Canada	302,295	19.5	19.5
206	Japan	197,040	12.7	32.2
206	Germany	167,527	10.8	43.0
206	Mexico	136,427	8.8	51.9
206	Netherlands	76,938	5.0	56.8
207	Former Soviet Union	330,258	12.3	12.3
207	Mexico	273,488	10.2	22.5
207	Canada	261,002	9.7	32.2
207	Algeria	143,347	5.3	37.6
207	Japan	132,952	5.0	42.5
208	Japan	374,805	24.1	24.1
208	Canada	209,582	13.5	37.7
208	Australia	109,255	7.0	44.7
208	Mexico	106,231	6.8	51.5
208	United Kingdom	80,096	5.2	56.7
209	Japan	2,038,647	50.3	50.3
209	Canada	662,600	16.4	66.7
209	Korea, Rep.	162,169	4.0	70.7
209	United Kingdom	139,124	3.4	74.1
209	France	114,904	2.8	76.9

U.S. exports in a number of categories are heavily concentrated in a few countries (table 7). Within SIC-20 three-digit categories, the top five destination countries during 1990-94 accounted for 81 percent of SIC-201, meat products (Japan alone had 39 percent); 79 percent of SIC-205, bakery products (Canada had 57 percent); 77 percent of SIC-209, the miscellaneous category (with Japan at 50 percent); 62 percent of SIC-203, preserved fruits and vegetables (Canada and Japan combined had 49 percent); 57 percent of SIC-206, sugar and confectionaries; 57 percent of SIC-208, beverages; and 55 percent of SIC-202, dairy products. Canada was the leading destination in four three-digit categories, Japan led in three categories, and Mexico and the nations of the former Soviet Union each led in one category. Both Canada and Japan were

Table 8—Largest import sources of U.S. processed foods, 1990-94

Country	1990	1991	1992	1993	1994	Average, 1990-94
			Thousand dollars			
Canada	3,462,885	3,578,811	3,839,077	4,104,222	4,641,142	3,925,227
Thailand	881,111	1,203,613	1,324,563	1,391,886	1,713,373	1,302,909
Mexico	1,026,768	1,025,392	1,030,081	1,134,494	1,290,687	1,101,484
Australia	1,175,069	1,135,144	1,077,893	1,018,888	902,051	1,061,809
France	969,230	914,554	1,094,504	966,555	1,095,143	1,007,997
Brazil	1,164,426	757,348	827,747	804,045	763,982	863,510
New Zealand	829,174	874,499	840,528	808,159	778,545	826,181
Italy	741,239	758,878	885,041	804,588	933,193	824,588
United Kingdom	665,718	625,835	681,755	705,469	733,935	682,542
Netherlands	634,411	546,787	578,033	615,918	706,213	616,272
China	544,115	460,092	629,337	539,908	520,265	538,743
Germany	506,364	527,841	583,321	521,180	530,659	533,873
Philippines	481,476	492,704	625,558	500,301	503,912	520,790
Ecuador	393,693	469,972	467,831	477,065	589,981	479,709
Denmark	537,235	509,538	410,213	397,912	438,174	458,615
Spain	421,261	401,728	447,396	365,527	422,241	411,631
Argentina	390,413	510,360	440,922	341,478	348,365	406,308
Japan	352,190	343,305	343,966	351,681	379,132	354,055
India	268,978	277,518	282,746	372,765	492,613	338,924
Indonesia	223,759	289,596	342,547	285,657	363,761	301,064
Chile	229,563	263,733	300,022	313,325	372,361	295,801
Taiwan	311,407	300,013	285,836	281,652	294,492	294,680
Ireland	266,945	240,046	313,815	290,011	283,369	278,837

among the top five destinations in all nine three-digit categories, with Mexico in the top five in eight of the nine categories.

U.S. imports of processed foods are much more widely sourced (table 8). Canada, by far the leading origin of SIC-20 goods coming to the United States, commanded an 18.6-percent market share during 1990-1994, but Thailand, the second largest source for U.S. processed foods, had only a 6.2 -percent share. The top 10 source countries supplied 58 percent of U.S. imports. Three less developed countries were among the 10 leading U.S. import sources (Thailand, Mexico, and Brazil). The United States imported an average of $1 billion per year in processed foods during 1990-94 from 5 countries: Canada, Thailand, Mexico, Australia, and France.

Although in general U.S. imports are widely sourced, a number of three-digit categories are heavily concentrated with respect to sources (table 9). In 1994, the top five origin countries accounted for 82 percent of meat products (Australia and Canada combined had 51 percent); 82 percent of grain mill products (with Canada at 48 percent); 73 percent of fats and oils (Canada, Italy, and the Philippines combined had 60 percent); 71 percent of beverages (with France, Canada, and UK combined at 53 percent); 69 percent of bakery goods (with Canada at 40 percent); and 62 percent of dairy products. Canada was the leading nation in four categories and was among the top five sources of U.S. imports in three other categories. No other country led in more than one category; no other country was among the top five origins in more than three categories; and no less than 22 countries appeared as a top-five source in at least one three-digit category.

Intra-Industry Trade

The evaluation of U.S. exports and imports of processed foods indicates that the United States plays a major role in the global market as both an exporter and importer of processed foods. Examining each of the 48 industries classified by 4-digit SIC shows that the simultaneous export and import of processed foods, or intra-industry trade (IIT), also occurs at further levels of disaggregation (table 10). In 1994, Grubel-Lloyd (GL) indices

exceeded 0.5 for 26 industries.[6] A rough translation of this is, more than 50 percent of the U.S. trade in these 26 industries can be classified as intra-industry. Given that the volume of U.S. trade for 23 of these 26 industries exceeds $100 million a year, this phenomenon is present in a substantial portion of U.S. processed food trade. Across all 48 industries, the trade-weighted average of intra-industry trade in processed foods was 57 percent for 1994.

[6]The Grubel-Lloyd index is defined as: [(X+M) - |(X-M)|] / (X+M) where X = exports and M = imports of similar products. Therefore, GL = 1 implies pure intra-industry trade (or total overlap between exports and imports); GL = 0 implies no intra-industry trade (Grubel and Lloyd, 1975).

Table 9—Top five source countries for U.S. processed foods imports, by 3-digit SIC code

SIC code	Country	Average, 1990-94	Percent	Cumulative percent
		$1,000		
201	Australia	783,573	25.5	25.5
201	Canada	778,246	25.3	50.8
201	New Zealand	527,616	17.1	67.9
201	Denmark	266,492	8.7	76.6
201	Argentina	157,458	5.1	81.7
202	New Zealand	133,603	17.2	17.2
202	Ireland	124,018	15.9	33.1
202	Italy	104,377	13.4	46.5
202	France	74,015	9.5	56.1
202	Denmark	43,732	5.6	61.7
203	Mexico	326,439	12.9	12.9
203	Brazil	307,178	12.2	25.1
203	Spain	228,227	9.0	34.1
203	Thailand	210,498	8.3	42.5
203	Canada	158,549	6.3	48.8
204	Canada	314,989	48.0	48.0
204	Thailand	108,686	16.6	64.6
204	Germany	50,073	7.6	72.3
204	Netherlands	35,844	5.5	77.7
204	Australia	26,536	4.0	81.8
205	Canada	183,025	40.6	40.6
205	Denmark	48,917	10.9	51.5
205	Mexico	30,266	6.7	58.2

Continued—

The large amount of intra-industry trade found in 4-digit SIC processed foods industries suggests that U.S. trade in these goods is not based solely on differences in resource endowments. Trade based on differences in resource endowments results in countries exporting goods produced with resources that are relatively abundant, while importing goods that are produced using relatively scarce resources. Thus, countries would not simultaneously export and import within the same industry.

Despite this evidence to the contrary, discussions of agricultural trade often emphasize the role of U.S. endowments—land, labor, capital—in determining trade. For example, trade in agricultural products is often attributed to the abundant, fertile land, the climate, and a favorable farm structure in the United States. Such an

Table 9—Top five source countries for U.S. processed foods imports, by 3-digit SIC code —continued

SIC code	Country	Average, 1990-94	Percent	Cumulative percent
		$1,000		
205	United Kingdom	23,090	5.1	63.4
205	Germany	22,564	5.0	68.4
206	Brazil	312,007	14.7	14.7
206	Canada	251,768	11.9	26.6
206	India	133,813	6.3	32.9
206	Philippines	117,998	5.6	38.5
206	Dominican Rep.	105,513	5.0	43.4
207	Canada	279,194	27.3	27.3
207	Italy	178,979	17.5	44.8
207	Philippines	165,823	16.2	61.1
207	Malaysia	98,511	9.6	70.7
207	Peru	35,212	3.4	74.2
208	France	811,845	21.9	21.9
208	Canada	608,487	16.4	38.2
208	United Kingdom	520,195	14.0	52.2
208	Netherlands	356,594	9.6	61.8
208	Italy	344,714	9.3	71.1
209	Canada	1,331,094	19.5	19.5
209	Thailand	940,063	13.8	33.3
209	Ecuador	432,694	6.3	39.7
209	China (Mainland)	377,516	5.5	45.2
209	Mexico	347,341	5.1	50.3

explanation of trade misses the important differences between raw agricultural products and processed foods and the effect of these differences on trade.

Processed foods are different from raw agricultural products. Technology, highly differentiated foods branded and made convenient for consumers, and the market structure of many of the industries add dimensions that are not captured by focusing solely on a nation's natural endowments. In general, processing an agricultural product provides opportunities to differentiate products. Higher levels of processing provide greater opportunities for differentiation. For example, there are fewer distinctions to be made between brands of flour than among brands of bread.

Table 10—Intra-industry trade in processed foods (1994)

SIC category	Imports	Exports	Grubel-Lloyd index
	- - - Million dollars - - -		
Soft drinks and carbonated water	320.11	320.96	.9987
Chewing gum	71.15	72.26	.9922
Sausage and prepared meats	154.85	143.20	.9609
Frozen fruits and vegetables	671.56	617.29	.9579
Frozen bakery goods, exc. bread	43.51	48.71	.9437
Sauces and salad dressings	269.80	235.84	.9329
Other food preparations	869.42	1078.19	.8928
Canned fruits and vegetables	1348.18	954.42	.8290
Bread and other bakery goods	343.20	233.96	.8107
Condensed/evaporated milk	354.20	522.44	.8081
Roasted coffee	216.85	142.21	.7921
Cookies and crackers	170.88	106.62	.7684
Breakfast cereals	89.87	151.46	.7448
Chocolate and cocoa products	650.46	383.29	.7416
Meat packing	2821.00	5062.59	.7157
Candy and confectionery goods	298.01	165.15	.7132
Manufactured ice	15.92	8.38	.6898
Shortening and cooking oils	48.70	95.93	.6734
Canned specialties	46.58	93.84	.6635
Prepared fresh or frozen fish	5504.83	2585.62	.6392
Salted/roasted nuts and seeds	421.38	954.20	.6127
Malt	12.56	30.32	.5857
Processed fish products	1036.38	427.68	.5842
Dried fruits and vegetables	255.49	621.59	.5826

Continued—

The factors that distinguish processed foods from raw agricultural products also may explain the level of intra-industry trade. Intra-industry trade is more likely to occur when product differentiation, consumer demand for variety, imperfect competition, economies of scale in processing, or similarity in tastes among consumers in different countries exist (see, for example, Krugman, 1979, Helpman, 1981, and Helpman and Krugman, 1985).

Because of difficulties in constructing unambiguous measures of the above factors, most researchers have sought to verify the

Table 10—Intra-industry trade in processed foods (1994)—continued

SIC category	Imports	Exports	Grubel-Lloyd index
	- - - Million dollars - - -		
Malt beverages	1072.45	404.82	.5481
Prepared animal feed	157.64	419.34	.5464
Vegetable oil	1025.90	320.11	.4756
Distilled and blended spirits	1328.01	389.73	.4538
Refined cane sugar	707.03	173.24	.3936
Blended and prepared flours	27.66	117.67	.3806
Flour and grain mill products	88.72	386.05	.3737
Dog, cat and other pet food	84.01	386.91	.3568
Wet corn milling	256.00	1350.03	.3188
Animal/marine fats and oils	139.55	745.42	.3154
Dry pasta	237.94	39.10	.2823
Wines, brandy, brandy spirits	1270.16	201.72	.2741
Cheese	490.84	71.78	.2552
Rice milling	134.40	929.89	.2526
Flavorings, extracts, and syrups	81.70	729.60	.2014
Potato or corn chips and similar	25.20	251.62	.1820
Fluid milk	6.76	74.53	.1663
Cottonseed oil	7.97	101.04	.1462
Frozen specialties	4.06	61.25	.1244
Soybean oil	52.46	1706.68	.0596
Creamery butter	2.09	107.71	.0381
Poultry	25.43	1635.76	.0306
Ice cream/frozen desserts	1.35	90.01	.0295
Beet sugar	1.08	77.67	.0274

Source: ERS processed foods trade data base and author's calculations.

determinants of intra-industry trade by focusing on more general hypotheses. Roberts (1995) summarizes several of these hypotheses as follows: 1) Intra-industry trade (IIT) will be higher in the exchange of manufactured goods than in the exchange of primary goods; 2) IIT will be greater for countries with similar resource endowments than for countries with dissimilar resource endowments; 3) IIT will be greater among developed market economies than between developed market economies and less developed countries; 4) IIT will be greater between countries in close geographical proximity than between countries separated by long distances; 5) IIT will be greater between countries that both participate in some form of integration arrangement (e.g., NAFTA or the EU) than in countries that are nonparticipants in the arrangement. A closer examination of the ERS/USDA data on processed foods provides some insight on whether these generalized theories apply to processed foods defined at the 4-digit level.

Table 10 presents the most frequently used measure of intra-industry trade, the Grubel-Lloyd index. In the current context, it measures the absolute value of the overlap between U.S. exports and imports in each 4-digit industry. It can also be used to measure intra-industry trade between the U.S. and individual countries or regions.

Interpretation of the Grubel-Lloyd index depends on correct definition of the industry and appropriate adjustments for the impact of seasonal trade. An overly broad industry definition results in the comparison of trade in products that are not similar and therefore, overstates the amount of intra-industry trade. Seasonal trade, or exporting a food product during one season and importing it during another, also overstates intra-industry trade, because export and import of the good do not occur simultaneously.

The impacts of there considerations on the Grubel-Lloyd index for 4-digit SIC processed foods cannot be ascertained directly. Several studies of intra-industry trade in processed foods have suggested that these are not of great concern when broader industry definitions are used. Therefore, the following analysis assumes the

4-digit SIC industries are generally appropriate for evaluating intra-industry trade within the processed foods sector.

Defining groups of industries according to ranges in the Grubel-Lloyd measure provides some evidence that the degree of processing is related to the level of intra-industry trade (table 11). For the most part, the group of industries with a Grubel-Lloyd index greater than 0.8 contain more industries with a greater level of processing than the group of industries with a Grubel-Lloyd index of less than 0.2. This is also true if industries with a Grubel-Lloyd index of 0.5 and above are compared with those below 0.5. For example, the Grubel-Lloyd indices for rice milling, corn milling, flour, and vegetable oil—industries that provide a relatively small amount of processing—fall below 0.5.

The prevalence of more processed products in the group with high Grubel-Lloyd indices does not imply that industries with less processed, more homogenous, products are not part of this group. For example, canned fruit and vegetable products, much of which is in institutional-size containers for further processing and/or packaging, has a Grubel-Lloyd index of 0.83. This could represent an anomaly present in intra-industry trade in processed foods or, alternatively, it could be the result of the measurement error discussed above. Without further information, it is impossible to reach a definitive conclusion on this issue.

Grouping the data into regions allows for an evaluation of the impact of regional differences on intra-industry trade. Table 12 contains calculations of the Grubel-Lloyd measure for 4-digit SIC industries for four regions: the NAFTA countries (Canada and Mexico); the European Community; South America; and a group of Asian countries (Japan, Malaysia, Singapore, Taiwan , and South Korea).

Among the regions, the level of U.S.-regional intra-industry trade can vary widely. The Grubel-Lloyd index varies by as little as 0.1 among the regions for only two industries—Poultry and Milled Rice. In three industries—Meatpacking, Cottonseed oil, and Manufactured ice—the difference in the level of intra-industry

trade among regions exceeds 0.85. For most industries, however, the fluctuations in the level of intra-industry trade are less extreme.

Looking across regions, intra-industry trade is more commonly found in U.S.-NAFTA trade. The Grubel-Lloyd index exceeds 0.5 for 28 industries in U.S.-NAFTA trade. By comparison, the Grubel-Lloyd exceeds 0.5 for 15 industries in U.S.-EU trade; 11

Table 11—Industries categorized by level of intra-industry trade

Grubel-Lloyd > 0.8	**Grubel-Lloyd < 0.6 and > 0.4**
Soft drinks and carbonated water	Malt
Chewing gum	Processed fish products
Sausage and prepared meats	Dried fruits and vegetables
Frozen fruits and vegetables	Malt beverages
Frozen bakery goods, exc. bread	Prepared animal feed
Sauces and salad dressings	Vegetable oil
Other food preparations	Distilled and blended spirits
Canned fruits and vegetables	
Bread and other bakery goods	**Grubel-Lloyd < 0.4 and > 0.2**
Condensed/evaporated milk	Refined cane sugar
	Blended and prepared flours
Grubel-Lloyd < 0.8 and > 0.6	Flour and grain mill products
Roasted coffee	Dog, cat and other pet food
Cookies and crackers	Wet corn milling
Breakfast cereals	Animal/marine fats and oils
Chocolate and cocoa products	Dry pasta
Meatpacking	Wines, brandy, brandy spirits
Candy and confectionery goods	Cheese
Manufactured ice	Rice milling
Shortening and cooking oils	Flavorings, extracts, and syrups
Canned specialties	
Prepared fresh or frozen fish	**Grubel-Lloyd < 0.2**
Salted/roasted nuts and seeds	Potato or corn chips and similar
	Fluid milk
	Cottonseed oil
	Frozen specialties
	Soybean oil
	Creamery butter
	Poultry

Source: Author's calculations; ERS processed foods trade data base.

industries in U.S.-Asian trade; and 8 industries in U.S.-South American trade. At the other end of the spectrum, the Grubel-Lloyd index is below 0.2 for only 9 industries in U.S.-NAFTA trade; 24 industries in U.S.-EU trade; 25 industries in U.S.-Asian trade; and 33 industries in U.S.-South American trade. These findings suggest that geographical proximity and/or participation in an integration arrangement (NAFTA) are positively related to intra-industry trade.

Comparison across regions also reveals that U.S. intra-industry trade in processed foods is more common in regions with similar factor endowments and/or similar economies. Excluding NAFTA, the region most similar to the United States in terms of endowments and development of its economy is the EU, followed by Asia, and finally South America. The preceding description places countries along a similar continuum according to the prevalence of intra-industry trade in the processed foods industries. Intra-industry trade is more common in U.S.-EU trade than in U.S.-Asian trade and is least common in U.S.-South American trade.

Factors Affecting the Growth in Trade of Processed Foods

U.S. exports and imports of processed foods have risen considerably over the past few years. Many factors affect the rate at which import and export levels grow. A number of fairly general factors affect trade between nations in practically any product or service. These general factors are covered first in this section. Although the presentation is general, the examples focus mostly on processed foods. Government policies also affect trade levels, either explicitly through international commercial policies or indirectly by affecting the competitive positions of domestic firms and industries. The ways in which government policies affect trade levels is the topic of the second half of this section. Private and public institutions that influence trade levels are also reviewed. Finally, factors more specifically related to trade in value-added and brand name products are also examined. Factors that affect trade levels and trade flows in these heterogeneous products are

very different from the determinants of trade in raw agricultural commodities.

A number of economic factors affect international trade levels and flows, and these factors are discussed at two levels. The first concern is whether a particular factor makes a U.S. food manufacturer more or less competitive compared with producers in other countries. For example, it may be that the high cost of raw

Table 12—U.S. Intra-industry trade (Grubel-Lloyd index) with selected regions

SIC	NAFTA[1]	European Union[2]	Asian Group[3]	South America[4]
		Index		
2011 Meatpacking	.89	.77	0	.12
2013 Sausage	.52	.64	.56	.20
2015 Poultry meat	.05	.05	.01	0
2021 Butter	.04	.33	0	0
2022 Cheese	.38	.01	0	.56
2023 Dry/condensed dairy	.32	.13	.03	.01
2024 Ice cream	0	.18	.01	0
2026 Fluid milk	.03	.71	.01	0
2032 Canned specialties	.69	.28	.30	.26
2033 Canned fruits and vegetables	.56	.71	.43	.16
2034 Dried fruits and vegetables	.31	.17	.21	.25
2035 Pickled fruits and vegetables	.86	.66	.84	.48
2037 Frozen fruits and vegetables	.56	.13	.02	.03
2038 Frozen specialties	.04	.67	.78	0
2041 Grain mill products	.93	.06	.09	.05
2043 Breakfast cereals	.89	.75	.15	.15
2044 Rice milling	.05	.09	0	.01
2045 Prepared flour mixes	.60	.17	.02	.01
2046 Wet corn milling	.69	.17	.03	.18
2047 Dog and cat food	.50	.02	0	.06
2048Prepared animal feeds	.90	.37	.15	.08
2051 Bread/bakery products	.91	.16	.64	.33
2052 Cookies and crackers	.96	.14	.50	.95
2053 Frozen bakery products	.96	.59	.85	.04
2062 Cane sugar	.91	.51	.85	.30
2063 Beet sugar	.50	0	0	0
2064 Candy	.95	.28	.86	.21
2066 Chocolate products	.99	.13	1.00	.16

—continued

material inputs puts U.S. manufacturers at a disadvantage with respect to foreign producers. The second concern is whether a particular factor makes goods destined for foreign markets more or less expensive than identical goods consumed domestically. That is, the cost of transporting boxed beef from Iowa to Japan is greater than the cost of shipping the beef to San Francisco. Some factors will be advantageous or disadvantageous on both counts, as for example, when a low-cost exporter specializes in a product destined only for overseas markets.

Table 12—U.S. Intra-industry trade (Grubel-Lloyd index) with selected regions—continued

SIC	NAFTA[1]	European Union[2]	Asian Group[3]	South America[4]
		Index		
2067 Chewing gum	.65	.94	.33	.74
2068 Nuts and seeds	.39	.05	.24	.04
2074 Cottonseed oil	0	.38	0	.92
2075 Soybean oil	.14	.19	.06	.06
2076 Peanut/olive/other oils	.49	.31	.57	.71
2077 Animal fats and oils	.37	.04	.11	.82
2079 Margarine	.98	.29	.14	.96
2082 Beer	.25	.19	.20	.14
2083 Malt	.97	.79	.02	0
2084 Wines	.36	.11	.34	.12
2085 Distilled liquors	.12	.31	.05	.09
2086 Soft drinks	.98	.05	.22	.52
2087 Flavoring extracts/syrups	.30	.51	.08	.14
2091 Canned fish/seafoods	.76	.44	.98	.05
2092 Prepared fish/seafoods	.38	.60	.35	.01
2095 Roasted coffee	.83	.15	.05	.02
2096 Snack foods	.61	0	.07	0
2097 Manufactured ice	.26	.99	0	0
2098 Pasta	.86	.02	.10	.19
2099 Other	.63	.83	.40	.58

Source: Author's calculation; ERS processed foods trade data base.

[1]Canada and Mexico.

[2]EC-12

[3]Japan, Taiwan, Singapore, S. Korea, Malaysia.

[4]Argentina, Brazil, Paraguay, Uruguay, Bolivia, Colombia, Ecuador, Peru, Venezuela, Chile.

At the most fundamental level, trade between nations occurs because consumers in one country can purchase a particular product more cheaply from abroad than from domestic producers. The relevant comparison in this case is the consumer purchase price of two very similar products, one foreign and one domestic. A number of items contribute to the purchase price, some of which affect the prices of goods going to foreign markets more than goods that are consumed domestically. These latter items are covered following a brief discussion of some general factors that affect product price levels irrespective of the market destination. Transportation costs are the topic of chapter 5, and the costs of regulatory compliance are considered in chapter 7.

Production Costs

The roots of international trade theory lie in the theory of comparative advantage, which holds that differences in relative production costs of two goods between two potential trading nations can result in advantageous trade for both nations. In two-country, two-good barter trade, one nation's relative cost of one good is the inverse of its cost of the other good. Hence, each nation will have a relative cost advantage (a "comparative" advantage) in one of the goods, unless the relative costs of the two goods are identical between the two nations. If each nation specializes in the production of the one good in which it has a comparative advantage and trades this good in exchange for the other nation's specialization, global production and consumption possibilities increase. Thus, one nation produces and exports one good and the other nation produces and exports the second good. Although the theory of comparative advantage is set forth in a two-country, two-good context, it is intuitively straightforward to extend the theory to many nations and many goods.

The theory of comparative advantage is based on production costs. The costs of production, in turn, are based on the costs of the inputs used in the production process, the available technology, and the management expertise that brings the production process together (the efficiency of the process). The focus in the rest of this section is only on input costs, since technology and management issues are

topics geared more to an industrial management context and are covered later in discussions of foreign direct investment. Economists have traditionally recognized three groupings of inputs commonly known as the "factors of production": land, labor, and capital. Each of these is covered in turn, with a focus on how the prices of these inputs affect the competitive position of the United States in processed foods.

Land

Land includes the "God-given" resource endowments that the earth provides. These endowments include land that is productive in and of itself (for timber, agricultural, or recreational uses, etc.); raw materials that are extracted from the earth and water; and land as real estate that supports factories and office buildings. Unprocessed agricultural commodities are major inputs to processed foods, so productive land is fundamental to the processed foods sector. Fertile land is abundant in the United States, and the United States is a world leader in overall agricultural production and trade.

Because U.S. farmland is so productive and because U.S. income levels are relatively high, land in the United States is relatively expensive. These high ownership costs (or "rents") paid for land and buildings also put U.S. food manufacturers at some disadvantage relative to many other food processing nations, with Japan and Western Europe being the notable exceptions. However, the contribution of land to overall costs is probably small for most food processing industries.

The net impact of the various land items on processed food production costs probably yields a strong competitive position for most U.S. food manufacturers relative to other exporters (when only land as an input is considered). This result obtains primarily from the low costs of unprocessed farm commodities, with high land rents and raw materials costs constituting a relatively small portion of land-related production costs for most food manufacturing industries.

Labor, Technology, and Productivity

Labor is a high-cost item in the United States. Wage and benefit packages in the United States are among the highest in the world. Many U.S. jobs have already been lost to Mexican, Caribbean, and East Asian workers because of lower wages elsewhere, especially in textiles, electronics, and small manufactures. A large quantity of those products comes back into the United States as imports, resulting in a great deal of public consternation about "cheap labor" imports. Food manufacturing has largely been spared the loss of jobs to external outlets because of the relatively low cost of raw commodities, as noted above.

However, U.S. food processors still must compete in a global market with producers from other nations, where relatively inexpensive labor can offset higher raw commodity prices.

One of the reasons for high labor earnings in the United States is higher productivity levels for U.S. workers than workers in many other industrialized countries. This is due primarily to a high level of technology that results in a high level of mechanization in U.S. industry. This high level of mechanization is especially evident at the farm level, where capital-intensive methods lower overall commodity costs, and in the food processing industry, where assembly line methods in factory-like settings also generate high levels of output per worker.

Labor costs are a large component of the overall value added by the U.S. food processing sector. Total U.S. consumer expenditures for food in 1993 amounted to $491 billion. Farmers received approximately 22 percent of this, $109 billion. Of the remaining $382 billion, labor accounted for over 46 percent, at $178 billion (U.S. Department of Agriculture 1994A). Because these figures include retail and food away from home, the overall labor component in food processing is not as high a percentage. However, labor still ranks as the largest cost item in U.S. food processing. Thus, to the extent that the United States is at a competitive disadvantage in a particular food export market due to high production costs, high labor cost is likely to be a major contributor.

Capital

The United States is a capital-abundant country, both in terms of physical capital (plant and equipment) and financial capital. U.S. citizens hold a great amount of wealth invested in a variety of assets. In addition, foreign citizens are also quite willing (even aggressive) to hold their wealth in dollar-denominated assets. On the demand side, U.S. manufacturers in general, and food processors in particular, are constantly looking to mechanize their operations, so as to substitute away from high-cost labor and to reduce personnel problems. In spite of a large demand for investment capital by U.S. corporations, the large supply of willing investors helps keep rates of interest in the United States at low to moderate levels. Thus the overall cost of capital, including depreciation and interest, as a component of value added in the U.S. food processing industry, is quite small, amounting to only 7.5 percent of the total cost of food. As with land, low capital costs likely contribute to a strong competitive position for U.S. food manufacturers compared with those in other countries.

Market Assessment and Information Costs

It is typically more difficult to do business in a foreign country than in one's home country, especially in the early stages when a firm is considering either physical investment in or product expansion to another country. Expansion planning requires an in-depth knowledge of existing market channels and suppliers, of consumer preferences and current purchase behavior, and of domestic and foreign rules and regulations. Language and cultural barriers present considerable challenges, as well as institutional differences among countries.

In a survey of Texas agricultural exporting firms, Hollon (1989) found that, from a firm management perspective, the initial entry into export markets was significantly more difficult than either the handling of ongoing export activities or the consideration of expansion to new export product lines or markets. From a list of 38 items in three categories (knowledge gaps, marketing aspects, and financial aspects) over three time horizons (start-up, ongoing, and

expansion), the three problems rated most difficult were all start-up phase marketing items: (1) poor knowledge of emerging markets or lack of information on potentially profitable markets; (2) foreign market entry problems and overseas product promotion and distribution; and (3) complexity of the export transaction, including documentation and "red tape." Two of these items, market entry and transaction complexity, remained problematic in ongoing operations and in new product/market expansion. Import restrictions and export competition became more problematic in later phases, while financial problems were pervasive at all phases of the export operation.

Information and communication (even beyond the language barrier) may present obstacles to a firm, not only when it is considering entry into a new market, but also in its ongoing operations. Product markets operate in a dynamic economic environment. Economic conditions change, tastes and preferences change, political and cultural attitudes change: exporting firms needs to stay abreast of conditions that affect their particular products. This is especially true for exporters of processed foods. Markets for processed foods are particularly prone to change. New competition, new products, and even new packaging for old products are ongoing occurrences. Export firms find it necessary to have dependable company representation on hand in every import market in which they operate. Partly for this reason, many firms find it advantageous to set up foreign subsidiaries to market, and often to manufacture, their products. As noted in the introduction, U.S. foreign direct investment levels (both inbound and outbound) has grown substantially over the past decade. This topic is covered in greater detail in Chapter 3.

Market assessment (in the early stages) and information gathering (throughout) constitute major costs for a firm doing business in a foreign country, costs that are often lower for the same firm considering the same options in a domestic market. Because these costs result in higher prices that a firm must charge to remain viable in a foreign market, they leave export firms at an inherent disadvantage in overseas markets. That disadvantage must be

overcome by other means, such as lower production costs, more efficient distribution methods, or more innovative products.

Economic Conditions in Importing Nations

A major determinant of a country's export level is one over which domestic producers can exert very little influence: economic conditions in importing nations. Demand for a product is defined by both the willingness and the ability of consumers to buy the product. The "willingness" aspect of the definition has to do with consumer preferences. Ability to buy a product reflects a budget decision: given that a consumer wants to purchase a product, does s/he currently have the available resources to pay for it, or have access to future income so as to finance the purchase? Current income levels and/or expected future income growth levels enter into product purchase decisions. Asset liquidity is a third element that reflects a consumer's ability to buy a product.

Just as domestic demand for a product is in part determined by the aggregate ability of consumers to pay for the product, income, growth, and liquidity also affect the level of product demand by importing nations. Per capita income levels are fundamental to a nation's import activity. The world's wealthier nations constitute the bulk of worldwide trade in processed foods and beverages. United Nations data reveal that each of the top 10 importers of manufactured foods and beverages in 1990 was an OECD member country (Handy and Henderson 1994). Together these 10 accounted for 76 percent of worldwide trade in processed foods. The combined total share of the OECD countries and the newly industrialized countries of the Far East (Hong Kong, South Korea, Malaysia, Singapore and Taiwan) amounted to more than 90 percent of worldwide imports of processed foods in 1987 (Dayton and Henderson 1992).

Although lesser-developed countries do not yet make up a large percentage of global imports of processed foods, their combined imports are substantial and they constitute future growth markets for processed foods. A number of less-developed countries and newly industrialized countries are very important to U.S. food

processors. In 1994, Mexico and South Korea ranked third and forth (behind Japan and Canada) as destinations for U.S. exports of processed foods. Hong Kong and Taiwan were also top 10 importers. These four countries accounted for nearly 20 percent of 1994 U.S. processed food exports. Rapid growth in a middle-income country almost invariably turns that country into a significant importer of processed foods.

Another aspect of income growth is the role of income dynamics in importing nations. Although income growth varies year to year in every country, economic growth levels, both booms and recessions, can be transmitted across national borders. Unfortunately, this linking of economic activity tends to exacerbate the original situation. Thus it is not uncommon for global booms and busts to linger over a period of several years.

Because of the need to convert from one currency to another, international transactions add a new dimension to liquidity constraints. At times a country may experience a lack of foreign currency, or a lack of financial reserves with which to buy foreign exchange. This problem was front-page financial news during the late-1980's in the former Soviet Union, for example, and is fairly common in less-developed countries. Possible options available to a government facing a strong foreign exchange demand by its citizens include (1) using government reserves to buy foreign currencies on international markets, (2) changing the currency exchange rate (making foreign exchange more expensive), (3) placing quantity restrictions on imports, and (4) rationing foreign currency purchases. Each of these last three measures will lower an importing country's demand for imported products, even though income and growth may be strong in the country.

International trade in processed foods, however, appears to be less subject to changes in currency exchange rates than is trade in unprocessed farm commodities. This is attributable to imperfect competition in the processed foods market, which allows firms some degree of market power in setting prices. As demonstrated by Feenstra (1989) and others, firms typically use this market power to

set prices in foreign markets in a manner that moderates, or offsets, the impact of changes in exchange rates.

Market Structure

Firms with domestic market power may use that market power to help establish themselves in export markets. This is most obvious where firms separate the international market from the domestic market. Market segmentation can lead firms to increase revenues by restricting quantities sold at home and selling additional quantities overseas at lower prices. This can also result in charges of dumping, in the sense of selling at a price that is below the cost of production. Dumping is difficult to prove, however, in part because of the complexities in dividing fixed or joint costs between two markets.

A related issue is the sale of joint products, one in the domestic market and another in a foreign market. An example in a U.S. processed food industry arises from the trend toward the sale of chicken parts rather than whole birds. U.S. consumers have demonstrated a preference for chicken breasts, often skinless and boneless, that accounts for a large share of the value of the chicken. Some other chicken parts, necks and backs, for example, are byproducts in the U.S. market. If the byproducts draw higher prices abroad, but prices lower than prevailing in the foreign market—as happened with some U.S. chicken parts sold into Asian markets—the importing nation may attempt to prove that dumping or cross-subsidization has occurred.

Government Policy

The previous section considered economic factors that explain why trade occurs. This section explains how governments for their own reasons intervene in food and agricultural markets in ways that directly or indirectly affect trade in processed foods. Policies affecting international investment are discussed in the chapter 3. The implications of recent trade agreements appear in part II.

Comparative advantage in food and agricultural markets is impinged upon by government interventions to assist domestic producers, which may be done directly by commodity support programs or indirectly through restricting imports or boosting exports. This section is organized according to the type of policy or institution that affects trade.

Countries have three basic motivations for trade intervention: support domestic industry, generate revenue, and provide for consumer protection, each of which can take a number of forms and reflects social and political influences as well as economic forces. Support of domestic industry through export assistance or import protection may be a long-term strategy designed to overcome lower costs of production in another country. It could be a short-term measure to stabilize supplies. Trade policy could be used to offset unfavorable exchange rate developments. Trade interventions for consumer protection are discussed in chapter 7.

Import Policies

Tariffs

Where import policies exist, trade rules under the World Trade Organization (WTO), the successor organization to the General Agreement on Tariffs and Trade (GATT), prefer tariffs, which are essentially border taxes. Countries will occasionally impose tariffs on exports, but import tariffs are much more common. There are several types of tariffs, including ad valorem tariffs, specific tariffs, and variable import levies. An ad valorem tariff is a percentage tax on the value of the product. A specific duty is a tax on each unit, without regard to the value of the product. A variable import levy adjusts as international prices and domestic prices change. As practiced by the European Union for food and agricultural products, the variable levy adjusts to bring the price of imported products at the (usually lower) international price to the level of European prices. The variable levy is set a little larger than the difference in prices to provide a margin of preference, enough price advantage so European products will be preferred over imported products of similar quality.

Tariff escalation, a feature of the tariff structure for many products and many countries (Langhammer, 1987, Mabbs-Zeno and Krissoff, 1989) is a topic particularly important for processed products. Tariff escalation occurs when a country's import tariff schedule is structured to favor the importation of less-processed products by imposing a higher tariff on processed products than on the raw commodity (L. Neff, 1989). Houck (1986, pp.140-142) demonstrates the effects of introducing a tariff on final goods with free trade in raw products. A country might choose tariff escalation in order to boost use of its domestic manufacturing capacity. An example would be if a country had a relatively low tariff on soybeans, a somewhat higher tariff on soybean oil, and a much higher tariff on margarine. By doing so, the importer can increase processing throughput (and utilization of its associated factors of production) in its own market at the expense of its trading partners and overall economic efficiency. While tariff escalation is a strategy that distorts trade, it is not prohibited in WTO rules. By its potential to affect location of processing, tariff escalation is a factor in trade versus FDI decisions.

Nontariff Import Barriers

In addition to tariffs, there are quantitative restraints (Hillman, 1978) including quotas and voluntary restraint agreements (VRA). An import quota specifies the quantity that may be imported into a country during a specified time period. In the United States, import quotas have been imposed on a number of processed food products, including dairy products and sugar or sugar-containing products.

In the Uruguay Round agreements that transformed GATT into WTO and initiated a phased reduction of trade intervention, nontariff trade barriers were eliminated as instruments of protection. In the case of the United States (and some other countries), quotas were converted to tariff-rate quotas, a two-tier tariff that imposes a low tariff on a specified quantity and a higher tariff on quantities in excess of that specified quantity. In practice, the specified quantity may be very similar to the former quota and the second-tier tariff may be sufficiently high to deter further imports under most market conditions. The second-tier tariff is

meant to be reduced gradually, allowing countries time to adjust while import protection is reduced.

Voluntary restraint agreements, also known as voluntary export restraints (VER's), are typically negotiated quantitative targets that an exporting country agrees not to exceed. They are voluntary in the sense that the importer will not impose mandatory ceilings or prohibitive tariffs so long as the exporter does not exceed the voluntary limit. VRA's are most familiar in the form of automobile agreements limiting the number of Japanese vehicles imported into the United States. An example in food and agriculture is the voluntary restraint agreement on feed ingredients entering Europe from Thailand, Indonesia, and other suppliers (McCalla and Josling, 1985).

Import licensing, especially non-automatic licensing, is another way in which governments can control quantities imported. Whereas automatic licensing allows for monitoring trade, non-automatic licensing means that the government may use the issuance or nonissuance of an import license to restrict trade. In the case of NAFTA, the Mexican government had long used a system of import licensing in combination with other import barriers (Valdes, 1994). While the tariff for a product might have been relatively modest and trade prospects for export seemed promising, Mexican imports of the product may have been small if the government determined that the imports were unnecessary and denied the import license.

Import licenses were used legitimately in the presence of a quantitative restriction (before implementation of the Uruguay Round agreement) and are used legitimately in the related case of a tariff-rate quota. In the case of U.S. dairy product imports that fall under tariff-rate quotas, many products have quantity limits assigned to each country of origin, and importers must have licenses matching the product and country of origin. In this way, U.S. Customs tracks imports of dairy products and applies the higher, second-tier tariff to products in excess of licensed quantities.

Export Policies

Export subsidies are the provision of government funds—whether derived from general revenues, producer contributions, or some combination—that enables the exporting country to sell products in the international market at prices lower than in its domestic market. Export subsidies have been paid on some processed products as well as raw commodities by many countries including most European countries and the United States.

In the United States, export subsidies are paid under the Export Enhancement Program (EEP), the Dairy Export Incentive Program (DEIP), and the Cottonseed Oil and Sunflowerseed Oil Assistance Programs (COAP and SOAP). While dairy products and some grain mill products (oils and meals) are included, some agribusiness interests have complained that the programs are oriented too much toward unprocessed products. On average from 1989-1993, 81 percent of all export subsidies were paid on grains. The remaining 19 percent was divided among grain and oilseed products, dairy products, frozen meat and poultry, and canned peaches (Ackerman, Smith, and Suarez, 1995). Under the WTO trade rules established in the Uruguay Round, export subsidies are being scaled back in terms of quantities exported with the aid of subsidy and the total funds expended on each product or product group.

Export Promotion

Aside from export subsidization, countries also sponsor or become partners with firms to enhance exports through nonprice promotion activities such as foreign advertising and trade fairs in foreign countries. To this end, the United States instituted the Foreign Market Development Program (FMDP) in 1954 and the Market Promotion Program (MPP) in 1990. These programs promote the entire range of U.S. food and agricultural exports from raw commodities to branded food products. WTO rules do not impinge on non-price export promotion activities carried out under the MPP (Ackerman, Smith, and Suarez, 1995).

Export Credit

The United States and other countries, notably France, have established export credits, usually for less developed countries that have foreign exchange constraints. U.S. export credit programs are operated by the Commodity Credit Corporation (CCC), mostly for raw commodities but also for dairy products and products of grain and oilseed mills.

Export Restraint

A country may restrain food and agricultural trade in a variety of ways and for diverse purposes. One of these is to tax exports to raise revenue for the treasury. If the export taxes are higher on unprocessed goods, the result is to reduce exports overall and to encourage exports in a processed form. This strategy was followed by Argentina in its grains and grain products industries until eliminated at the end of 1991 (Roberts, 1994). While policies such as acreage set-aside may lead to smaller-than-otherwise exports, the United States does not employ policies for food and agricultural products that directly restrain exports.

More frequently used and more familiar to American food and agriculture industries is a trade embargo. For economic or political reasons, a country may impose an embargo (ban) on exports of a product or products to a single country or to all countries for a definite or indefinite time. In 1973, the United States imposed an embargo on oilseed product exports. International prices were unusually high, inflation was higher than desired, and devaluation of the U.S. dollar was making U.S. oilseed products less expensive to foreign buyers. To counteract potential inflationary effects on food prices and offset the exchange rate devaluation, the United States imposed the embargo.

While the oilseed embargo was undertaken for economic reasons, another embargo was imposed 7 years later for political purposes. The United States placed an embargo on grain sales to the former Soviet Union in 1980, when President Carter sought tangible steps to punish the Soviets for their invasion of Afghanistan.

In both U.S. embargoes, the immediate effect was achieved. In the former, exports were curtailed at a time of short supplies. In the latter, U.S. grain sales to the Soviets were halted. Both embargoes remain points of contention, however. The United States was considered by some countries to be a less reliable supplier than it had been formerly because the United States suspended contracts during the embargo. While political risks—in this case, commercial nonperformance due to governmental intervention —are a consideration in trade-versus-FDI decisions, the United States is generally considered among the countries with the lowest political risk associated with capital investment. Other complaints were that the earlier embargo exacerbated volatile international market conditions and that the later embargo was ineffective because it only diverted U.S. sales to other markets and Soviet purchases to other origins (U.S. Department of Agriculture 1986).

State Trading

State trading occurs when a government body performs trading functions. The most commonly observed state trading, at least until the collapse of the Soviet Bloc, was practiced by centrally planned economies. Some countries (e.g., North Korea, Cuba, and, for the most part, China) are still centrally planned, and others (for example, New Zealand, Canada, and Japan) have some form of governmental control of imports or exports through government trading agencies, licensing systems, statutory monopolies, and commodity marketing boards. State trading in its various forms may prevent or constrain trade and investment decisions in processed foods markets.

Summary

Trade in the U.S. processed foods sector has increased dramatically. Increased imports have brought a greater variety of food choices to U.S. consumers, while the expansion of exports, led by exports to East Asia, have grown still faster. U.S. exports of processed food have surpassed the exports of raw agricultural

products to make processed foods exports the larger part of food and agricultural trade.

The United States has long been a major trading nation in food and agricultural products, partly reflecting the abundant, fertile land base and the high productivity in food manufacturing. A large population base of high-income consumers makes the United States a magnet for food imports—or an attractive target for foreign food manufacturers. Standard trade theory helps to explain some of the growth in U.S. food trade. Intra-industry trade, on the other hand, does not accord with standard trade theory. It provides evidence that considerations other than relative factor costs and transportation costs are at work, and it directs attention to topics such as the strategies of firms and the role of information.

CHAPTER 3
Foreign Direct Investment in the Processed Food Sector

The Concept and Scope of Foreign Direct Investment

In addition to trade in goods themselves, such as processed foods, there is a large volume of international exchange of capital and technology used for food manufacturing and distribution. Modern measures of a country's or a firm's international competitiveness incorporate sales from foreign affiliates of home-country firms in addition to international trade (Horstmann and Markusen 1987, Kravis and Lipsey 1992, Porter 1990). Foreign affiliation can occur in various ways: license production to a foreign firm, franchise a foreign firm to market products under the home firm's trademark, acquire a minority interest in a foreign firm, develop a joint venture with a foreign partner, or obtain complete or majority ownership of foreign operations.

For purposes of this report, foreign direct investment (FDI) refers to investment in a foreign affiliate. The term "foreign affiliate" is used to identify a foreign entity in which a parent firm holds a substantial (but not necessarily majority) ownership interest. Parent firms are referred to as multinational firms or corporations (MNC's). U.S. firms' investing in production facilities in other countries is known as outbound FDI, while foreign firms' investing in facilities located in the United States is known as inbound FDI. Foreign direct investment is distinctly different from foreign portfolio investments and other international capital flows such as bank deposits. Portfolio investment takes a passive management role and does not seek control over decisionmaking within the firm. Foreign direct investment, by contrast, is defined as the ownership of assets in an affiliate by a foreign firm for the purpose of exercising control over the use of those assets. Since we are interested in the outcome of investing in foreign affiliates, we use sales of foreign affiliates as our primary measure of FDI. Using affiliate sales as an indicator of

FDI facilitates comparing the relative size of FDI and trade as strategies for accessing foreign markets. Using affiliate sales instead of "foreign direct investment position" (essentially the book value of assets) also avoids the problem of valuing assets of different vintages.

The source of FDI data at the industry level is the U.S. Department of Commerce, Bureau of Economic Analysis. The Department of Commerce defines foreign investment as direct when a foreign firm has a stake of 10 percent or more in a host country operation and no other firm has as large a share. The 10-percent ownership threshold reflects the notion that a foreign parent will normally have a strong say in the decisionmaking of a firm even if that parent does not own a majority stake. Other researchers have argued for a more restrictive 50-percent ownership cutoff to define foreign direct investment. But the difference in definition is minimized by the fact that the vast majority of FDI is majority owned. In 1992, 84 percent of U.S. food-processing affiliates in foreign countries were majority owned; and conversely, 98 percent of foreign-owned affiliates in the United States were majority owned by their foreign parents.

Furthermore, most FDI occurs by acquisition or merger rather than by building new facilities (known as greenfield investment). The country receiving FDI gains from the investing firm's knowledge in technology, marketing, management, finance, and information services. The gain in employment and economic activity is most obvious from greenfield investment. But even when FDI occurs by acquisitions, the parent firm typically upgrades the acquired firm's production processes and equipment, quality and environmental controls, procurement practices, packaging, and distribution systems. If production capacity increases sufficiently, net employment increases even with improved labor productivity.

FDI by acquisition does not necessarily increase employment, technology, or product variety in the receiving country. Parent firms frequently buy leading brands produced by a firm in the host country. Motivations for the parent firm are to increase international volume, increase growth rate, and achieve the competitive advantages of owning a leading brand in a new market.

In this situation the parent firm often gains new product and marketing technology from the acquired firm. Thus technology flows become two-way. By acquiring a leading firm or brand in the host country, the parent firm avoids a major disadvantage of greenfield FDI, by achieving immediate economies of scale. Examples are Grand Metropolitan (UK) buying Pillsbury in the United States and Philip Morris buying Jacob Suchard, one of Europe's largest confectionery firms.

Direct foreign investment can also be classified as vertical or horizontal. An example of vertical FDI is a parent firm investing in successive stages of production, either upstream (away from final consumption) or downstream (toward final consumption). An example of upstream FDI by a food manufacturer would be investing in can manufacturing or in agricultural commodity production. Downstream FDI would include a flour miller's investing in a wholesale baking operation or retail foodstores.

Tables 13 and 14 give an overview of the relative size of outbound and inbound FDI as reflected by affiliate sales for the entire food-processing sector and for the major industries within the sector.

Sales from outbound FDI remained slightly higher than sales from inbound FDI throughout the 1982-93 period. Sales from all U.S. food marketing affiliates abroad totaled $132.5 billion in 1993 (table 13), while sales from foreign-owned food marketing affiliates in the U.S. were $124.3 billion (table 14).

The composition of outbound versus inbound FDI varies widely by type of industry. Food-manufacturing affiliates account for 72 percent of sales of all U.S. food-marketing affiliates abroad. But food manufacturing accounts for a much smaller 37 percent of total foreign-owned affiliate sales in the U.S. food marketing sector. For the food-retailing industry, just the opposite is true. Sales from U.S. food-retailing affiliates abroad account for just 9 percent of total affiliate sales abroad, while U.S. food-retailing affiliates of foreign firms account for 42 percent of sales of foreign-owned food-marketing affiliates in the United States.

The next section examines factors that help explain or incentives for firms to engage in FDI. This is followed by a more detailed industry-by-industry review of the general trends in FDI discussed above.

Factors Influencing Foreign Direct Investment

FDI in Historical Context

Foreign direct investment is the dominant form of international commerce in processed foods. This is in sharp contrast to global commerce in agricultural commodities where trade dominates and FDI is nearly invisible. It also contrasts sharply with neoclassical international economic theory that does not reveal incentives for FDI in a perfectly functioning world of free trade.

This section addresses factors that explain FDI. While theoretical explanations for FDI tend to be eclectic, empirical observations of incentives for firms to operate facilities abroad tend to be generally consistent with the major strands of theory. Indeed, a number of empirical studies of the determinants or motivations for FDI have been reported. These reveal several consistencies that can be viewed as empirical regularities. These empirical regularities form the foundation for our contemporary understanding of what gives rise to FDI in processed foods, and shed considerable light on why

Table 13—-Sales by U.S.-owned food marketing affiliates abroad by industry, selected years, 1982-93

Industry	1982	1987	1992	1993	Share of total
	Million dollars				*Percent*
Food manufacturing	39,023	50,067	89,159	95,782	72.3
Food wholesaling	6,172	9,206	14,388	15,783	11.9
Retail foodstores	8,691	9,674	21,169	11,930	9.0
Eating & drinking places				9,007	6.8
Total, all food marketing	53,886	68,947	124,716	132,502	100.0

Source: Dept. of Commerce, BEA.

FDI is the preferred method of market globalization for these products.

The balance between portfolio and direct foreign investments changed markedly during the past century, with the United States playing a major role. An examination of the change suggests the underlying impetus of FDI and why FDI is particularly important for processed foods.

Until the First World War, nearly all international investment was portfolio; the United Kingdom supplied about half of the world's total, followed by France and Germany. Younger, rapidly expanding economies, primarily the United States, Canada, Australia, and Latin America, were the primary recipients. Yet, even before WWI, outbound American investment was getting underway.

From the outset, U.S. investment was different. As described by Södersten and Reed (1994, p. 468), "American investors seem to have been of a more dynamic type, not content to reap a fairly small interest-rate differential. Even before the First World War a dominant share of U.S. capital exports consisted of direct investments." In short, from the beginning, Americans investing abroad have shown a propensity to transfer know-how (or intellectual capital), more so than financial capital.

Between the world wars, international investment declined. But, the United States began to emerge as a major source, primarily of direct

Table 14—Sales by foreign-owned food marketing affiliates in the United States by industry, selected years,1982-93

Sector	1982	1987	1992	1993	Share of total
	Million dollars				*Percent*
Food manufacturing	14,847	22,862	46,799	45,765	36.8
Food wholesaling	7,039	13,953	18,984	21,734	17.5
Retail foodstores	} 18,758	24,312	48,159	51,537	41.5
Eating & drinking places		498	4,904	5,236	4.2
Total, all food marketing	40,644	61,625	118,846	124,272	100.0

Source: U.S. Department of Commerce, BEA.

investments as American industrialists began to establish foreign operations in the image of their pre-Depression home-market successes. Following WWII, the United States became the primary supplier of international finance, first in the form of official loans and gifts, and second in the form of FDI as American firms made major contributions to postwar industrial rebuilding. By 1960, the United States was supplying about two-thirds of all international investment. By the 1980's, observing U.S. industrial success throughout much of the free world, other countries—principally those of the European Union and Japan—became more aggressive in exporting their management technology through FDI, much of which landed in the United States. By the 1990's, with the fall of Soviet communism and the liberalization of third-world economies, FDI became the main instrument for global industrialization. As the 20th century ends, the nationality of multinational firms—the organizational result of FDI—has blurred in many cases to the point of being indistinguishable.

Profits that firms can earn in their international operations appear to be a motivation for FDI. This is evident in a sample of 144 food-processing firms worldwide used by Henderson, Vörös, and Hirschberg (1996) to compare profitability based on sales from foreign affiliates. In that sample, sales from foreign affiliates exceeded exports from home countries by a ratio of 5 to 1. For firms with foreign sales equal to or exceeding 35 percent of total sales, net income as a percentage of assets was higher than for firms with foreign sales below 35 percent of total sales. In short, FDI occurs because a firm has some advantage it can exploit in foreign markets. In the food and agricultural sector, such advantage is more often a feature of processed foods than of basic commodities. The following analysis offers insight into why.

Determinants of FDI

Evolving developments in the theories of international economics accommodate conditions of imperfect competition such as those observed in processed food markets (product differentiation, for example, and economies of scope, scale, and size). Theoretical constructs help identify the motivations for firms to engage FDI.

These developments have been joined by an expanding body of empirical studies that reveal product, firm, industry, and/or country idiosyncracies that are associated with observed configurations of FDI. The major constructs and empirical findings reveal general patterns that characterize the dominant forces behind FDI in processed foods.

Theoretical Considerations

A number of theoretical developments contribute to our understanding of the determinants of FDI. Early on, Vernon (1966), in his work on the product-cycle hypothesis, advanced an explanation for FDI based on product differentiation. The essence of this hypothesis is, if a firm expands to a foreign market in early stages of a product life cycle, it typically does so through exports. But, as growth in production and sales expands, a firm finds it must nurture increasingly-close working relationships with both suppliers and distributors. The greater the product uniqueness (differentiation), the more important these special relationships. Firms often find that they can best manage such special relationships in foreign markets with on-site facilities, thus they engage in foreign production (outbound FDI). Subsequently, the importance of product differentiation (and other unique, firm-specific attributes) has become a central theme in theories of FDI.

Buckley and Casson (1976) extended Vernon's construct by emphasizing imperfections in the foreign upstream or downstream markets. Where needed inputs or merchandising and distribution methods (marketing services) are highly specialized, markets for those supplies or marketing services may be difficult to organize. This is particularly so in the presence of uncertainty over demand, high investment costs, and the need for rapid exchange of information, close coordination, and joint planning. Faced with imperfect external markets, firms elect to internalize the supply of these critical inputs or distribution and merchandising services, thus entering into outbound FDI in vertically-adjacent sectors.

Caves (1982) posited that many of the attributes associated with a firm's unique product(s) are intangible (examples include, technical

production or merchandising knowledge, brand names, trademarks, team-specific management skills, special relationships with suppliers and customers). Because they are intangible, it is difficult for a firm in one country to sell them to a firm in another country. Thus, the firm has an incentive to develop overseas operations to capture the full earnings potential of these unique attributes in foreign markets.

Synthesizing several conceptual strands, Dunning (1977) advanced the *OLI paradigm* as an eclectic theory of FDI. OLI represents *ownership* advantages, *locational* considerations, and *internalization* gains. Ownership advantages are those firm-specific assets, such as the intangible assets discussed by Caves, that give a firm a competitive edge over both domestic and foreign rivals. Such intangible assets are also considered to be a firm's intellectual property or intellectual capital. Locational considerations encompass such things as transportation costs and import restrictions that give a firm a cost advantage for operating in a foreign market. Internalization gains concern factors that make it more profitable to carry out transactions within a firm than to rely on external markets (as in the Buckley and Casson construct, above). Dunning's theory holds that all three conditions are necessary; together they are sufficient motivation for a firm to invest in direct foreign production.

Ethier (1994) introduced refinements to the OLI paradigm that reveal an expectation for the major flows of FDI between countries with relatively similar economic conditions. In the presence of ownership advantages (firm-specific assets) that can be emulated over time, and a high ratio of international transportation to host-country labor costs (locational consideration favoring host-country production), a firm is motivated toward FDI in order to internalize earnings accruing to ownership advantages, thereby reducing the chance of copying by a host-country firm. However, if, for example, host-country wages and salaries are sharply lower than in the firm's home country, a copycat host-country firm can pose a credible threat to sustained earnings from direct entry by the external firm. Knowing this, the external firm will engage FDI in the host country only if it believes that the wage difference is not

great enough to offset copying costs (industrial intelligence) by a host-country firm. Therefore, FDI partner countries are expected to have different *but not greatly different* economic conditions (such as labor costs).

Empirical Studies

Empirical studies of the determinants of FDI have been hampered by two factors, a relative scarcity of detailed data on FDI, and complexities in measuring a number of the variables that are hypothesized to affect FDI in the various theoretical constructs (such as firm-specific advantage). Nonetheless, enough studies have been reported—some specific to processed foods—that stylized facts, or empirical regularities, can be raised.

In an early study of the shares of affiliates of U.S. firms in the outputs of Canadian and British industries, Caves (1974) found a statistically significant positive relationship between these shares and a set of factors taken to reflect firm-specific (ownership) advantages (such as experience with multi-plant management, expenditures on research and development (R&D), and advertising intensity). Wolf (1977), in a study of the share of production by U.S. firms accounted for by foreign operations, found this to be positively associated with a firm's technological expertise (as measured by the proportion of engineers and scientists in a firm's workforce) and size of firm.

A number of other studies have documented similar findings. Grubaugh (1987) reported results from an study of 300 U.S.-based multinational firms that tie FDI directly to relative levels of firm expenditures on both R&D and advertising. Handy and MacDonald (1989), using cross-sectional data on 32 U.S. manufacturing industries, also found positive impacts of R&D and home advertising on FDI, as did Yu (1990) in another study. Dunning (1981) cited evidence of a positive relationship between the value of a firm's intangible assets and FDI. Ray (1991), in a study of 32 manufacturing industries in five countries, found FDI positively related to specialized human capital, managerial intensity, and share of home market. In a study of 27 industries in 30 countries, Baldwin

(1979) found that product differentiation, managerial intensity, and home market share affect FDI.

Specific to processed foods, Connor (1983), using data on U.S. food-manufacturing industries, documented positive impacts of firm size, advertising, R&D, and home market share on FDI. Using pooled, cross-section, time series data for 628 food manufacturers in 16 countries, Henderson, Vörös, and Hirschberg (1996) found intangible assets, product differentiation, firm size, and home market share positively associated with FDI. Overend and Connor (1994) examined factors influencing FDI patterns for a cross-sectional sample of 33 U.S. food-manufacturing firms that also do business in the UK. Their findings show a positive relationship between a firm's investment in foreign marketing expertise and FDI. Ning and Reed (1995) examined factors explaining the location of U.S. FDI for a sample of six developed countries from 1983 to 1989. They found cultural linkage and trading bloc memberships are major incentives for FDI abroad, followed by a strong home currency, fast foreign market growth, and low foreign income tax rates.

Regarding national characteristics, Veugelers (1991), in a cross-sectional study of FDI patterns in OECD countries, found positive effects on FDI of common borders and similarities in culture, language, stage of economic development, labor costs, and trade policies between host and home countries. For processed foods, Handy and Henderson (1994) have shown that the same set of economically advanced countries (the U.S., Canada, Japan, and the countries of the European Union) account for nearly all of the world's FDI, both inbound and outbound.

Principal variables related to FDI are summarized in table 15. When viewed in the context of the food and agriculture sector as a whole, reasons for the relative importance of FDI to global commerce in processed foods become clear. Processed foods are highly differentiated products, the result of considerable effort by food manufacturers, distributors, and food service firms to develop a steady flow of new products and product innovations, and to intensely merchandise these products through advertising and other

means of promotion. Global commerce tends to occur primarily among countries that are remarkably similar in overall economic character, yet whose firms have sufficient differences in intellectual property to differentiate their operations and products from those of rival firms in both home and international markets. This stands in sharp contrast to global commerce in agricultural commodities, where the dominant pattern is international trade in undifferentiated goods between fairly dissimilar countries.

Foreign Direct Investment in Food Manufacturing

Investment Abroad by U.S. Food Manufacturers

Most large food manufacturers rely much more heavily on foreign direct investment than on exports from their home country to access foreign markets. In 1993, the latest year in which industry-level data are available from the Bureau of Economics Analysis, 64 U.S. multinational firms held at least 10 percent equity in 762 food manufacturing affiliates in foreign countries. Figure 4 shows the relative value of shipments from U.S.-owned food-manufacturing affiliates abroad compared with the value of total processed food exports from the United States. Foreign affiliate sales have long exceeded the value of U.S. exports, but since 1985, the gap has

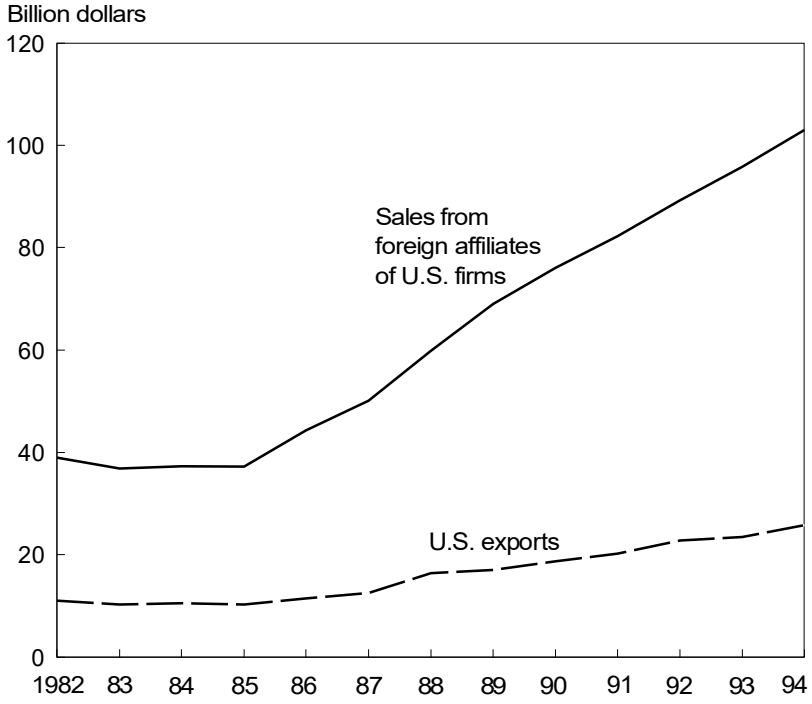
Table 15—Factors positively influencing sales by foreign affiliates

Factor	As measured by
Product and process innovation	Expenditures on research and development
Product differentiation	Advertising expenditures
Intellectual property	Value of intangible assets
Managerial skill and intensity	Value added as a share of value of shipments; employee educational level
Foreign Marketing expertise	Foreign sales as a share of total sales
Home market success	Market share
Economies of size, scale or scope	Size of firm
Locational advantage	Transportation costs as a share of value of sales; ratio of transportation to host-country labor costs
Trade barriers	Tariffs
Size of host market	Growth in real GNP per capita

widened. In 1982, sales from U.S. affiliates in foreign countries at $39 billion were 3.5 times larger than U.S. exports of $11 billion. Neither FDI nor exports grew in the early 1980's. Since then, both have recorded uninterrupted growth. From 1982 to 1993, sales from U.S. affiliates abroad grew 145 percent to $95.8 billion, while U.S. processed food exports increased 113 percent to $23.4 billion. By 1994, sales from foreign affiliates are estimated to have reached $103 billion—4 times larger than U.S. exports of $25.8 billion. Employment in U.S.-owned affiliates increased at a slower rate than sales. The number of employees at U.S. affiliates in foreign countries grew from 447,700 in 1982 to 550,500 in 1993, an increase of 23 percent. Most U.S. affiliates abroad are majority-owned by their U.S. parents. Of the total sales of U.S. affiliates abroad, 83 percent ($79.9 billion) came from majority-owned affiliates.

Figure 4

U.S. exports and foreign affiliate sales of processed food



Source: Economic Research Service, USDA.

Location of Affiliates

U.S. foreign direct investment is concentrated in developed countries (table 16). In 1993, European countries accounted for $54.4 billion (57 percent) of total U.S. affiliate sales abroad. Within Europe, the United Kingdom is by far the largest recipient of U.S. FDI followed by Germany, Netherlands, and France. Adding Canada and Japan to the European countries brings the share of U.S. affiliate sales to about 73 percent. U.S. affiliate sales grew much faster in Europe (187 percent) than in either Canada (107 percent) or Japan (105 percent) during 1982-93. Sales from U.S. affiliates declined in both South and Central America from 1982 to 1987, but have grown rapidly since. From 1987 to 1993, sales from U.S. affiliates in South America doubled and sales from U.S. affiliates in Mexico increased 282 percent.

Further evidence of growing U.S.-owned food-processing operations in developing countries is available from a data base of over 75 large U.S. food-processing firms maintained by USDA's

Table 16—Sales by U.S.-owned food processing affiliates abroad, 1982-93

Country/ region	1982	1987	1992	1993	1993 share	Change 1982 -93
	Million dollars				*Percent*	
Total, all	39,023	50,067	89,159	95,782	100	145.4
European countries	18,974	29,044	53,752	54,371	57	186.6
United Kingdom	5,696	7,124	12,214	11,579	12	103.3
Canada	5,258	5,522	NA[1]	10,891	11	107.1
Asia and Pacific	5,432	8,559	13,712	14,411	15	165.3
Japan	2,363	4,442	4,055	4,844	5	105.0
South America	5,133	3,911	6,794	8,033	8	56.5
Argentina	630	758	2,040	NA	NA	NA
Brazil	2,535	1,869	2,874	3,431	4	35.3
Central America	2,951	2,176	5,163	NA	NA	NA
Mexico	2,556	1,596	4,460	6,093	6	138.4

NA= Not available.

[1] Withheld by BEA to avoid disclosure.

Source:Dept. of Commerce, BEA.

Economic Research Service. In 1993, a subsample of 39 of these firms operated over 860 food-processing plants in foreign countries. Roughly one-third (about 295) of these plants were in developing countries, with over 200 plants in Latin America. U.S. firms are also increasing investments in Eastern and Central Europe, the former Soviet Union, and China. According to data compiled by ERS from media and company reports, at least 35 U.S. food manufacturers had invested in over 70 food-processing affiliates or joint ventures in these countries as of 1995. In China at least 29 U.S. companies had invested in food-processing operations.

Specialized engineering, packaging, and food ingredient firms facilitate foreign direct investment by making technology readily available and mobile across national boundaries. With the help of these specialty firms, food processors can pick and choose the best technology for specific functions from throughout the world and assemble it in a single factory whereever it is located—whether in Zimbabwe, Malaysia, India, or Venezuela.

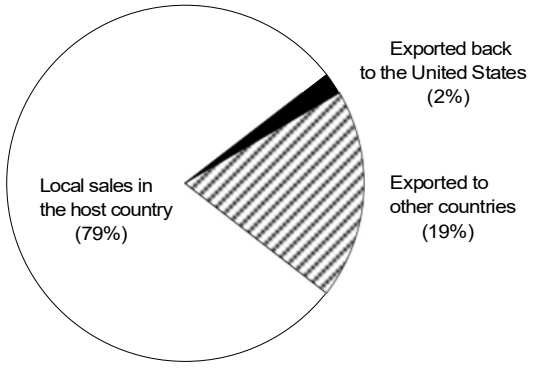
U.S. firms are continually reassessing and adjusting their foreign direct investment position by buying or building new plants overseas, consolidating existing plants, or divesting entire lines of business. From the ERS firm-level data base, observations are available on a constant sample of 32 U.S. multinational food processors for the years 1988-93. The total number of food-processing plants operated by these 32 MNC's increased from 1,955 in 1988 to 2,078 in 1993. All the increase came from foreign plants. The number of U.S. plants declined from 1,312 to 1,265 as these firms consolidated U.S. production into larger plants. At the same time, the number of majority-owned plants operated by these firms in other countries increased from 643 (33 percent of the total plants) to 813 (39 percent of the total). Nineteen of these 32 firms increased their number of foreign plants, 8 firms had no change, while 5 firms decreased the number of plants they operate abroad. During this time, 7 firms withdrew entirely from one or more foreign regions (such as the Middle East), while 8 firms entered new foreign regions for the first time. The number of firms that had at least 50 percent of their food-processing plants located in foreign countries increased from 8 to 14. CPC International, manufacturer

of Knorr, Hellmann's, and Mazola products, had 95 of its 123 plants (77 percent) located outside the United States in 1993. Philip Morris (Kraft General Foods) had the largest absolute number of foreign plants with 119 of its 251 plants located in foreign countries**.**

Destination of Affiliate Sales

In general, U.S. food-processing MNC's do not establish affiliates abroad for the primary purpose of exporting product to the U.S. market (fig. 5). Of total U.S. affiliate sales abroad in 1993, 79 percent remained in the host country (local sales) while 21 percent came from sales to other countries (BEA 1995A). But only 2 percent ($1,885 million) of affiliate sales were to the United States. By comparison, U.S. non-food manufacturing affiliates abroad exported an average of 14 percent of their total shipments back to the United States.

Figure 5
Sales by U.S. owned foreign affiliates by destination, 1993



Total sales by U.S. affiliates abroad $95.8 billion

Source: Economic Research Service, USDA.

Proximity of foreign affiliates to the United States plays a large role in explaining their export behavior. Even though Canada accounts for only 11 percent of U.S. affiliate sales worldwide, it accounts for 40 percent of affiliate exports to the United States. Likewise, Latin America accounts for 16 percent of U.S. affiliate sales, but a much higher 27 percent of affiliate exports to the United States. Conversely U.S. affiliates in Europe have 60 percent of all affiliate sales, but their share of affiliate exports to the United States is only 25 percent.

Intra-firm trade between U.S. parents and their affiliates is substantial. While U.S. affiliates abroad export only 2 percent of their sales to the United States, most of these exports (71 percent) are shipped to their U.S. parents, with the remaining 29 percent shipped to other firms in the United States. Exports from the United States to its food-processing affiliates abroad were also relatively small ($2,582 million) in 1993, but were still considerably larger than imports from those affiliates. Again, U.S. parents accounted for most (79 percent) U.S. exports to their affiliates.

Operations of Foreign Food-Manufacturing Firms in the United States

A rapid increase of foreign direct investment into U.S. food-processing industries was a phenomenon of the late 1980's. Foreign direct investment into the industry doubled between 1987 and 1992, and left 12 percent of the industry foreign-owned. The United States received large capital inflows in 1989, especially

Table 17—Sales by foreign-owned food processing affiliates in the United States, 1982-93

Country of origin	1982	1987	1992	1993	Share, 1993	Change, 1982-93
	Million dollars				*Percent*	
Total	14,847	22,862	46,799	45,765	100	208
Europe	10,527	17,967	32,994	31,159	68	196
Canada	2,218	3,174	5,113	5,208	11	135
Japan	564	612	5,131	5,737	13	917
Other	1,538	1,109	3,561	3,661	8	138

Source: Dept. of Commerce, BEA.

when the UK's Grand Metropolitan purchased Pillsbury. Japan's appearance in the U.S. food industry in the late 1980's was also a break from the past. While there were no megadeals in the U.S. food industry in the early 1990's, 1993 activities included UK's Cadbury-Schweppes' acquisition of A & W Beverages and Unilever's (Netherlands) acquisition of Kraft Foods Ice Cream Industries and Klondike. In 1994, Sandoz, a Swiss pharmaceutical company, acquired Gerber Foods.

These foreign acquisitions made their impression on the U.S. food industries through sales, employment, and foreign trade. Sales of U.S. affiliates of foreign firms were $46.8 billion in 1992, triple the level of 1982 ($14.8 billion). Sales declined slightly in 1993 to $45.8 billion (table 17). Nearly all sales from these foreign-owned plants remained in the United States, indicating that they were targeting the U.S. market; only $2.2 billion (4 percent) of those sales were exports (BEA 1995B). Moreover, only a third of the exports from these plants were shipped to the foreign parent company. U.S. affiliates of foreign companies imported more processed food products ($3.2 billion) than they exported. And nearly half of the imports to these affiliates came from the foreign parent group. Foreign companies generally found it less expensive to locate production of many high-value products closer to the U.S. market than to the foreign source of the raw product. Foreign direct investment in the United States was also one way to circumvent some U.S. trade barriers.

European companies dominate as a source of inbound investment and sales (table 17). Sales from U.S. affiliates of European and Canadian companies grew during the 1980's and early 1990's, but sales from U.S. affiliates of Japanese companies grew faster. Japan raised its presence to 13 percent of the sales from foreign firms in the U.S. food industries, compared with Europe's 68 percent. Canada's share declined over the decade to 11 percent in 1993.

There is some variation among countries in their choice of products. Japanese companies have purchased or built plants that mostly produce their ethnic foods such as noodles, surimi, soy sauce, sake (a rice-based alcoholic beverage). They have also ventured into

Mexican-style frozen dinners and wine. Food and feed additives are also important Japanese investments, along with cutting-edge biotechnology as it relates to food. Japanese investors were more apt to start up new businesses than their European and Canadian counterparts.

European companies are broader based. Wine, cheese, chocolate products, and bottling plants are some of the enterprises of their U.S. affiliates. Grain products, frozen and canned vegetables are also included. Some chemical companies have also become important producers of food and feed additives. Recent investments of European conglomerates have cut across product lines.

Canadian investments are mostly in the U.S. distilled spirits industry. In recent years they have expanded into wines, fruit juices, and frozen foods. More recently, some Canadian companies, acting as conglomerates, expanded their investments into many nonfood areas, principally chemicals and entertainment.

There is a variation in the market share of the U.S. affiliates in relation to their industries. Overall, the market share of foreign-owned companies in U.S. food-processing industries is about 12 percent (BEA, 1995B). Foreign-owned companies have roughly one third of the U.S. market share in cookies and crackers and edible fats and oils. In comparison, foreign-owned distilled liquor plants have one-half of the industry. Foreign-owned dairy products and canned specialties comprise 10-15 percent of those industries.

In addition to geographic and market concentration, a number of general observations can be drawn from the study of the Department of Commerce data on FDI in U.S. food processing. Most FDI is horizontal rather than vertical. Food processors invest primarily in other food-processing facilities rather than in upstream or downstream operations. Second, most FDI outlays are to acquire existing facilities rather than to invest in newly constructed operations.

Inbound foreign direct investment has brought jobs to the U.S. food industries. U.S. food-processing affiliates of foreign companies

employed 200,000 persons, who were paid nearly $5.5 billion, for an average salary of about $27,500 in 1993. This compares with the 1982 employment of 126,000 persons who earned $2.5 billion (nominal dollars), for an average salary of about $20,000. Employment in foreign-owned companies is nearly 12 percent of the total employment of the sector, compared with 7.7 percent in 1982.

These trends show the importance of sales of affiliates of other countries since 1980. Foreign direct investment will likely continue to grow, and companies will be morely likely to expand their markets through their foreign affiliates rather than through exports and imports. World trade in food products has increased since 1980, but sales of foreign affiliates has increased faster.

Foreign Direct Investment in Food Distribution

The food distribution industries include food wholesalers and brokers, and food retailers. Both inbound and outbound investment levels have grown steadily over the past decade.

Food Wholesaling

Sales from foreign affiliates of U.S. grocery wholesalers (outbound FDI) increased to $15.8 billion in 1993, a 9.7-percent increase over 1992 and a 156-percent increase from 1982 (table 13). Sales from U.S. grocery wholesale affiliates owned by foreign firms (inbound FDI) increased to $21.7 billion in 1993, growing 14.5 percent from 1982 (table 14).

Many food wholesaling firms have expanded via joint ventures in foreign markets. Sam's Warehouse Club is the leading wholesale club in the United States. Facing saturated markets in the United States and unfulfilled demands globally, Wal-Mart, Sam's parent firm, has been particularly aggressive in this regard with expansion plans for Asia and South America. As part of its first move outside of the Western Hemisphere, Wal-Mart set up a Hong Kong joint venture in 1994 as a foundation for further expansion into the Far East. The joint venture is part of a plan to open Value Clubs as a

stepping stone into China. Value Club is a joint venture with Ek Chor Distribution System Co. Ltd., a Hong Kong subsidiary of Bangkok-based C.P. Pokphand Co. Value Clubs are smaller versions of the Sam's Club membership warehouses. Plans called for construction of two units in China in 1995. In addition to expansion plans in Asia, plans called for an additional 10 to 12 warehouse clubs and 10 to 12 supercenters in Mexico. Wal-Mart also plans to open Sam's Clubs in Brazil, through a joint venture with Brazil's major retailer Lojas Americana, and Sam's Clubs is in the first phase of its expansion program in Argentina. Another leading wholesale club, Price Company, went international for the first time in 1993, opening units in the United Kingdom and Mexico. Price/Costco, formed by a merger between the Price Company and Costco Wholesale Club, opened 7 warehouses in Canada during the first half of fiscal 1994. In early 1995, Price/Costco Inc. agreed to acquire Price Enterprises' stake in the companies' Mexican joint venture. Mexico Clubs operates 12 Price Club membership warehouse stores in Mexico.

The king of foodservice distributors, Sysco Corp., has a company in British Columbia called Sysco/Konings Wholesale. Another leading foodservice distributor, Rykoff-Sexton, operates a Mexican distribution center.

Food wholesaling industry-leader Fleming formed a joint venture with Davids Holdings, the leading wholesaler in Australia. The joint venture, Davids Investments Asia Plc. Limited, was formed to establish full-line distribution centers in Asia. Fleming expects the joint venture also to help with its exporting and importing activities. Fleming has foreign affiliates in the Caribbean, Japan, Mexico, Korea, and the former Soviet Union.

Food Retailing

Inbound Investment

Sales by U.S. food-retailing affiliates of foreign firms reached $51.5 billion in 1993, according to the most currently available data (table 14). Food-retailing affiliate sales amounted to 13.4 percent of

total U.S. food store sales in 1993. The 5 largest U.S. food-retailing affiliates of foreign firms were among the 30 leading food retailers nationwide, generating sales of $39.5 billion in 1994 (table 18). Fourth-ranked nationally Albertson's (Boise, ID) was the largest U.S. affiliate, with sales of $11.9 billion in 1994. U.S. affiliates have grown both by building new stores and by acquiring other food retailers. There are successful examples of both strategies among the largest retailers. Both Albertson's and Food Lion (eighth-ranked nationally) have relied almost exclusively on internal growth strategies. Ahold, USA, the U.S. subsidiary of Royal Ahold (The Netherlands), and The Atlantic and Pacific Tea Company (A&P), owned by Tenglemann (Germany), have grown by acquiring small local and regional supermarket chains.

Most Americans could not identify these food retailers as foreign-owned firms, for a variety of reasons. Foreign investment and ownership can take a variety of forms, and most foreign firms imitate marketing and merchandising practices of their domestic counterparts. Store banners (names) are often maintained after foreign acquisition. Products and services offered are little different from those carried by domestic retail counterparts. Foreign parent firms have thus far shown little interest in exporting retail products to their U.S. operations. Although foreign investors and retailers have introduced new concepts in the United States, their success has varied.

Table 18— Sales of leading U.S. food retailing affiliates of foreign firms, 1994

U.S. affiliate	Foreign investor (country)	National ranking	1994 sales
			$Billion
Albertson's	Theo Albrecht (Germany)	4	11.9
Atlantic and Pacific Tea Company[1]	Tengelmann, AG (Germany)	7	10.3
Food Lion	Delhaize, Le Lion (Belgium)	8	7.9
Ahold, USA[2]	Ahold (The Netherlands)	9	7.4
Shaw's Supermarkets	Sainsbury PLC (U. K.)	29	2.0

[1] A&P, Waldbaums, Food Emporium, Super Fresh, Farmer Jack, Kohls.

[2] Edwards, Mayfair, Finast, Giant Food Stores (Carlisle, PA), Martins, Tops, BI-LO.

In the 1980's, French retailers built very large stores in excess of 100,000 sq. ft. of selling area called hypermarkets, a European retail concept. Early successes were not sustained, and in the 1990's, a number of foreign-owned hypermarket firms such as Carrefour and Leeds failed to generate breakeven sales volume, resulting in their exit from the industry.

Not all European retailers have failed in efforts to transplant new concepts to the United States, however. When Kings Supermarkets was acquired by a British firm (Marks and Spencer), they introduced high-quality, upscale private label food products (with emphasis on store-prepared product lines) more typical of their upscale European foodstores. Although the concept has been successful, few, if any, domestic retailers have directly applied the format elsewhere.

Outbound Investment

Foreign sales by U.S. food-retailing affiliates reached $11.9 billion in 1993 (table 13). U.S. affiliates abroad generated an income loss of $433.0 million in that year and employed 108,800 persons. Safeway Inc., owns and operates 235 supermarkets in Canada, accounting for sales of US $3.4 billion in 1994. In addition to majority ownership, food retailers have used joint ventures, franchising, and licensing as means to enter foreign markets. Circle K, a convenience store operator, has joint venture and franchising agreements in 19 countries, including Canada and the Pacific Rim countries. Although technically not considered a foreign investor, IGA, Inc. (Independent Grocers Alliance), a cooperative supermarket operator, has licensed IGA foodstores in a number of countries in recent years. IGA provides training, product procurement, branding, and merchandising support for overseas retailers. There were 385 foreign supermarkets located in 19 countries participating in the IGA program in 1994.

As the aggregate figures indicate, inbound and outbound foreign investment by food retailers is disproportionate. The greater involvement by overseas investors in U.S. food retailing is due to a number of factors: (a) the U.S. market is quite large relative to

many foreign markets, (b) the U.S. food distribution infrastructure is probably the most highly developed relative to any other country, (c) there are fewer restrictions to overseas investors than in many other countries, (d) regulations related to the building of new stores and support facilities are less stringent in the United States than in many European countries, (e) overall growth prospects are more favorable than in other industrialized economies, and (f) the political and business environment is stable, contributing to lower investment risk. The competitive environment of U.S. markets may not be fully appreciated by overseas investors, however, as evidenced by the failure of many hypermarket format stores opened during the 1980's.

Recent overseas investment by U.S. retailers has tended toward developing economies, especially those in the Pacific Rim region. U.S. investment abroad is much smaller than that of many foreign investors in U.S. food retailing. Although reasons for this pattern are not yet fully understood, it is likely that investment risk in developing countries is viewed as a barrier by U.S. retailers despite opportunities for growth. The persistence of these conditions facing U.S. food retailers overseas will likely result in inbound investment continuing to exceed U.S. investment abroad.

Foreign Direct Investment in the Food Service Industry

U.S. food service companies are moving into international markets as they look to foreign countries for expansion. U.S. chains have already penetrated foreign markets. Japan, Canada, Australia, and Mexico are popular locations for many fast food chains. More companies are scheduled to open additional units there and in other countries around the world in the next several years.

Foreign firms are also gaining ground in U.S. markets by purchasing U.S. firms and establishing affiliates here. Burger King and Hardee's, once U.S. owned, are now foreign-owned chains.

Table 19—Top U.S. food service firms in foreign markets by number and sales

Chain[1]	Total systemwide units, 1994	Foreign units, 1994		Total systemwide sales, 1994	Foreign sales, 1994	
	- - - Number - - -		*Percent*	*- - - $Million - - -*		*Percent*
McDonald's	15,205	5,461	36	25,986	11,046	43
KFC	9,407	4,258	45	7,100	3,600	51
Pizza Hut	11,546	2,928	25	6,900	1,900	28
Subway	9,893	944	10	2,500	265*	11
Domino's Pizza	5,079	840	17	2,500	415	17
Dairy Queen	5,542	628	11	5,542	300*	09
Wendy's	4,411	413	9	4,277	390*	09
Church's	1,171	233	20	590	125	21
Arby's	2,789	168	6	1,770	74	04
Taco Bell	5,615	162	3	4,290	130	03
Little Caesar	4,855	155	3	2,000	70*	04
TCBY Yogurt	2,801	141	5	388	22*	06
Sizzler	600	119	20	858	230	27
A&W	671	104	15	236	68	29
Big Boy	940	90	10	1,130	100*	09
Denny's	1,548	58	4	1,779	63	04
Popeye's	772	48	6	584	35	06
Sbarro	729	41	6	384	22	06
Ponderosa	680	40	6	690	40*	06
International House of Pancakes	657	37	6	632	32*	05
TGI Fridays	314	37	12	897	114	13
Bonanza	264	30	11	267	32	12
Round Table Pizza	576	29	5	351	15*	04
Carl's Jr.	649	20	3	587	30*	05
Long John Silver's	1,456	16	1	938	6	01
Jack In The Box	1,224	16	1	1,050	23*	02
Whataburger	517	9	2	383	5*	01
Perkins	432	8	2	626	12	02
Showbiz Chuck E. Cheese	332	8	2	370	7	02
Total	90,675	17,038	19	72,333	19,171	27

[1] Includes U.S. company-owned and franchisee-owned establishments.

*Technomic Estimate.

Source:Restaurant Business, June 1994.

U.S. Investment Abroad

In 1993, the latest year for which industry-wide data are available, there were 10 U.S. food service firms with 78 foreign affiliates (BEA 1995A). These affiliates had sales of $9.0 billion, 7 percent above 1992 sales (table 13).

The figures given above came from industry-wide BEA data. However, trade data were used to compile information at the firm and chain level. As U.S. markets become saturated and U.S. companies look for alternative markets, more fast food outlets are showing up in other countries. Twenty-nine of the top 50 restaurant chains operated a total of 17,038 units in other countries in 1994 (table 19). Seven of those chains accounted for 15,472 or 91 percent of those units operating outside the United States (table 20). At the beginning of the 1970's, only 900 total units operated outside the United States.

Asian/Pacific countries accounted for the largest share of these units, 37 percent. Twenty-nine percent operated in European, African, or Middle Eastern countries. Canada accounted for 24 percent of the units and Latin American countries, 10 percent. Hamburger, chicken, and pizza chains dominate the international market.

Table 20—Major U.S. food service chains operating outside of the United States, 1994

Chain	Asia/Pacific	Europe, Africa, Middle East	Latin America	Canada	Total
		Number of establishments			
McDonald's	2111	2197	436	717	5461
KFC	2172	817	396	873	4258
Pizza Hut	910	1148	415	455	2928
Subway	115	31	62	736	944
Domino's	232	160	203	185	780
Dairy Queen	125	36	16	451	628
Wendy's	143	41	51	178	413
Total	5808	4430	1579	3595	15412

Source: Company annual reports.

McDonald's, KFC, Pizza Hut, Subway, Domino's, Dairy Queen, and Wendy's are the top 7 U.S. restaurant chains accounting for the largest number of foreign units (table 20). McDonald's, the largest single food service organization in the world, had 15,205 units worldwide in 1994 and sales amounting to nearly $26 billion. McDonald's operates in 79 countries and accounts for the largest number of units operating outside the United States, 5,461. Thirty-six percent of McDonald's total units operated outside the United States compared with 34 percent in 1993. Most McDonald's units are franchised. McDonald's also leads in foreign sales, accounting for $11 billion in 1994. Major markets for McDonald's units include Japan, Canada, Germany, England, Australia, and France. Foreign sales account for about 43 percent of McDonald's systemwide sales.

In 1994, McDonald's opened its first restaurants in Bulgaria, Bahrain, Kuwait, Latvia, Oman, United Arab Emirates, New Caledonia, Romania, Egypt, Trinidad, and Saudi Arabia. McDonald's expects to open 900 to 1,200 restaurants around the world in the next several years with two-thirds of those being outside the United States. England, France, and Germany will be popular locations.

The McDonald's chain not only operates traditional restaurant units but satellite stores as well—smaller units such as kiosks or mobile carts— which serve simpler menus. McDonald's expected to open about 1,000 satellites around the world in 1995. They believe the key to aggressive satellite programs is alliances with retailers and oil companies that operate convenience stores. In 1994, McDonald's satellite units operated in 377 Wal Marts throughout the United States, Canada, Mexico, and Puerto Rico. The United States, Finland, Denmark, and Italy now have McDonald's in service stations.

KFC, a division of PepsiCo, Inc., has the second largest number of units outside the United States, 4,258, which operate in 73 countries. Sales outside of the United States, $3.6 billion, accounted for 51 percent of their systemwide sales in 1994.

Forty-five percent of all KFC units are located overseas. One fourth of KFC's foreign units are in Japan, 11 percent in Australia, and 8 percent in the UK. Of the six largest restaurant chains, only KFC and Pizza Hut operate units in Africa.

Pizza Hut, also a division of PepsiCo, Inc., has 11,546 units operating in 82 countries. Twenty-five percent or 2,928 restaurant units are located outside the United States. Pizza Hut chains are located primarily in Australia, France, Spain, the United Kingdom, and Trinidad.

Subway, a subsidiary of Doctor's Associates, Inc., operated 9,893 units in 21 countries in 1994. About 944 of those restaurants were located outside the United States. In 1994, Subway opened new units in 11 countries including Mexico, China, Japan, Indonesia, Philippines, Iceland, Slovenia, Cyprus, Kuwait, Saudi Arabia, and Korea.

Domino's, the second largest pizza restaurant chain, operates 840 franchised units in 37 countries. Japan and Canada are popular locations. Domino's future growth will depend more on international expansion. They already have about 90 stores in the UK and expect to grow in South America.

Dairy Queen, a subsidiary of International Dairy Queen, Inc., had 628 of its 5,554 units operating outside the United States in 1994. Dairy Queen has opened new stores in Mexico, China, Slovenia, Cyprus, Kuwait, Saudi Arabia, and Korea since 1993. Dairy Queen operates in 16 countries.

In 1994, Wendy's operated 4,411 units in 32 countries and territories. Four-hundred thirteen of their units operate outside the United States. Canada is the largest market for Wendy's restaurants. Nearly half of the units outside the United States are located there. Other popular markets for Wendy's restaurants are Japan, with 42 units, Philippines with 30, and Korea, with 29. Wendy's plans called for 100 new international units in 1995 to be concentrated in Latin America, the Pacific, Western Europe, and Canada. Wendy's

anticipates a total addition of 550 new units abroad over the next 3 years.

Though fast food outlets paved the way into the international market, family chains such as Denny's, Big Boy, and International House of Pancakes are following (table 19). Casual dinner house restaurants such as TGI Fridays and grill buffets like Sizzler, Golden Corral, and Ponderosa are also moving into the international arena.

Table 21—Major foreign firms with U.S. food service operations, 1994[1]

Foreign investor/ location	U.S. chain	Type	U.S. sales[2]	U.S. units[2]
			Bil. dol.	*Number*
Grand Metropolitan, PLC London, England	Burger King	Sandwich	7.250	6,090
Imasco Ltd.	Hardee's	Sandwich	3.511	3,404
Montreal, Canada	Roy Rogers	Sandwich	0.460	530
Allied-Domecq, PLC	Dunkin' Donuts	Snack	1.332	2,979
London, England	Baskin-Robbins	Snack	0.560	2,355
Compass Group , PLC London, England	Canteen Corporation	Contract	1.077	1,600
Onex Corporation Toronto, Canada	LSG Lufthansa Services/Sky Chefs	Catering	0.460	34
Sodexho	Sodexho USA	Catering	0.435	490
Paris, France	Gardner Merchant Food Services	Catering	0.355	1,100
The Albert Abela Group Paris, France	The Wood Company	Contract	0.305	296
Total			15.745	18,878

[1] Includes company-owned and franchisee-owned operations.

[2] Projected.

Source: Nation's Restaurant News, Aug. 1994.

Foreign Investment in the U.S. Food Service Industry

Foreign-owned food service firms had 77 U.S. affiliates in 1993 according to industrywide data (BEA, 1995B). These U.S. affiliates accounted for sales of $5.2 billion (table 14), and had 116,800 employees. Trade data were used to report information at the firm and chain level. Trade sources report that food service sales in the United States by major foreign investors amounted to $15.7 billion in 1994 (including franchise sales), up 11 percent from 1993 sales of $14.1 billion (table 21). The number of U.S. units operated by these investors increased from 15,656 in 1993 to 18,873 in 1994.

Major foreign investors in the United States are Grand Metropolitan, PLC, London, England; Imasco, Ltd., Montreal, Canada; and Allied-Domecq, PLC, London, England. Grand Metropolitan, PLC, owner of the Burger King chain, is the largest foreign investor in U.S. food service operations. Grand Metropolitan acquired Burger King in 1988 with the purchase of Pillsbury. Among the top 50 franchised chains operating in the United States, Burger King was number two in 1994 with total worldwide sales of $7.5 billion. Foreign sales accounted for only 19 percent of that total. Burger King operated over 7,500 units worldwide with over 6,000 units operating in the United States in 1994.

Imasco, Ltd., Canadian-based owner of the Hardee's and Roy Rogers chains, is the number two foreign investor. In 1989 the Marriott Corporation sold most of its Roy Rogers restaurants to Imasco. Imasco operates about 4,000 Hardee's/Roy Rogers outlets in the United States with 1994 sales amounting to nearly $4 billion.

Dunkin Donuts was acquired in 1990 by London-based Allied-Domecq, PLC, the third largest foreign investor in U.S. food service operations. Allied Domecq also owns Baskin-Robbins ice cream stores. The firm operates 2,979 Dunkin Donuts outlets and 2,355 Baskin-Robbins outlets in the United States with combined sales of $1.8 billion.

London-based Compass Group, PLC, made its initial debut into the United States in April 1994 by buying the majority of Flagstar Cos.

Inc.'s Canteen Corp. U.S. sales for Canteen total $1.1 billion. Canteen operates 1,600 accounts in the United States.

Onex Corporation, the Canadian-based owner of Sky Chefs, recently signed a deal with Lufthansa AG of Frankfurt, Germany, that changed its signage to "LSG Lufthansa Service/Sky Chefs. This agreement created a global catering company with combined annual revenues of $1.3 billion.

Sodexho is a French contract catering company that has units in 60 countries and revenues in excess of $1.9 billion. In 1995, Sodexho acquired Gardner Merchant Services Group, creating the world's leader in contract catering with 11,745 units worldwide. The merger represents combined annual revenues of $3.65 billion. In the United States, Waltham, MA-based Sodexho U.S.A. operates 490 units and reported $440 million in sales. Combined, Sodexho and Gardner Merchant operated about 1,588 accounts in the United States with total revenues of approximately $800 million in 1995.

Sodexho's Gardner Merchant Services Group, which has been operating in the United States for 15 years, recently bought two of the catering segment's biggest accounts. In 1994 the Trumbull, Conn.-based division of London's Gardner Merchant Services Group, purchased from Morrison Restaurant Inc. the business and education accounts of its Morrison Hospitality Group. This acquisition increased Gardner Merchant's U.S. portfolio to more than 1,000 accounts and will nearly double its projected annual revenues in the future.

Other major foreign investors in U.S. food service include Kyotauru Co., Ltd., Tokyo, Japan (Acapulco, Charlie Brown's, Paragon Steakhouse); Nestlé (Stouffer Hotels, Top Restaurants, Rusty Scupper); and Unigate PLC, London, England (Black-eyed Pea, Dixie House, Taco Bueno, Casa Bonita, Crystal's Pizza).

CHAPTER 4
International Strategies in the Global Market

Chapters 2 and 3 reveal that both exports and foreign direct investment play an important role in the globalization of food markets. Although exports appear relatively less important than foreign affiliate sales in the aggregate, an examination of firm level data shows that the importance of exports and foreign affiliate sales varies among firms. Table 22 shows estimates of exports and foreign affiliate sales for 73 U.S. firms involved in food processing. Every firm exports, but 39 also supply processed food through their foreign affiliates. Among these firms, the ratio of foreign affiliate sales to exports varies from less than 1 to 61. The variation in the relative importance of exports and foreign affiliates among firms suggests that the optimal strategy for supplying foreign markets for each firm varies as well.

The variation in firm strategies for supplying foreign markets may have implications for U.S. policy. Current U.S. policy seeks to encourage the export of high-value products. Firms, however, have a variety of methods for placing their product in foreign markets. In addition to exports and foreign affiliates, firms can use joint ventures, licenses, or other forms of strategic alliances to supply foreign markets. As a result, the efficacy of U.S. export policy depends, in part, on the factors that lead firms to choose exports rather than an alternative production arrangement and on the relationship among various arrangements. Without an understanding of firms' strategies for supplying foreign markets and the effect of particular strategies on the export of U.S. processed foods, policymakers may be unable to set realizable goals or allocate resources effectively.

The analysis in this chapter focuses on the manufacturers of processed foods. For the most part, the retail and wholesale sectors of food processing do not produce goods for export. These sectors add value to a processed food product in terms of the service they

Table 22—Foreign sales of selected U.S. food manufacturers, 1992-93

Company	Exports	Foreign affiliate sales	Foreign affiliate sales/exports
	- - - Million dollars - - -		*Ratio*
Ag Processing Inc.	97.989	170.606	1.74
Agway	0.985	0.000	0.00
Agripac Foods Inc.	11.775	0.000	0.00
American Brands	44.000	417.600	9.49
American Home Products	56.800	0.000	0.00
American Maize Products	15.200	0.000	0.00
Anheuser Busch Cos. Inc.	608.400	968.900	1.59
Archer Daniels Midland Co.	937.482	2,232.100	2.38
Blue Diamond Growers	63.243	0.000	0.00
Borden Inc.	64.450	930.400	14.44
Bristol Myers Squibb	98.000	153.000	1.56
Brown-Forman Corp.	65.487	47.397	0.72
Campbell Soup	94.000	1,930.470	20.54
Canandaigua Wine Inc.	0.500	0.000	0.00
Chock Full O'Nuts	0.252	0.000	0.00
Chiquita Brands International Inc.	57.590	1,380.954	23.98
Citrus World Inc.	25.430	0.000	0.00
Clorox	3.097	80.732	26.07
Coca-Cola Co.	207.000	9,351.000	45.17
Colgate-Palmolive	64.000	0.000	0.00
ConAgra Inc.	1,328.883	1,310.922	0.99
Coors	114.523	0.000	0.00
CPC International Inc.	70.922	4,325.700	60.99
Curtice-Burns Inc.	15.160	46.582	3.07
Dean Foods Co.	144.680	5.000	0.03
Dole Foods Co.	66.167	1,657.000	25.04
Dial Corp.	6.000	0.000	0.00
Doskocil Cos. Inc.	6.482	0.000	0.00
Farmland Industries	32.700	0.000	0.00
General Mills Inc.	175.000	415.200	2.37
Gerber Products Co.	43.980	126.000	2.86
Gold Kist Inc.	27.511	0.000	0.00
Grace (W.R.) & Co.	8.800	297.800	33.84
Heinz (H.J.) Co.	105.297	3,053.473	29.00
Hershey Foods Corp.	197.450	407.920	2.07
Hormel (Geo. A.) & Co.	106.169	0.000	0.00
I.B.P. Inc.	1,388.896	0.000	0.00

Continued—

Table 22— Foreign sales of selected U.S. food manufacturers 1992-93—continued

Company	Exports	Foreign affiliate sales	Foreign affiliate sales/exports
	- - - Million dollars - - -		*Ratio*
International Flavors & Fragrance Inc.	6.363	293.640	46.15
Kellogg Co.	97.300	2,511.500	25.81
Knouse Foods Inc.	9.075	0.000	0.00
Land O'Lakes Inc.	106.000	0.000	0.00
McCormick & Co. Inc.	76.188	217.889	2.86
MM/MARS	120.000	4,000.000	33.33
Multifoods	28.354	556.100	19.61
Monsanto	70.500	0.000	0.00
Norpac Foods Inc.	17.146	0.000	0.00
Ocean Spray Cranberries Inc.	98.020	0.000	0.00
Orange-Co. Inc.	4.222	0.000	0.00
PepsiCo Inc.	247.800	5,381.600	21.72
Pet Inc.	26.424	261.900	9.91
Philip Morris Cos. Inc.	1,340.000	11,945.000	8.91
Proctor & Gamble Co.	101.000	329.000	3.26
Quaker Oats Co.	120.400	2,024.900	16.82
Ralston Purina	149.200	1,576.700	10.57
Riceland Foods Inc.	232.050	0.000	0.00
RJR Nabisco	243.000	1,540.000	6.34
Sara Lee Corp.	184.000	2,344.000	12.74
Seaboard Corp.	21.900	72.220	3.30
Smithfield Cos.	1.020	0.000	0.00
Smithfield Foods Inc.	41.130	0.000	0.00
Smucker (J.M.) Co.	20.471	57.623	2.81
Sun-Diamond Growers of California	142.700	0.000	0.00
Sunkist Growers Inc.	28.394	0.000	0.00
Thorn Apple Valley Inc.	13.300	0.000	0.00
Tree Top Inc.	28.128	0.000	0.00
Tri/Vallley Growers	25.781	0.000	0.00
Tyson Foods Inc.	352.00	0.000	0.00
Universal Foods Corp.	45.000	139.231	3.09
Valhi Inc.	12.107	0.000	0.00
Warner-Lambert Inc.	16.300	801.000	49.14
Welch Foods Inc.	49.500	0.000	0.00
WLR Foods	37.002	0.000	0.00
Wrigley (Wm. Jr.) Co.	34.452	634.678	18.42

Source: Economic Research Service

provide. As a result, the tradeoff between exporting and other supply arrangements for foreign markets, especially noticeable in the manufacturing sector, is not present in these sectors.

Strategies of Multinational Food Firms

Firm strategies in the global market for processed foods, their motivation, and their implications are described in this section. Expansion beyond the domestic market allows firms to pursue growth opportunities unavailable in the domestic market, to spread risk through geographic diversification, and to exploit brand and technology-related intangible assets. For example, the relatively slow population growth, the maturity of processed food markets, and the existence of high domestic market shares in some food-processing industries contribute to lower growth potential in U.S. food markets relative to some foreign markets. In addition, moving beyond the domestic market, U.S. food manufacturers may reap further benefits from the large investments they make in establishing brand names.

As firms move to a global marketing strategy, they choose from among a number of production and distribution arrangements: (1) Produce in their domestic market and export their product abroad, possibly using a foreign licensee or joint venture arrangement to distribute the product in the foreign market; (2) License production of the good for the foreign market to another firm; (3) Use a joint venture arrangement to produce the good in a foreign market with a partner; (4) Acquire a foreign affiliate, either through acquisition of an existing firm in the foreign market or greenfield investment, to produce and sell the product in a foreign market; and (5) Produce in a market other than the domestic market through a licensing agreement, joint venture, or a wholly owned foreign affiliate and export to another foreign market. For food manufacturers, the choice of arrangement depends on the feasibility of production outside the domestic market and the tradeoff between the risk in the foreign market and the firms' desire to maintain control over the product and its placement in the market.

To better understand the motives underlying firm strategies for accessing foreign markets, the Economic Research Service (ERS) of USDA and Agriculture and Agri-Food Canada (AAFC), in a joint study, conducted personal interviews with senior management officials of 17 multinational food-manufacturing firms with operations in the United States and Canada (Vaughan, et al., 1994). The median level of sales for these firms was $5.9 billion in 1992. All firms except one used a variety of methods to serve markets outside their home country. For 15 firms, foreign affiliates accounted for the highest proportion of sales outside the home country. All 17 firms used exports to access markets outside their home country, although export shares of firm sales were typically small. Several of the firms used exports to supply foreign markets only if the foreign market was unable to support local production. One firm was a clear exception, with exports accounting for about 50 percent of total sales. Licenses accounted for a small share of firms' sales—only one firm had a strong commitment to their use worldwide. The following discussion draws heavily from this joint study.

The fundamental basis for firms' choosing production abroad to supply foreign markets seems to lie in their desire to capitalize on existing intangible investments in their brand, knowledge, and reputation, while serving foreign markets in a cost-effective manner. For this reason, firms generally prefer foreign affiliate arrangements where they possess majority ownership in local production facilities and exert some control over management.

A foreign affiliate enables the parent firm to capitalize on intangible investments because it allows for greater control over the quality, distribution, and presentation of the product in the foreign market. It also enhances the ability of the firm to produce a good suited to the foreign customers' needs and preferences. These ownership benefits make exports less attractive and provide a strong motivation for foreign production by food-manufacturing firms.

Despite the strong motivations for foreign affiliate ownership, processed food manufacturers do choose other methods of supplying foreign markets, with their choice predicated on a number of factors.

These factors can be categorized under two headings: Feasibility of foreign production and risk-control tradeoff.

Feasibility of Foreign Production

The feasibility of production outside the home market affects firms' choices of production location and, thereby, may dictate the choice of strategy. If production outside the home market is infeasible (e.g., California wine cannot be produced in a foreign country), export from the home market becomes the only viable alternative for firms to supply foreign markets. Firms consider several explicit costs when determining the feasibility of production in a market. Among the most important cost considerations for food manufacturers are the ability to achieve economies of scale, the cost and availability of inputs, and delivery costs. In addition to these explicit costs incurred from production, demand considerations and the implicit costs incurred from barriers to entry and the infrastructure of the market may also play a role in determining the feasibility of production in a market.

With economies of scale, a primary concern for the parent firm involves the ability of foreign production to achieve cost efficiencies from large-scale production comparable to those of the parent's home units. If no present or future potential exists for achieving economies of scale in a foreign market, export or licensing offers a more attractive alternative for a firm entering the market. Though economies of scale focus on cost efficiencies, large-scale production requires consideration of demand constraints (e.g., the level of per capita income, the size of the population), other supply conditions, (e.g., the level of competition in a market), and the infrastructure for transporting and storing foods. For example, a foreign market with high per capita income, an infrastructure that supports frozen food storage, and few other suppliers possesses good potential for achieving economies of scale for manufacturers of prepared and frozen foods. The absence of any of these characteristics in the foreign market reduces the likelihood that demand will be sufficient to capture economies of scale with production in the market and increases the likelihood that firms will

choose to use exports from another market, or perhaps licenses, to supply the market.

The location of food-processing industries that require a large component of raw agricultural materials, rather than semi-processed ingredients, will be strongly influenced by the availability of the primary ingredient. In these cases, a country's comparative advantage in the production of the required raw agricultural input may dictate a firm's choice of production location, (e.g., firms that can pineapples tend to locate their processing facilities near pineapple plantations). If a country does not have a comparative advantage in growing pineapples, it is unlikely that a firm will locate a canning facility within its borders. For firms using processed agricultural ingredients or, alternatively, firms using agricultural ingredients that are easily purchased in the world market, ingredient requirements have less impact on their choices.

Though not related to production costs, costs incurred in the delivery of a firm's product from the point of production to the consumer affects the relative feasibility of production. Even if a firm can achieve identical cost efficiencies in both the home and foreign market, high delivery costs may make export from the home market relatively less profitable. If these costs reflect high transport costs, savings occur when firms locate production close to the market served. Alternatively, if these costs reflect high tariffs, savings occur when firms locate within the foreign market. In either case, high delivery costs to a foreign market increase the likelihood that production, through either a license, joint venture, or wholly owned subsidiary, will occur in a foreign market.

In addition to the explicit costs considered by firms in choosing among global market strategies, firms may also face implicit costs in overcoming barriers to entry in new markets. For example, difficulties in accessing and establishing a foreign distribution system may increase the cost of entering a market with exports. Effectively reducing these costs may entail a distribution arrangement with a licensee or a joint venture partner that possesses a distribution system within the market.

The feasibility of production in a foreign market changes with market conditions. Food manufacturers actively pursue growing markets. When firms first enter these markets, demand for their product may be insufficient to warrant production in the foreign market. In this case, the firm may use exports to develop the foreign market. As the firm increases the demand for its product, the ability of a foreign plant to capture cost advantages from economies of scale increases, and foreign production becomes a more feasible alternative. Eventually, the firm may choose to produce abroad.

Risk and Control

Food manufacturers' investments in brand names give them an incentive to maintain the quality and reputation of their product. Failure to ensure a product's quality or reputation diminishes the value of brand and, therefore, the firm's investment. By exerting control over the production and distribution of their products, firms can maintain a consistent level of product quality, deliver their product in a timely manner, and respond quickly to consumer needs. Allowing another firm to gain control in either production or distribution of a branded good increases the potential for a loss in the value of the firm's brand or reputation.

The strategies available to firms allow for varying degrees of control over the production and distribution process. Both export and production by a wholly owned foreign affiliate yield the same level of control over the production process, but not of the marketing or distribution process. Export to a disinterested party in a foreign market holds no guarantee of correct product placement or delivery in a market. In the case of exports, control over the distribution process can be gained through distribution licensing arrangements, joint ventures, or wholly-owned distribution affiliates in the foreign market. The success of the licensing and joint ventures, however, depends on cooperation among the parties involved. By contrast, with ownership of a foreign affiliate, control over the production process generally coincides with control over the distribution process within the market.

Exercising control over production and distribution with licensing or joint ventures is more difficult given the involvement of a second party. Without a clear convergence of interests, disputes over product promotion, placement, quality, management, or the distribution of profits may arise. Of course, these problems can be avoided through appropriately structured agreements, but the difficulty of structuring and enforcing agreements to maintain the desired level of control often leads food manufacturers to use other methods. In some sense, therefore, the level of control offered by each strategy lies along a continuum, with wholly owned foreign affiliates providing the firm with the greatest control in a foreign market and exports providing the least.

In choosing among strategies, firms must balance their desire for control with the exposure to risk each strategy engenders. In general, foreign markets may pose greater risks than home markets because of a firm's lack of knowledge or experience with the culture, tastes and preferences, and business practices of a foreign market. Additional risks may exist in foreign markets characterized by economic or political instability, an insufficient infrastructure, or an unreliable or poorly trained workforce.

Among firm strategies, exports and licensing minimize the financial risk associated with foreign markets. In both cases, firms and their assets remain relatively insulated from foreign market risks. At the other end of the risk spectrum, ownership of a foreign affiliate and the financial investment it entails potentially exposes a firm to the greatest risk. Joint ventures, which require a lower financial commitment, fall in the middle of the spectrum depending on the extent of the firm's ownership of the joint venture.

Comparing risk and control considerations reveals a tradeoff faced by firms in choosing among strategies. Wholly owned foreign affiliates offer the greatest control over production and distribution but expose the firm to the greatest financial risk. Licensing, on the other hand, is a low-risk strategy but offers less direct control over both production and distribution. Exports, also a low-risk alternative, offer more control over production, but, in the absence of a distribution licensing agreement or joint venture, offer little

control over the distribution process. With respect to both risk and control, joint ventures remain in the middle of the spectrum.

As the degree of risk varies among markets and firms, so does the tradeoff between risk and control. For example, the political and economic stability of most Western European markets coupled with a fully developed infrastructure makes them considerably less risky than most markets in Latin America. Therefore, the tradeoff between risk and control for firms, regardless of their international experience, will be a smaller consideration in Western Europe than in Latin America. Alternatively, if a firm has substantial experience in Latin American markets, the tradeoff between risk and control will be smaller than that of firms with little or no experience.

As firms' knowledge of markets increases over time, the perception of risk changes, affecting the tradeoff between risk and control and, ultimately, the strategies firms choose. For example, firms that perceive a market as risky due to their lack of knowledge might initially avoid ownership of affiliates. Instead, they may choose exports, licenses, or a joint venture with low financial commitment to minimize their exposure to risk. As familiarity with the market increases, risk incurred from lack of market knowledge falls, and firms may move toward strategies that offer greater control, namely joint ventures and wholly owned affiliates.

The preceding discussion suggests that the optimal strategy for firms depends on product, firm, and market characteristics. For example, exports are more likely to occur for products with low delivery costs, products containing ingredients not readily available in the global market, products sold to nearby, risky, or low-sales markets, and or products sold by firms with little experience in foreign markets. The fewer of these characteristics possessed by the product, firm, and market, the more likely it is that the firm will choose production abroad as a long-term strategy.

This discussion also suggests that firms may use exports upon initial entry in a foreign market because of inadequate demand for their product or because market conditions and/or their inexperience make foreign production too risky. Over time, as these

situations improve—demand increases, market conditions improve, or firms gain more international experience—firms may switch from exports to foreign production. In this sense, foreign production substitutes for exports.

Multinational Firms

By compiling operating and investment data on multinational food firms, considerable insight is gained into the general patterns of the organization of multinational food manufacturers, their behavior in a global market context, and implications for U.S. policy. In the following sections, U.S.-based firms are described as a group. These data provide indirect verification of some of the previous observations on firm strategy. Additional support for those observations is found from an evaluation of firms based outside the United States.

U.S.-Based Multinational Food Manufacturers

The ERS firm-level data base of U.S. multinational food manufacturers provides data for 32 firms for the years 1988 to 1994 (table 23). Average annual shipments (sales) for these firms was $9.9 billion in 1994, up from $6.6 billion in 1988. Most firms are diversified with processed food sales accounting for 65 percent of total company sales in both 1988 and 1994. On average, 69 percent of processed food sales came from U.S. operations in 1994, down from 73 percent in 1988. Sales from affiliate operations in foreign countries grew from an average of $1.2 billion per firm to $2 billion in 1994. Average annual exports from U.S. operations were much smaller than affiliate sales, but increased rapidly from $85 million to $264 million per firm.

For all 32 firms, sales from their foreign affiliates grew at an annual average rate of 9.3 percent from $37.3 billion in 1988 to $63.6 billion in 1994 (table 24). FDI propensity, defined as foreign affiliate sales as a share of total food sales, rose from 27.1 percent to 31.1 percent (table 23). During 1988-94, FDI propensity increased for 25 of the 32 firms; only four firms had an absolute decline in foreign affiliate sales. For 15 firms, foreign affiliate sales exceeded

$1 billion. For all 32 firms, FDI sales averaged 7.5 times larger than their U.S. exports of processed food products. Still, exports from these firms' U.S. operations grew even faster than sales of foreign affiliates.

Exports from these firms' U.S. operations grew at an average annual rate of 20.8 percent from $2.7 billion in 1988 to $8.4 billion in 1994 (table 25). On average, exports as a percent of U.S. food sales, defined as export propensity, rose from 2.7 to 6.0 percent (table 23). In 1988, the export value for 18 of these 32 firms was less than 2 percent of their U.S. sales. By 1994, only one of firm's exports were less than 2 percent of sales. During 1988-94, export propensity increased for 28 of the 32 firms.

The data in tables 24 and 25 also provide insights into the dynamics of multinational corporations' foreign direct investment and export behavior. Earlier it was suggested that, in some circumstances, exports may be replaced by production abroad. The extent to which this behavior defines the relationship between firm exports and FDI might be verified, in part, through closer examination of the data. To that end, the 32 firms were divided into two groups on the basis of their sales of their foreign affiliates in 1988. The 18 firms in group I all had relatively high FDI propensities (over 15 percent of sales from foreign affiliates) in 1988. The 14 firms in group II all

Table 23—Average characteristics for 32 leading U.S. food manufacturing firms, 1988-94

	1988	1994
	Million dollars	
Value of total shipments (worldwide)	6,649.7	9,891.3
Value of total processed food shipments	4,301.0	6,394.7
As a percent of total shipments	64.7	64.6
Food shipments from U.S. operations	3,170.3	4,405.4
As a percent of total food shipments	73.7	68.9
Food shipments from foreign operations	1,166.4	1,987.7
As a percent of total food shipments	27.1	31.1
Processed food exports from U.S. operations	84.7	263.7
As a percent of U.S. food shipments	2.7	6.0

Source: ERS firm-level data base.

Table 24—Sales by foreign affiliates of U.S. food manufacturing firms, 1988 and 1994

Company	1988		1994		Growth in sales, 1988-94
	Sales	Share of total food sales	Sales	Share of total food sales	
	$1,000	*Percent*	*$1,000*	*- - -Percent- - -*	
Coca Cola Co.	4,319,234	54.0	11,080,000	68.5	156.5
Philip Morris Cos. Inc.	8,556,063	33.2	10,113,000	28.1	18.2
PepsiCo, inc.	2,030,000	24.9	6,339,400	35.3	212.3
CPC Int'l, Inc.	2,656,500	56.5	4,780,000	64.4	79.9
Heinz (H.J.) Co.	2,191,647	41.8	3,458,287	42.8	57.8
Kellogg Co.	1,762,216	40.5	2,721,200	41.5	54.4
Archer Daniels Midland Co.	183,555	3.0	2,665,504	26.6	1,352.2
Sara Lee Corp.	1,739,842	23.9	2,344,000	31.0	34.7
Campbell Soup	1,503,304	26.5	2,120,000	31.7	41.0
Dole Foods Co.	917,069	40.4	2,091,000	59.8	128.0
RJR Nabisco	2,981,000	30.2	1,970,000	25.6	-33.9
Quaker Oats Co.	1,584,200	35.1	1,926,500	32.4	21.6
Chiquita Brands Int'l	1,144,483	32.7	1,703,964	43.0	48.9
Con Agra Inc.	330,545	4.4	1,673,600	8.0	406.3
Ralston Purina	1,140,000	24.1	1,500,000	27.3	31.6
Anheuser Busch	514,974	6.0	909,200	8.0	76.6
Warner-Lambert	15,000	1.9	889,000	65.0	5,826.7
Borden Inc.	1,480,200	27.5	865,400	26.0	-41.5
Proctor & Gamble	73,705	2.5	810,000	24.6	999.0
Wrigley Co.	320,782	36.0	808,672	50.6	152.1
Multifoods	492,376	29.0	593,239	25.8	20.5
American Brands	2,000	0.5	507,200	40.0	25,260.0
Hershey Foods	199,401	9.2	482,116	13.4	141.8
McCormick & Co.	171,400	15.2	271,800	18.0	58.6
Pet Inc.	517,418	22.0	258,400	16.3	-50.1
General Mills Inc.	311,466	8.3	186,000	3.7	-40.3
Universal Foods	64,755	9.0	184,376	22.0	184.7
Gerber Products	36,931	7.0	126,194	15.1	241.7
Smucker (J.M.) Co.	16,843	4.6	66,092	10.5	292.4
Brown Forman	46,445	5.5	63,199	7.2	36.1
Clorox	4,612	2.0	54,759	11.0	1,087.3
Curtice-Burns Inc.	16,240	2.5	42,985	5.6	164.7
Total	37,324,206	27.1	63,605,087	31.1	70.4

Source: Economic Research Service, USDA.

Table 25— Food and beverage exports of U.S. firms with foreign affiliates, 1988 and 1994

Company	1988		1994		
	U.S. exports	Share of U.S. food sales	U.S. exports	Share of U.S. food sales	Growth in exports, 1988-94
	$1,000	*Percent*	*$1,000*	*- - - Percent - - -*	
Philip Morris Cos., Inc.	263,541	1.5	1,864,000	7.2	607.3
Con Agra Inc.	215,456	3.0	1,635,900	8.5	659.3
Archer Daniels Midland	978,968	16.5	919,860	12.5	-6.0
Anheuser Busch	282,378	3.5	731,800	7.0	159.2
PepsiCo Inc.	21,428	0.4	450,548	3.9	2,002.6
General Mills Inc.	73,940	2.2	305,000	6.3	312.5
Hershey Foods Corp.	39,372	2.0	238,061	7.6	504.6
Coca Cola Co.	93,932	2.6	235,000	4.6	150.2
Heinz (H.J.) Co.	61,051	2.0	208,746	4.5	241.9
Sara Lee (J.M.) Co.	38,369	0.7	184,000	3.5	379.6
Quaker Oats Co.	14,619	0.5	181,300	4.5	1,140.2
Campbell Soup	30,000	0.7	174,000	3.8	480.0
Ralston Purina	39,865	1.1	147,800	3.7	270.8
Kellogg Co.	42,679	1.7	131,355	3.4	207.8
Chiquita Brands Int'l	85,835	3.6	112,887	5.0	31.5
American Brands	13,818	3.5	106,000	13.9	667.1
Proctor & Gamble Co.	124,446	4.3	101,000	4.1	-18.8
RJR Nabisco	14,000	0.2	97,400	1.7	595.7
CPC International Inc.	30,652	1.5	82,524	3.1	169.2
Brown Forman Corp.	51,384	6.5	66,794	8.2	30.0
Dole Foods Co.	1,360	0.1	56,280	4.0	4038.2
McCormick & Co. Inc.	61,552	6.4	55,859	4.5	-9.2
Borden Inc.	21,872	0.6	49,300	2.0	125.4
Gerber Products Co.	5,385	1.1	48,565	6.8	801.9
Pet Inc.	24,335	1.3	45,100	3.4	85.3
Clorox	1,266	0.6	42,978	9.7	3,294.8
Wrigley (Wm. Jr.) Co.	4,851	0.9	37,425	4.8	671.5
Multifoods	12,056	1.0	34,038	2.0	182.3
Universal Foods Corp.	35,975	5.5	32,626	5.0	-9.3
Smucker (J.M.) Co.	7,350	2.1	26,985	4.8	267.1
Warner-Lambert Inc.	8,000	1.2	19,200	4.0	140.0
Curtice-Burns Inc.	11,189	1.8	16,073	2.2	43.7
Total	2,710,924	2.7	8,438,404	6.0	211.3

Source: Economic Research Service, USDA.

had relatively low FDI propensities in 1988 (less than 15 percent of sales from foreign affiliates).

From 1988 to 1994, FDI propensity rose for 13 of the 18 firms in group I. During this period, export propensity also increased for all but one of these 13 firms. Firms with simultaneous increases in both FDI and export propensities include: Coca Cola, with an increase in FDI propensity from 54 to 68 percent and an increase in export propensity from 2.6 to 4.6 percent; PepsiCo, with FDI propensity up from 25 to 35 percent, while its export propensity rose from 0.4 to 3.9; CPC International, FDI propensity up from 56 to 64 percent and export propensity up from 1.5 to 3.1 percent; Kellogg, FDI propensity up from 40 to 42 percent and export propensity up from 1.7 to 3.4 percent; Campbell Soup, FDI propensity up from 26 to 32 percent and export propensity up from 0.7 to 3.8 percent; and Sara Lee, FDI propensity up from 24 to 31 percent and export propensity up from 0.7 to 3.5 percent. McCormick started the period with higher than average exports, but saw its exports fall from 6.4 percent of sales in 1988 to 4.5 percent in 1994. All 5 of the 18 firms whose FDI propensities declined saw export propensities rise. For example, Philip Morris's exports rose up from 1.5 to 7.2 percent to become the largest exporter of processed foods among U.S. multinational corporations.

In group II, 13 of the 14 firms increased their FDI propensities—only General Mills had a decline, largely because it does not include sales from its international joint ventures in its annual report. Group II firms tended to have substantially larger export propensities in 1988 than group I firms. Exports as a percent of sales increased for 11 of these 14 firms during 1988-94. American Brands stands out as an example of rapid international expansion. This firm's FDI propensity rose from 0.5 to 40 percent while at the same time its export propensity increased from 3.5 to 13.9 percent. Widely diversified Con Agra nearly doubled its FDI propensity from 4.4 to 8 percent while exports as a percent of sales more than doubled from 3.0 to 8.5. Smuckers is an example of a much smaller multinational, which increased its FDI propensity from a modest 4.6 percent to 10.5 percent, while increasing its export propensity from 2.1 to 4.8 percent. Export propensity fell for three firms in group II,

but the decline was very small for two of the three. For Procter & Gamble, exports edged down from 4.3 to 4.1 percent of sales while FDI propensity rose substantially from 2.5 to 24.6 percent. Universal Foods' exports declined from 5.5 to 5.0 percent of sales. Export propensity by Archer Daniels Midland, the third largest exporter of these 32 firms, declined from 16.5 to 12.5 percent, while its FDI propensity rose from 3.0 to 26.6 percent.

While firms may find it beneficial to replace exports with production abroad in some circumstances, the preceding analysis does not confirm that this behavior dominates firm strategies. At the firm level of analysis, the data fail to show a decline in exports coincident with an increase in foreign affiliate sales.

Earlier discussion suggested that variations among regions and firms that lead to different strategic choices should also result in different patterns of plant ownership. Regions characterized by low risk, high delivery costs, easily available ingredient inputs, and potential demand that will allow firms to achieve economies of scale should also be characterized by a high degree of plant ownership (e.g., EU and North America). Similarly, firms with high levels of international experience should be involved in more foreign markets and possibly have greater exposure in markets perceived as risky by less experienced firms. One would also expect firms involved in the production of goods that require a large portion of unprocessed agricultural commodity as inputs to locate in foreign markets when those markets exhibit a comparative advantage in commodity production.

Canada and Mexico, in which 33 firms have affiliates, and Europe, with affiliates of 30 firms, have proved to be the most attractive regions for investment based on plant locations for 39 U.S.-based multinational food manufacturers in 1993; Africa and the Middle East prove the least attractive (table 26). Though the distribution of plants is heavily weighted to North America and Europe for all firms, differences in levels of international experience affect the distribution of ownership among regions. Sixteen firms own 10 or fewer foreign plants. Plant ownership of these firms outside the United States, Canada and Mexico is limited; the number of

Table 26—Geographic location of select U.S. multinationals' processed food plants (1992-1993)—Cont.

Company	Foreign	U.S.	Total	Canada & Mexico	Other Americas	European Community	Other Europe	Asia Pacific	Africa	Middle East
					Number of plants					
Dole Foods Co.	12	15	27	0	5	4	0	3	0	0
Intl Flavors & Fragrance Inc.	12	4	16	1	2	5	1	3	0	0
Pet Inc.	11	20	31	3	1	4	0	3	0	0
Seaboard Co.	10	9	19	0	8	0	0	0	2	0
Wrigley (Wm. Jr.) Co.	10	7	17	2	0	2	1	4	1	0
Anheuser Bush Cos. Inc.	9	80	89	0	0	9	0	0	0	0
Chiquita Brands Int'l Inc.	6	4	10	1	5	0	0	0	0	0
Hershey Foods Corp.	6	9	15	2	0	3	0	1	0	0
Warner-Lambert Inc.	6	5	11	1	1	3	0	1	0	0
Grace (W.R.) & Co.	5	4	9	1	0	4	0	0	0	0
Bristol Myers Squibb	3	3	6	1	0	2	0	0	0	0
Smucker (J.M.) Co.	3	12	15	1	0	1	0	1	0	0
Brown-Forman Corp.	2	6	8	1	0	1	0	0	0	0
Curtice-Burns Inc.	2	34	36	2	0	0	0	0	0	0
Gerber Products Co.	2	3	5	0	1	0	1	0	0	0
Clorox	1	5	6	1	0	0	0	0	0	0
Dean Foods Co.	1	57	58	1	0	0	0	0	0	0
General Mills Inc.	1	30	31	1	0	0	0	0	0	0
Procter & Gamble Co.	1	16	17	0	0	1	0	0	0	0

Table 26—Geographic location of select U.S. multinationals' processed food plants (1992-1993)—Cont.

Company	Foreign	U.S.	Total	Canada & Mexico	Other Americas	European Community	Other Europe	Asia Pacific	Africa	Middle East
					Number of plants					
Dole Foods Co.	12	15	27	0	5	4	0	3	0	0
Intl Flavors & Fragrance Inc.	12	4	16	1	2	5	1	3	0	0
Pet Inc.	11	20	31	3	1	4	0	3	0	0
Seaboard Co.	10	9	19	0	8	0	0	0	2	0
Wrigley (Wm. Jr.) Co.	10	7	17	2	0	2	1	4	1	0
Anheuser Bush Cos. Inc.	9	80	89	0	0	9	0	0	0	0
Chiquita Brands Int'l Inc.	6	4	10	1	5	0	0	0	0	0
Hershey Foods Corp.	6	9	15	2	0	3	0	1	0	0
Warner-Lambert Inc.	6	5	11	1	1	3	0	1	0	0
Grace (W.R.) & Co.	5	4	9	1	0	4	0	0	0	0
Bristol Myers Squibb	3	3	6	1	0	2	0	0	0	0
Smucker (J.M.) Co.	3	12	15	1	0	1	0	1	0	0
Brown-Forman Corp.	2	6	8	1	0	1	0	0	0	0
Curtice-Burns Inc.	2	34	36	2	0	0	0	0	0	0
Gerber Products Co.	2	3	5	0	1	0	1	0	0	0
Clorox	1	5	6	1	0	0	0	0	0	0
Dean Foods Co.	1	57	58	1	0	0	0	0	0	0
General Mills Inc.	1	30	31	1	0	0	0	0	0	0
Procter & Gamble Co.	1	16	17	0	0	1	0	0	0	0

foreign-owned plants exceeds U.S.-owned plants for only two of the firms and only seven operate plants outside North America and Europe. By contrast, for the 16 firms with 20 or more foreign plants, five firms own more foreign than U.S. plants. Fourteen of these firms own plants outside North America and Europe; nine firms own plants in four or more regions. These 16 firms account for most of the plants owned in Latin America, Asia, Africa, and Eastern Europe, and all the plants in the Middle East.

Table 26 also illustrates the role that agricultural commodity input sometimes plays in plant location. Specifically, Chiquita and Seaboard locate 80 percent or more of their foreign processing facilities in Latin America and the Caribbean. Dole locates a majority of foreign processing facilities, 67 percent, in Latin America and Asia. Not coincidentally, each firm processes goods with a substantial component of a commodity ingredient that is well suited to the growing conditions in these regions.

Foreign-Based Multinational Food Manufacturers

To gain insights into the organization and market behavior of multinational food firms based outside the United States, Henderson, Vörös, and Hirschberg (1996) compiled data for a panel of the world's leading non-U.S. firms with food-manufacturing operations. While this panel is not necessarily a representative sample of non-U.S. food-manufacturing firms, it does include many of the leading firms that account for a significant share of processed food production in industrialized countries other than the United States. To provide a measure of the extent to which this panel depicts the food-manufacturing industry outside the United States, its share of total output of manufactured food is estimated (table 27). While not a statistically reliable sample, the firms in the panel appear to provide a reasonable representation of the industry in most of the industralized world.

These are large firms; in the base period annual shipments or turnover averaged $3 billion, total assets averaged more than $2.3 billion, and firms employed on average more than 21,000 workers (table 28). Even though many of the firms are diversified, food

manufacturing appears to be their major business. Of their annual turnover, 75 percent is manufactured food and beverage products. Of their food and beverage products, on average 45 percent is manufactured in the firms' home countries; the remaining 55 percent is produced by affiliate operations in foreign countries. For the group as a whole, food operations account for 69 percent of the firms' total operating income, somewhat less than the product share.

Of the firms in the panel, 89 percent reported foreign operations; the remaining 11 percent reported operations only in their home market. Firm size appears to be associated with the extent to which a firm is multinational; for example, firms with foreign operations averaged $2.8 billion in annual food sales compared with $488 million for firms with no operations outside their home countries. Similar size comparisons exist when measured in terms of assets and employees.

Non-U.S. multinational food-manufacturing firms appear to adhere to the pattern, described earlier, of investing in foreign affiliate operations to exploit firm-specific advantages such as brand names and unique types or varieties of products. On average, the firms in the panel owned more than 38 food product brand names, operated in slightly more than 5 major food industries (defined at the U.S. 4-digit SIC level), and held more than 23 percent of their total assets in the form of intangibles such as brand names, corporate goodwill, and other firm-specific intellectual property (table 29).

A comparison of the multinational firms in the panel (firms with some foreign affiliate operations) that operate in the United States

Table 27—Shipments by the panel of leading non-U.S. food-manufacturing firms: Geographical coverage (circa 1990)

Region	Number of firms	Annual shipments	Share of region's total shipments
	Number	*$Million*	*Percent*
European Union	62	145,252	32.3
Japan	15	42,501	16.6
Other OECD	28	63,806	29.6
Rest of world	8	4,914	NA

Source: Henderson, Vörös, and Hirschberg, 1996.

with those that have no U.S. affiliates reveals some pronounced differences (table 30). Overall, firms with U.S. affiliates are substantially larger than those with no U.S. operations: they have twice the average value of total corporate assets and twice the average annual value of total corporate sales. Further, non-U.S. multinational firms with U.S. affiliate operations are more oriented toward foreign operations in total. Shipments from all foreign operations accounted for 58.3 percent of total sales by these firms compared with 46.5 percent for firms with no U.S. affiliates. Further, for the firms with U.S. affiliates, shipments from their U.S. operations accounted for nearly half (45.1 percent) of all foreign operations. These observations suggest that firms with U.S. affiliates concentrate a greater proportional effort in one foreign market, the United States, than do other non-U.S. multinational food manufacturers.

In terms of corporate specialization, non-U.S. multinational food manufacturers with U.S. affiliate operations are somewhat less diversified into nonfood business than are those with no foreign

Table 28—Characteristics of the panel of leading non-U.S. food-manufacturing firms (circa 1990)

	Mean	High	Low
		Million dollars	
Food and beverage operations			
Value of shipments	2,253.2	28,103.7	100.7
Operating income	216.4	1,637.4	0.9
Shipments from home country operations	1,017.6	4,750.6	42.7
Shipments from foreign operations	1,235.6	27,568.4	0
Foreign shipments as a percent of total	54.8	98.1	0
Consolidated operations			
Value of shipments	3,017.7	36,254.3	110.8
Operating income	314.6	3,332.1	1.0
Net income	162.7	1,799.2	-33.4
Total assets	2,621.1	21,576.4	35.7
Number of employees	21,070	300,000	335

Source: Henderson, Vörös, and Hirschberg, 1996.

operations in the United States. For example, food accounts for about 83 percent of total sales for the firms with a U.S. presence compared with just 73 percent for the others. This may suggest that, for a foreign firm to successfully operate food-manufacturing facilities in the United States, in addition to being large it must focus a substantial part of its business on food.

With regard to corporate earnings, however, differences between foreign firms with and without U.S. affiliates disappear. There is virtually no difference in corporate operating margins between the two sets of firms, and overall return on total assets is about equal. This implies that decisions by non-U.S. food-manufacturing firms to acquire or develop affiliate operations in the United States are based primarily on the firm's ability to compete in the United States—determined in part by its degree of specialization in food and the size of its corporate resources—more so than on the opportunity to extract extraordinary profits from the U.S. market.

Similarities Among Multinational Food Firms

Regardless of the nationality or headquarters location, international market behavior of multinational firms in the processed food sector is remarkably similar. While non-U.S.-based multinational firms appear to have a greater orientation to foreign markets than do U.S.-based firms (when measured by the share of total sales originated in foreign affiliate operations or sold as exports from the home country), sales from foreign operations are of significantly greater importance than are exports, irrespective of nationality. For non-U.S. multinationals the ratio of FDI-related shipments to

Table 29—Firm-specific intellectual properties of leading non-U.S. multinational food-manufacturing firms (circa 1990)

Item	Average
Number of food product brands	38.2
Number of food manufacturing industries	5.1
Number of Brands/industry	7.5
Intangible assets as a percent of total assets	23.1

Source: Henderson, Vörös, and Hirschberg, 1996.

exports is about 4-to-1; for U.S. multinationals in the comparable time period it was about 9-to-1 (table 31).

Export behavior appears to be more a function of the geographic location of production facilities than the nationality of the firm. The U.S. Department of Commerce, BEA data on foreign direct investment show, for example, that foreign affiliates of U.S. food-processing firms are more export-oriented than are their U.S. operations. On average, U.S. parent firms export about 4 percent of the output from their home country facilities, whereas exports average 19 percent of the output of their foreign affiliates (BEA 1995A). Further, exports as a share of total shipments vary widely among foreign affiliates of U.S. firms. Those located in Canada, for example, exported an average of about 5 percent of their output, paralleling all Canadian food processors, while exports of those located in the European Union averaged 25 percent, again similar to

Table 30—Operating characteristics of non-U.S. multinational food-manufacturing firms in the U.S. and elsewhere (circa 1990)

Item	Unit	Firms with U.S. operations	Firms with no U.S. operations
Assets			
Average total assets	$million	5,148.6	2,124.9
Shipments			
Average total sales	$million	5,427.4	2,329.0
U.S. shipments/total shipments	percent	26.3	0
U.S. shipments/ foreign shipments	percent	45.1	0
Foreign shipments/ total shipments	percent	58.3	46.5
Specialization			
Food shipments/ total shipments	percent	83.1	73.2
Earnings			
Operating income/total sales	percent	9.5	9.5
Net income/ total assets	percent	5.8	6.0

NA = Not applicable.

Source: Henderson, Vörös, and Hirschberg, 1996.

the export performance of all EU-located food processors (fig. 6).

Similarly, exports as a share of total shipments for U.S. affiliates of non-U.S.-based multinational food-processing firms averaged about 5 percent, only marginally higher than the average for home operations of U.S.-based multinationals and well below the 12.6 percent average for non-U.S. firms across all geographic areas. Further, much of the trade by U.S. affiliates of non-U.S. multinationals is intra-firm: 48 percent of their exports was shipped to foreign parents, and foreign parents originated 58 percent of the imports received by their affiliate operations in the United States (BEA 1995B). Thus, the relative importance of exports to third-party buyers appears to be not much different for foreign-owned food-processing operations in the United States than for other U.S. plants.

Multinational food manufacturers also make considerable use of international licensing. Perhaps the most is known about international brand name licensing. In a survey of 120 of the world's largest food-manufacturing corporations, Henderson and Sheldon (1992) found that at least half of those with international operations engaged in some form of international product or brand-name licensing. Based on anecdotal evidence, they suggested that the total value of international sales of licensed food products exceeded that of direct product trade. U.S. and non-U.S. multinationals appear to be equally aggressive in brand-name licensing; among the well-known U.S.-owned names licensed to firms abroad are Ocean Spray, Spam, Budweiser, and Kraft; among those owned by non-U.S. firms are Almond Joy, Killian's Red, Lipton, and Toblerone.

Table 31—Foreign operations of the world's leading multinational food manufacturing firms (circa 1990)

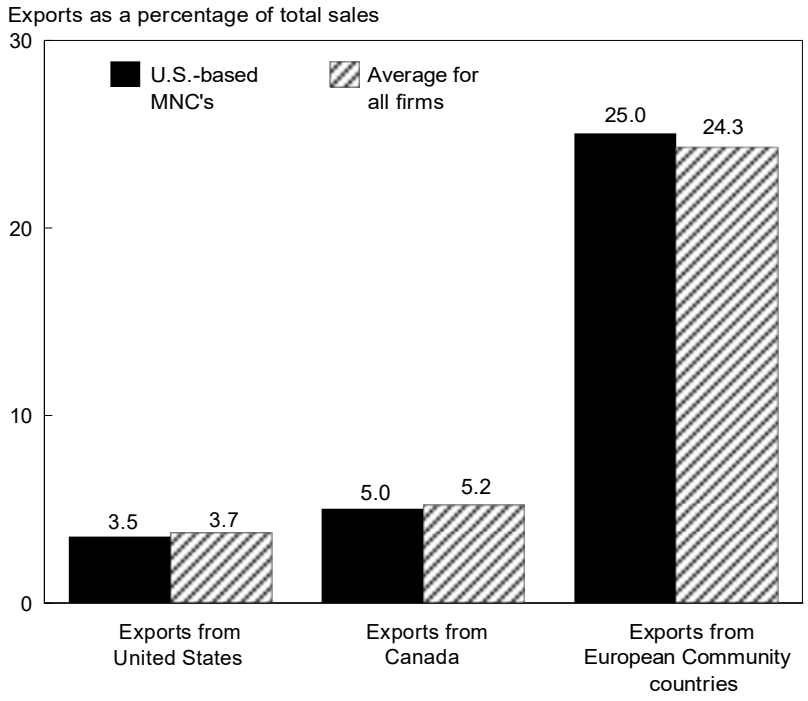
Item	U.S. firms	Non-U.S. firms
	Percent	
Shipments from foreign affiliates as a percent of total sales	27.0	54.8
Exports from home country as a percent of total sales	3.0	12.6

Source: Henderson, Vörös, and Hirschberg, 1996.

Henderson and Sheldon's interviews with executives of firms engaged in international licensing reveal that this strategy is often used in situations where a substantial investment in firm-specific intangible assets exists, for example, a heavily advertised brand name (for example, Budweiser), or a unique and well-accepted product characteristic (for example, Coca-Cola), but where direct trade is constrained by such things as bulky (like water) or highly perishable (like milk) ingredients or by trade restrictions such as tied distributors or import quotas. Licensors view it as a means of geographic market extension; licensees view it as a means of product line extension. Licenses are often linked to product-specific technology, for example, caramelized chocolate bars or cold-filtered draft beer, as a means for the product developer/licensor to maintain an equity position in the product once the licensee masters the production technology.

Figure 6

U.S. exports and foreign affiliate sales of processed food



Source: Henderson and Handy, 1994.

Licensing is also sometimes linked to other international market behavior. Executives of multinational firms frequently discuss it as an intermediate strategy between direct product trade and direct foreign investment. Further, licenses often provide for the supply of critical ingredients by the licensor, such as cola syrup or chocolate paste, thus facilitating trade in such intermediate products.

Many multinational firms extend their international activities through joint ventures. The formation of a joint venture by General Mills and Nestlé to produce and market ready-to-eat breakfast cereals in Western Europe and other non-U.S. markets in direct competition with market leader Kellogg generated substantial interest in this phenomenon. Yet, few examples of long-standing joint ventures in the food sector can be found. A study of joint ventures across all industries involving U.S. firms found that their average life was just 3.5 years (Harrigan 1988). Specific to the food industries, a study of joint ventures in the Canadian food-processing sector found that of 110 such entities in existence sometime between 1981 and 1988, 33 percent were created and 38 percent were dissolved during that period (Geringer 1990).

The Relationship Between Trade and Foreign Direct Investment

Given the current U.S. policy of increasing the export of high-value agricultural products, an important issue is whether multinational firms' global strategies generate or displace exports from the home country. The analysis presented earlier provided some insight on this issue by comparing sales growth of exports and foreign affiliate between 1988 and 1994. While this provides some evidence of the relationship between exports from the home country and foreign affiliate sales, it does not address directly the time-dependent relationship between exports and alternative strategies. More specifically, it does not establish a causal relationship and, therefore, it cannot answer the question of whether foreign direct investment by food manufacturers leads to an increase or decrease in the export of processed food products.

Anecdotal evidence provides support for both the displacement and creation of exports from foreign direct investment. As discussed above, firms may use exports to enter a market but eventually move to foreign direct investment. This strategy suggests that foreign direct investment displaces exports. For example, CPC initially entered the South American market for salad dressing by exporting from the United States. As CPC's market presence grew, it became more cost effective to build a modern plant in South America rather than export from the United States. Alternatively, increased foreign direct investment may generate trade for several reasons. First, foreign affiliates may not produce all of a firm's product line. Exports will then be used to "fill-in" the product line of the foreign affiliate. Second, the foreign affiliate may make it easier for the firm to recognize and respond to new export opportunities in neighboring countries. Further, firms can exploit trade opportunities with their foreign affiliates.

Some sense of the relationship between exports and sales of foreign affiliates can be gained by examining the effect of past growth in exports on the current growth and level of foreign affiliate sales and the effect of past growth in foreign affiliate sales on the current growth and level of exports. This approach provides insight on the extent to which firms lead FDI with exports or vice versa and, as a result, whether FDI creates or displaces exports. Correct evaluation of this phenomenon requires firm-level data on individual products and foreign markets. Because these data are not available, Malanoski, Handy, and Henderson (1995) used two sets of data on trade and FDI to investigate the time-dependent relationship between the two strategies. The first data set consists of U.S. Department of Commerce data on trade and foreign affiliate sales in processed foods (SIC 20). The second data set uses ERS firm-level data. In neither case were they able to find evidence of either export displacement or creation from foreign affiliate sales. They did find evidence, however, that exports may serve as a precursor to foreign direct investment.

Malanoski, Handy, and Henderson also explored the extent to which differences among countries affect the relationship between exports and FDI. As discussed above, use of exports, foreign affiliates, or

other strategies varies among products, firms, and countries. Indirect evidence from firms' plant locations also suggests that both regional and firm characteristics affect firms' choices. Comparing OECD and non-OECD countries, they found that past growth in sales of foreign affiliates is negatively related to the current level of exports for OECD countries; for non-OECD members, the relationship is positive. In addition, past growth in exports is negatively related to current levels of FDI for OECD members, but positively related for non-OECD member countries. In general, the relationship between FDI and exports for OECD members was found to be competitive, while the relationship for nonmembers was complementary. These results suggest that FDI displaces exports in highly developed industrial countries (OECD members) and creates exports from the less-developed (nonmember) countries.

The dichotomous results for OECD and non-OECD members were also found when countries were grouped by region. The results for Central and South American countries mimic those of non-OECD members. The results for Western Europe and Canada mimic those of the OECD members, except that no significant relationship was found between past growth in foreign affiliate sales and current exports for the Western Europe group. The results for the Asia/Pacific region are also similar to those for non-OECD members. As with the Western Europe region, however, no significant relationship was found between past growth in foreign affiliate sales and current exports.

Using firm level data, Malanoski, Handy, and Henderson examined four aspects of firms—product diversity, advertising intensity, firm size, and international experience—to determine if the time-dependent relationship between trade and FDI differed among firms. For each characteristic, the sample was subdivided into two groups and the results compared. They found a positive relationship between past growth in FDI and current exports for the groups classified as highly diverse and large. The results for product diversity provide some support for the premise that FDI generates exports to "fill in" product lines of foreign affiliates. Because it may be infeasible for foreign affiliates to replicate a highly diverse product line, it is more likely that highly diverse firms use exports

to “fill in” product lines after the establishment of a foreign affiliate. No other group provides indication of FDI either creating or displacing exports.

In another study, Overend, Connor, and Salin (1995) explored the relationship between exports and FDI over time for six food-manufacturing firms. They discovered three disparate patterns among the firms: two companies display complementary export-FDI strategies; two display a strategy of substitution between exports and FDI; and two display no relationship between exports and FDI. Though their sample is small, their results also suggest that the export-FDI relationship is ambiguous.

Although neither the Malanoski, Handy, and Henderson nor the Overend, Connor, and Salin studies is definitive, neither supports the presumption of substitution between exports and foreign affiliates as the predominant paradigm for multinational firms.

Multinational Behavior in Perspective

Global marketing of processed foods is primarily the undertaking of multinational firms with food-manufacturing and/or distribution operations. Principal strategies used for accessing foreign markets are exporting from home market facilities and producing abroad in affiliated works. Firms also use a variety of strategies to serve foreign markets in cooperation with foreign—usually host country—firms. Such strategies include licensing a foreign firm to produce under the originating firm’s brand or technology, operating jointly owned manufacturing/distribution facilities, and forming strategic alliances with foreign partners.

Generally received theories of firms and international trade tend to yield ambiguous predictions regarding the actual behavior of different firms, or firms in different countries. Indeed, discussions with executives of leading firms both in the United States and elsewhere suggest that firms approach international markets in a pragmatic, but often seemingly eclectic, manner. Even so, actual observations of the organization and behavior of multinational firms, combined with country-level data on processed food exports

and production under foreign affiliation, yield some empirical regularities, or general principles:

• Firms demonstrate a preference for serving foreign markets for processed foods through production in affiliated facilities located in the host country (FDI), rather than by exporting from home-country facilities. This preference is not country-specific, but is demonstrated with more-or-less similar intensity by firms regardless of their home-country affiliation.

• The propensity for firms to serve foreign markets through foreign affiliates does not necessarily result in a reduction of the firm's exports, nor is there evidence that the existence of foreign affiliates displaces exports.

• The choice of firms' methods of supply depends on product, firm, and market considerations. A firm's strategy to enter a foreign market is difficult to predict but often emphasizes exports from its home country in early stages, giving way to affiliation with host country operations in latter stages.

• There is no evidence of a consistent functional industry-wide relationship (either positive or negative) between FDI and trade. Many specific examples can be cited to document a substitution effect, other examples confirm a complementary effect, while still other examples show no relationship. Thus, generalizations should be treated with caution.

PART II: Emerging Policy Issues

The five chapters in Part II examine some policy-related issues that influence patterns and trends in the globalization of the processed-foods sector. Chapter 5 discusses technological advances in two key infrastructural sectors, communications and transportation, relates these to global commerce in foodstuffs, and demonstrates the impacts of domestic deregulatory policy. Chapter 6 examines the interrelationships between international trade policies, in particular multilateral trade agreements such as the World Trade Organization and the North American Free Trade Agreement, and patterns of global food marketing. Chapter 7 addresses efforts to achieve international accord on national policies dealing with food process and product standards and related regulations and delineates how resolution of national differences influences the evolution of global patterns of commerce. Chapter 8 examines the case for multinational agreement on policy issues related to protection of environmental quality and investigates the incentives and costs to the food sector in bringing about greater international convergence. Chapter 9 discusses national public policies that influence the creation of intellectual property and international policies that protect firms' related investment in intellectual property, investment that is critically related to the relative importance of a nation's firms in the global market for processed foods.

CHAPTER 5
Transportation and Communications

In Chicago in 1865, a bushel of wheat sold for about 60 cents, while in London that bushel sold for $1.20; the difference reflected the costs of getting the wheat from Chicago to London, first to the Atlantic coast via rail or Great Lakes shipping, and then to London via ship, with provision made for storage at the several links in the transport chain (Harley, 1980). Of course, the wheat was not grown in Chicago, so the Chicago price already reflected the costs of transportation and storage between the grower and Chicago. Transport and storage costs accounted for most of the price of the product at the consumption point in London.

Between 1865 and 1900, transport rates between Chicago and London fell to 10 cents a bushel, because of dramatic improvements in the technologies of transportation (as larger, faster, steam-driven ships replaced smaller, slower, sail-driven ships and as successive generations of larger and faster trains were introduced). Transportation improvements allowed for lower food prices and increased consumption in European cities, higher prices at the farm, expanded areas of grain production, a wider margin of western settlement in the United States, and improved access to durable manufactured goods in those settlements. Those western settlers had left other regions; improved transportation to fertile farmland of the Corn Belt and Eastern Great Plains led to reduced use of hilly and less productive farmland in the Northeast.

Innovations in Transportation and Communications

Today, transport costs are less important barriers to global trade, precisely because of the dramatic improvements made over time. But innovations continue to reduce real transportation costs for most modes, products, and regions, thereby reducing the economic distance among countries, and gradually increasing trade flows.

Moreover, recent improvements in telecommunications and in transportation quality allow for faster and more reliable transit, and thereby expand the range of sensitive and perishable value-added goods that can be traded in a global economy. For example, freight trade between Asia and Europe commonly moves via large containership to the U.S. West Coast, then onto "doublestack" container trains across the country to the East Coast, and finally aboard ship for transit to Europe. This innovation allows for the use of very large (lower cost) ships that could not pass the Panama or Suez canals (Muller, 1988). By shortening transport distance, this innovative use of container shipment also improves service quality (reducing transit times) while reducing costs and rates.

The prime benefit is consolidation of container traffic at U.S. ports, thereby making larger, faster ships and trains available for international and domestic U.S. trade, which in turn provides new trade opportunities. Today, U.S. exports of chilled beef move across the country on refrigerated container trains, to be transferred to ships for movement to Japan (James, 1992). New developments in refrigeration technology allow the beef to remain fresh while being shipped at a fraction of the air freight cost.

Total transit time of 2 weeks would not have been possible a decade ago, before dense container flows allowed the use of frequent train and ship departures. But trade is also dependent upon improved communications technologies, principally the electronic retention of information and low-cost reliable transmission of voice and data communications.

Shipment of chilled beef requires precise coordination among several enterprises, from the slaughterhouse to a trucker, then onto a railroad, through a port, onto a ship, through a Japanese port, and onto truck again before final delivery. Improved communications technologies allow shippers to tailor perishable shipment volumes and delivery dates to the precise immediate needs of importers; to rapidly shift movement among alternate routes and modes to avoid congestion; to electronically track the progress of the shipment to avoid loss or delay; and to rapidly coordinate the associated information and payment flows among the parties.

Improved communications technologies allowed shippers to take advantage of the large declines in rail shipping costs in the United States in the 1980's (average real rates fell by 40 percent between 1980 and 1994). Costs fell because railroads succeeded in consolidating traffic into larger, more intensively utilized trains and onto densely traveled mainlines. Such consolidation allows railroads to move freight with far less equipment, track, and labor. In turn, railroads were able to consolidate traffic because regulatory reforms (The Staggers Rail Act of 1980 and The Shipping Act of 1984) gave carriers the opportunity to develop a set of pricing tools that gave shippers strong financial incentives to consolidate freight flows (MacDonald and Cavalluzzo, 1996).

Consolidation means that railroads offer reduced services to points off the mainline. In recent years, trucks have continued to pick up more of that short-haul service along more lightly traveled routes. Truckers of large shipments (truckload carriers) have increasingly acted as "spokes" in joint ventures with railroads, amassing freight at a hub for long distance rail shipment to a distant hub, with truck distribution to users. By massing containers at a small number of major hubs, railroads can offer frequent departures of high-speed trains between hubs. By relying on trucks for initial consolidation and final distribution, shippers can obtain flexible service at lower rates.

The container traffic examples offered above emphasize ship, rail, and truck moves. Yet, processed food products increasingly move among countries by air. In 1980, ships carried 55 percent of U.S. exports (measured by value), and airplanes carried 21 percent. By 1993, planes accounted for 29 percent of exports and ships for 36 percent, with surface transport to Canada and Mexico accounting for the rest. Air freight's share of imports grew from 12 to 21 percent from 1980 to 1993 (Eno Transportation Foundation, 1994). Growth in air freight reflected a shift in trade toward lower-weight, higher-value products (for example, from feed corn to chilled shrimp), but developments in air freight also encouraged the expansion of that trade. Deregulation in the United States led to lower costs, as it allowed airlines to restructure route networks for greater utilization and easier entry and exit. More competition and

lower cost reduce fares (and fare reductions feed back to increased utilization, and often, even lower unit costs).

Each of these innovations consists of three components. First, there are ongoing improvements in the technology of transportation: more powerful and efficient units; larger, lighter, better-constructed, freight-carrying units; and faster, more capacious loading and unloading equipment at terminals.

Second, innovations in management occur when firms recognize new ways of organizing existing technology to move freight. Examples include the initial steps toward containerization of freight as well as the ongoing actions to extend the idea; the development of aircraft hub-and-spoke systems for passenger and freight service, as well as the extension of the concept to rail and ships; and the initiation of joint ventures among transport firms from different modes, aimed at providing shippers with "seamless" long-haul service.

Third, government policies influence the opportunities for innovation. Examples include investments in port, terminal, and roadway facilities; procurement policies that influence the development of new carrier technologies (particularly for aircraft); and regulatory policies that affect private pricing and investment decisions. The latter have come into increased prominence since the late 1970's, when the United States introduced major regulatory reforms in airlines (1978), railroads (1980), trucking (1980), shipping (1984), and telecommunications (beginning in 1984).

Privatization, Regulation, and Technology

Some of our major trading partners have embarked on privatizations of state-owned firms, including Japan (telecommunications, airlines, and railways) and the United Kingdom (telecommunications and airlines). Governments in Chile, Argentina, Mexico, and Venezuela have privatized state-owned airlines and telephone monopolies (OECD, 1992; Kikeri, Nellis, and Shirley, 1992). The principal goals of privatization include lower operating costs, expanded investment in infrastructure, and improved service. But because

privatized telecommunications and transport firms are often monopolies, privatization carries a risk of substantial price increases. In consequence, privatizing governments often introduce regulatory programs that aim to include incentives for efficient pricing, investment, and operation, while constraining the realization of monopoly power.

While introducing regulatory schemes for privatized monopolies, many governments have been relaxing restrictive regulations in competitive industries, such as trucking. Indeed, between 1975 and 1990, Austria, Canada, Denmark, Finland, France, Ireland, Japan, New Zealand, Norway, Spain, Sweden, and Turkey all introduced regulatory reforms in trucking. In most cases, the reforms allowed for easier entry and more flexible pricing, and ought to lead to declines in prices, an expanded range of services, and lower costs.

Communications costs have also declined steadily in response to continuing technological change and, more recently, regulatory changes in both developed and less developed countries. Improvements in switches (which are essentially computers and hence show the same sorts of development) and in transmission media (with the diffusion of fiber optics) have led to sharp declines in the costs of traditional landline telecommunications services. Falling prices and innovative new uses for telecommunications have led to exploding demand. Between 1984 and 1992, interstate calling within the United States increased by 135 percent (measured by minutes of calling), while the volume of international calling in and out of the United States grew by 235 percent. Newer communications technologies, such as the radio-based use of pagers, cellular phones, and other mobile technologies, have grown even faster. By 1993, mobile technologies accounted for 10 percent of all revenues of telecommunications companies (FCC, 1995).

Improvements in communications allow for more reliable monitoring of distant transactions. Most important for communications, as in the transportation examples, is not just that the costs of existing ways of doing business are reduced, but that communications improvements create opportunities for new ways of providing services. If congestion or weather blocks traffic on a

route, transport firms can more easily identify and reroute high-priority goods with the help of instantaneous communications. The resulting flexibility makes for far more reliable long-distance transportation of perishable and other time-sensitive items, and in some cases creates international markets in those items. The newer communications technologies also allow for rapid delivery of information between a producer and an ultimate distributor; that information may be very time-sensitive information relating to consumer demands or to inventory depletion. By allowing virtually instantaneous communication and response, the new communications technologies allow producers to respond much more quickly and complement new transport technologies in creating international markets.

Transport and communications costs continue to fall in real terms. They fall because of the combined effects of technological improvements, organizational and managerial innovations, and investment in public facilities. Government regulatory and ownership policies can limit or encourage the productivity improvements that underlie efficiency improvements.

Declining real costs generally lead to declining real prices. In turn, opportunities for trade are expanded because the prices of existing traded goods fall, but also because it becomes feasible to initiate trade in products that previously were considered local. Among foods, bulk grain and oilseed products (such as flour and soybean meal) have long been traded among countries. But improvements in refrigerated containers, and in the methods of moving them, have allowed for wider trade in processed foods such as meat and dairy products as well as for the development of widespread year-round markets in fresh and chilled food products.

Transport improvements do not occur at the same pace throughout the world. Recent rail and ship improvements primarily affect the major routes linking the world's industrialized economies. There, major port and terminal investments, and enormous flows of goods, allow for the realization of scale economies through the use of larger vessels and trains. These sorts of improvements allow for greater trade in bulk products. Poorer countries rarely possess the

infrastructure or traffic flows to allow the use of these technologies; nor are they likely to obtain them in the future. But it is possible to develop dedicated airfreight terminals with much more modest bases of investment and traffic flows. Consequently, recent technological developments in transport favor trade in higher-value products (perishables and highly processed food products) with low-income partners.

Communication Technology and Foreign Direct Investment

The discussion thus far emphasizes trade. But continuing developments also influence the possibilities for foreign direct investment, which has historically accounted for most foreign food sales by U.S. companies. Through the early 1980's, grain and oilseed products accounted for the dominant share of U.S. exports of agricultural and food products. Global transactions for those products tended to be "arms-length" in that U.S. exporting firms traditionally sold to independent foreign importing firms. One could then be a major exporter without having a major physical presence in a foreign country. Exports of branded, more highly processed food products were relatively unimportant, although that did not mean that U.S.- branded products firms had no overseas interests. The larger U.S. firms have long had significant overseas interests, but those interests have traditionally taken the form of foreign direct investment, rather than exports.

Companies such as Sara Lee or General Mills, when selling branded products overseas, clearly are not manufacturing all of those products in the United States, nor many of the resources embodied in them. Rather, those firms have exported their expertise to other countries. In this context, the term "expertise" primarily means skilled managers. U.S. firms operating overseas affiliates replicate, in important ways, the methods used in the parent: these include large-scale production facilities, with associated large and steady flows of raw product, the design and use of sophisticated financial controls, the distribution of large volumes of processed

product to retail concerns, and the pricing and advertising of the processed product.

Transfer of management skills under FDI has traditionally had to satisfy three criteria to make economic sense. The skills must have some applicability in the new culture (hence FDI in consumer products concentrates in countries that are close to the host country, spatially, linguistically, or culturally). Parent firms must have some reliable means of monitoring performance. And, particularly if the FDI requires that a significant investment be made, the investment should have a low risk of expropriation.

Recent technological developments influence the performance-monitoring criterion primarily, with some additional influence on cultural adaptability. Improved quality and lower costs of telecommunications allow for more frequent and reliable flows of voice, data, and document communications between parent and foreign subsidiary, thereby reducing the costs and risks of FDI. But again, the indirect, less obvious effects may be the most important. For example, falling transport and communications costs have served to export U.S. culture and U.S. brand names around the world. In some important aspects of consumption, the rest of the world is becoming more like the United States. In principle, that development should lead to enhanced opportunities for foreign direct investment by U.S. firms, according to the first criterion above.

One should be careful, however, about generalizing on the basis of a particular set of historical circumstances. American firms' periods of most rapid foreign expansion occurred when those firms possessed a unique set of skills for managing large manufacturing operations. Some of those skills may no longer be valuable, and the valuable skills have likely diffused across most established firms in industrialized countries today. In short, American firms may no longer possess an unusually valuable set of management skills to be applied worldwide. If that is true, then the continuing innovations in communications may not herald important changes in FDI. Rather they may allow independent organizations to more easily coordinate

the flow of time-sensitive (often branded) products between countries. That is, the major effect may be on trade.

Policy Issues

What public policy issues are likely to come to the fore in the future? Recall that past changes in technology and policy have had two types of effects. One type lowers the costs of transporting goods that are already traded internationally. These effects tend to be small and incremental because transport costs are now small parts of total costs for most of these goods. But the second type expands markets, turning local and seasonal products into global and regularly available products. We are likely in the midst of a series of market expansion shifts now, as communications technologies improve and as firms learn how to apply the technologies to introduce new products to retail distribution.

Public policy should aim to design an environment within which innovation and investment can take place. Toward that end, two issues are paramount today. First, technological change has undermined the old regulatory framework for telecommunications. Policymakers need to decide how to design a new regulatory framework that will not discourage investment in the system and the development of new applications. Second, policymakers need to take steps to ensure that major terminals and transshipment points do not become overly congested, especially in the light of the extraordinary growth in movement of time-sensitive freight.

CHAPTER 6
Regional and Multilateral Trade Agreements

The United States has participated with other nations in the eight rounds of multilateral trade negotiations since the inception of the General Agreement on Tariffs and Trade (GATT) in 1948. The main principles of the original agreement are the first part of this chapter. This section reviews Uruguay Round accomplishments related to trade and foreign direct investment in processed foods. While Vaughan et al. (1994) found in their interviews that government policies were not the major factor in most of the firms' decisions on the method of entering a foreign market, international trade rule changes are likely to boost both trade and foreign direct investment in the processed foods industries.

The 117 GATT members completed the latest round of negotiations, the Uruguay Round, in December 1993. The signing was in April 1994, the agreement was ratified by the United States and other members of GATT, and it became effective on July 1, 1995. One of the most visible results of the Uruguay Round agreement was the transformation of the General Agreement (treaty) among nations known as contracting parties, into a full-blown international institution, the World Trade Organization (WTO). This chapter deals with the aspects of WTO rules that pertain to processed foods trade. For the sake of consistent terminology, the discussion refers to the WTO to mean either the WTO per se or to the GATT.

In addition to multilateral negotiations, the United States has completed complementary regional trade agreements: U.S.-Canada, U.S.-Israel, and the North American Free Trade Agreement (NAFTA). Of the three, the NAFTA among the United States, Canada, and Mexico is the most significant because the U.S.-Canada agreement is subsumed in it and the U.S.-Israel agreement covers a smaller amount of trade. The NAFTA negotiations began after the start of the Uruguay Round and finished before its conclusion. This shaped NAFTA to the extent that

negotiators did not want provisions that would lead to direct conflict with provisions of the anticipated multilateral agreement.

WTO Principles

The primary principles of the WTO are most-favored nation (MFN) and national treatment, which were Article I and Article III, respectively, of the original agreement. A third principle, transparency, has grown over time and is quite important to processed foods trade, especially for products of limited shelf life. The general statement of MFN requires that "goods of any contracting party be given no less favorable treatment than that given any other contracting party" (Jackson, 1969 p.255). MFN prevents, for example, the United States from giving Germany import preferences over the United Kingdom. The idea is to create a liberal trading environment that avoids creating trade distortions. Regional trade agreements are an exception to MFN, allowing trade preferences within a trade agreement that includes substantially all trade. MFN does allow for preferential treatment of developing countries, the best example being the special access granted by the European Union under the Lomé Convention to a designated list of African, Caribbean, and Pacific nations growing out of former colonial status.

National treatment obliges countries to give the same treatment to imported products that have cleared customs as is given to domestic goods. Taxation and regulation are two obvious areas that could be abused. Jackson's examples are apt: "An internal tax can be a protectionist substitute for a tariff if it discriminates against imported goods. Likewise, internal government regulations can operate to protect domestic goods—e.g., a ban on the internal sale of an imported product is more effective than a tariff in keeping the product out of a market. Subtle devices, such as labeling and packaging requirements, and special "health" or purity regulations applying only to imports can operate in the same manner."

National treatment confers obligations on national governments, which must ensure that State and local governments also do not discriminate against imported goods. Local products may be

favored or disfavored by business practices and consumer preferences, but these are not subject to WTO rules.

Transparency is a general requirement that a country make available to foreign companies and governments the requirements and changes in requirements for access into the country. The transparency requirement attempts to improve predictability and steadiness in import requirements. For processed foods, the importance of transparency is obvious. If a shipment of frozen food with a definite shelf life is met at the border by customs agents who reject the shipment because of new requirements for a license, a different label or a different package, or reinspection of the plant that produced the product, the exporting company may suffer losses due to spoilage or delay. Transparency essentially requires that there be no hidden barriers or changes in import requirements without notice.

The exemptions to the basic obligations under WTO rules are contained in Article XX, which allows countries to use measures to protect public morals or to protect human, animal or plant life or health, etc., so long as the measures are not employed in an arbitrary or discriminatory manner. The Uruguay Round agreement clarifies, as discussed below, that such measures must have a scientific basis and rest on appropriate risk analysis.

Uruguay Round Agreement

Four of the fifteen sections of the Uruguay Round Agreement deal with technical barriers to trade (TBT), trade-related investment measures (TRIM's), trade-related intellectual property issues (TRIP's), and sanitary and phytosanitary standards (SPS). These impact directly on international commerce in processed foods. In combination with a stronger dispute settlement mechanism in the World Trade Organization, the strengthening of rules on TBT, TRIM's, TRIP's, and SPS should yield trade expansion and potentially alter decisions on whether to enter foreign markets through FDI or trade. TBT and SPS are touched on lightly here but are addressed in detail in chapter 7. In addition to the areas above,

the Agreement on Agriculture is important to the processed-foods industries.

Technical Barriers to Trade (TBT)

The Agreement on Technical Barriers to Trade (i.e., Standards Code) was initiated in the Tokyo Round (1973-1979), setting out principles that were strengthened in the Uruguay Round. The main drawback to the Standards Code before the Uruguay Round Agreement was that it had no binding enforcement mechanism. The establishment of the Dispute Settlement Body in the Uruguay Round is intended to remedy this shortcoming. The Uruguay Round also brought process standards under the TBT agreement, whereas the Tokyo Round covered only product standards.

The TBT agreement deals with such areas as packaging and labeling requirements, inspection, and certification procedures in order to protect the public and avoid deceptive practices. It encourages countries to adhere to international standards when such standards already exist, to publish their standards, and to base standards on scientific evidence and appropriate risk assessment.

Trade-Related Investment Measures (TRIM)

The TRIM agreement applies only to investment measures related to trade in goods. There appears to be little that is new in the TRIM Agreement that applies to FDI or trade in processed foods. The TRIM Agreement applies mainly to imports tied to re-exports in terms of value, foreign exchange, or quantity and to laws on local manufacture, local content, or local equity in the firm**.**

Sanitary and Phytosanitary Standards (SPS)

The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) applies to human, animal, and plant health and safety arising from diseases, pests, additives, contaminants, and toxins. As with the TBT agreement, the SPS rules encourage the development and use of harmonized international standards to facilitate trade. The SPS agreement names the Codex Alimentarius

Commission, the International Office of Epizootics, and the International Plant Protection Convention as the international standards agencies. In cases of different standards in two countries, the importing country is required to accept the exporting country's standard if the exporting country demonstrates the equivalence of its own standard. In other words, the importing country accepts the product if the sanitary or phytosanitary protection afforded by its scientifically based standard is met by a different procedure in the exporting country.

National agencies, such as the U.S. Food and Drug Administration (FDA), specify how foods must be treated in processing (e.g., at what temperature and for how long) to ensure that diseases and microbes are not viable in the food product. The question of what rules are adequate without being too restrictive gives rise to differing interpretations of SPS rules for processed foods. The second reason why SPS rules may apply to processed foods is the degree of processing. For instance, fresh packaged seafood is considered processed even if little or nothing has been done to ensure that the seafood is not contaminated.

Trade-Related Intellectual Property Issues (TRIP's)

The main provisions of the TRIP's agreement deal with patent and copyright protection, which apply to branded food products. The agreement builds on existing institutions including the World Intellectual Property Organization (WIPO), a U.N. agency founded in 1967. The agreement establishes minimum standards to which countries must adhere. Alleged violations are subject to the WTO Dispute Settlement Body. The most obvious ways that international commerce in the food sector is facilitated by TRIP's are in brand protection, geographical indications, and protection of proprietary information such as processing technology and recipes.

The TRIP's agreement protects food brands in the same way as for the more publicized cases of software piracy or counterfeit clothing. A company such as Kellogg's, for instance, does not want another company offering Kellogg's Corn Flakes in any country because immediate profits may be lost and because Kellogg's reputation for

quality may be injured if the other company's product is inferior. The TRIP's agreement protects brand names by including seven articles on trademarks, which are renewable indefinitely.

"Geographical indications" (also known as denomination of origin) is a contentious area. The product label must say where the product originates and may not present itself in a misleading manner, e.g., a soy sauce boldly proclaiming Canton Soy Sauce should be from Canton Province in China rather than from Canton, Ohio. Perhaps the best known example of geographic indications is the case of champagne. France insists that only sparkling wine produced in the Champagne region of France can be properly known as champagne. Some other countries counter by saying that champagne is a type of product produced in many places, but known everywhere as champagne. Some countries and firms accept that the name belongs to a specific region of France and that sparkling wine from other places should be designated with "methode champenoise" if it is made by the same process used in France. The principle is established in WTO rules, but its impact will only be clear as precedents are established through case-by-case settlement of disputes.

The requirement to disclose proprietary information is a means used by some countries to acquire technology or formulas that have been developed elsewhere. This distorts firms' decisions on how best to enter a foreign market, i.e., whether to export a product or invest and produce it in the destination country. For example, a beverage company may prefer to manufacture in the destination country because it would not be paying to transport water. A company such as Coca Cola may decide to export if the destination country requires that the formula for Coca Cola be disclosed to the government of the destination country. The TRIP's agreement protects proprietary information by requiring member countries to keep secret any information of commercial value that is submitted to the government in order to gain approval for marketing.

Agreement on Agriculture

The Agreement on Agriculture has been discussed thoroughly elsewhere (Josling 1994, USDA 1994B, and Hathaway and Ingco 1995), but the main outlines and implications for processed foods bear mentioning. The Agreement on Agriculture is important to the processed foods industries because it applies to many processed products that are traded in bulk after a first stage of processing. For instance, grain mill products such as, soybean meal, corn gluten feed, wheat flour, and vegetable oils fit in SIC-20 (Food and Kindred Products) rather than SIC-10 (Agricultural Products).

The main outcomes of the Uruguay Round Agreement on Agriculture were (1) a reduction in export subsidies by 21 percent in volume (tonnage) terms and by 36 percent in terms of expenditures; (2) a commitment to improve import access by reducing existing tariffs, maintain current access opportunities, and expand import opportunities where access was low or non-existent; and (3) a reduction of 20 percent in the Aggregate Measure of Support (AMS), the trade-distorting agricultural support programs overall, not commodity by commodity. The disciplines imposed by the agriculture agreement reduce governments' scope for distorting trade in food and agricultural products. In addition to liberalizing trade, the agreement creates an incentive for countries desiring protection to use other means including product and process standards.

Dispute Settlement

The Dispute Settlement Body (DSB) was created in the Uruguay Round to provide a stronger means of settling disputes than had existed before. Until the implementation of the Uruguay Round agreement, the defending party could deny the GATT jurisdiction, avoid timely settlement, and block adoption of dispute settlement rulings.

Now, a member is required to enter consultations within 30 days when another member brings a complaint to the WTO. If there is no resolution 60 days after the complaint is registered, the member bringing the complaint can ask for a panel to consider the complaint. If the parties to the dispute cannot agree to membership of the panel,

the Director-General appoints a panel. A timetable is laid out, including an appeals process if necessary, that leads to resolution within 14 months of the original complaint. If a member succeeds in the dispute and the losing party refuses to implement the decision, the winner is entitled to compensation or to withdraw concessions.

Adequate enforcement changes the behavior of firms and institutions. In the case of NAFTA, Mexico wanted to improve access to the U.S. market for its avocados. USDA's Animal and Plant Health Inspection Service (APHIS) was reluctant to comply based on its traditional scientific procedures, which aim to prevent importation of harmful organisms. In the case of Mexican avocados, APHIS was not convinced that there was no threat from insects. APHIS is reconsidering its position with prompting from U.S. apple industry representatives, who contend that reciprocal treatment from Mexico following such a precedent could diminish U.S. apples' access to Mexico.

The dispute settlement mechanism may be the key to realizing the potential trade expansion in all the other areas of the Uruguay Round agreement. If the Dispute Settlement Body operates in a way that ensures countries can get claims addressed in a timely, impartial, predictable fashion, then countries will have to live up to their obligations agreed to in the other areas of the agreement.

A well-functioning dispute settlement system serves to make WTO agreements into enforceable contracts. Countries will be more likely to bring disputes if they think they can win on the merits of the case, as opposed to the former situation in which countries could (and did) block the formation of a dispute panel or refuse to accept the outcome. Countries may also be more likely to comply with agreements because they know that other WTO members have more certain means to have rules enforced. The resultant positive effect on trade is derived from a decrease in risk to trading companies. Part of the decreased risk derives from more predictable treatment of disputes under WTO rules.

North American Free Trade Agreement

NAFTA, the largest regional trade agreement to which the United States is a party, became effective on January 1, 1994. NAFTA is subject to WTO rules, which allow for regional trade agreements that cover substantially all trade within the region. For food and agricultural products, trade barriers among the United States, Canada, and Mexico are to be reduced and eliminated on a fixed schedule according to the type of product. Some products were deemed "sensitive" by each country, and those products were placed on a slower transition schedule. An example among processed foods is processed tomato products.

A critical provision of NAFTA for processed foods was strict rules of origin, which prevent transshipment of non-NAFTA products through one NAFTA country to another NAFTA country. For a food product to qualify for trade preference under NAFTA, a product has to be produced or substantially transformed within a NAFTA country. In other words, a product could not be imported from outside NAFTA at international prices, repackaged to show a NAFTA origin, and exported to another NAFTA country.

Some opponents to NAFTA argued that products from Mexico should not be allowed improved access to the U.S. market because Mexico has less stringent environmental controls or enforcement and lower wages. This could give Mexican products a cost-of-production advantage because Mexican companies do not have to bear the additional costs of compliance with U.S. environmental and wage regulations. The argument runs afoul of the WTO national treatment obligation, which requires that imported products be given like treatment to domestic products. Objection to Mexican (or other countries') products on grounds of environmental or labor standards falls in the category of process standards (also known as process and production method standards), which are covered in chapter 7.

Ratification and Implementation of Trade Agreements

The process of operationalizing a trade agreement does not end with the final international negotiations. In the United States, a completed trade agreement requires implementing legislation, which amends existing law to conform with the agreement. Recent trade agreements have been negotiated under "fast track" authority, which is approval from the Congress for the Administration to negotiate an agreement that, once signed by all parties to the negotiation, will be approved or disapproved by the Congress without amendment.

In the cases of NAFTA and the Uruguay Round Agreement, the implementing legislation, although not amending terms of the agreements, carried provisions not directly related to the agreements. NAFTA had side agreements on labor and the environment. The environmental aspects are discussed in chapter 8, and the labor aspects bear some discussion here.

The necessity of a side agreement for labor stems from the fear that greater integration of markets will lead to migration of manufacturing capacity from regions with relatively high labor costs to regions with relatively low labor costs, resulting in loss of employment and downward pressure on wages and benefits in the high-cost region. In the processed foods industries, the effect differs according to the product type, but is generally unimportant. Two factors in the food industries tend to dampen effects that might be felt. First, much food processing occurs close to where the farm commodity is produced, and land is not a mobile factor of production. Second, many food products are perishable, with final processing located close to the point of consumption, and large population centers are not mobile.

Summary of Policy Implications

The Uruguay Round Agreement constitutes a major strengthening of international trade rules and liberalization of trade in goods and services. For processed foods, the main areas of the agreement are technical barriers to trade, sanitary and phytosanitary barriers, investment barriers, intellectual property protection, dispute settlement, and to some extent the agriculture agreement. As

detailed above, some of these provisions facilitate trade, and others facilitate foreign direct investment.

For trade in processed foods, the Standards Code and the SPS are stronger since the completion of the URA than they were before. As long as the Dispute Settlement Body puts real teeth into agreements in the WTO, countries should be more aggressive in challenging arbitrary and discriminatory technical barriers. Unresolved issues include the precise application of science-based technical standards and the appropriate risk assessment, the practical meaning of which will emerge as disputes arise and are settled. Further refinements of trade rules affecting trade and FDI in processed foods may be needed in the areas of competition policy and international investment.

For FDI in the processed foods industries, the Agreement on Trade-Related Investment Measures should help to liberalize investment. But in the most industrialized countries, where the bulk of FDI occurs, money already travels more readily than goods.

In the URA, the accomplishments in the trade area appear more substantial than for FDI. While FDI is the preferred strategy of processed food firms entering foreign markets, one would expect any relative shift caused by the implementation of the URA to be in the direction of trade.

CHAPTER 7
Food Industry Standards and Regulations

Globalization of processed foods markets has come about through consumer preferences, technical change, and other factors detailed throughout this report. Companies have responded to consumer demands, and there has been a scramble for standards bodies to catch up with commerce and impose some rules on the marketplace, as seen in chapter 6 on trade agreements. This chapter gives only tangential mention to environmental standards, which are dealt with in chapter 8.

Demand for strict food standards in the United States is intensifying. The GATT Uruguay Round Agreement reduces trade protections and tightens rules for technical standards and investment barriers. The diminution of other forms of protection will raise the profile of product and process standards for both the free trade advocates and for those who demand protection. WTO members have stronger prospects for resolving disputes arising over product and process standards with ratification of the WTO than they did in the GATT arena prior to implementation of the Uruguay Round Agreement.

The motivations for standards are not always transparent or legitimate. To provide a brief illustration before proceeding to a more thorough discussion, the Mexican government in November 1994 began to update its food safety standards. Among them was a requirement that fluid milk could not be offered for sale more than 48 hours after pasteurization. U.S. milk bottlers in California, Arizona, New Mexico, and Texas, who were already selling fluid milk in Mexico, considered the short shelf life regulations as protectionist because they knew that continuously cooled milk has at least a 10-day shelf life (Journal of Commerce, 1995). Devaluation of the Mexican peso diminished the U.S. milk shippers' commercial opportunity in the short run. But, they objected under North American Free Trade Agreement (NAFTA)

rules similar to WTO rules that require that regulations have a scientific basis that is no more stringent than required to meet legitimate objectives.

The following section describes the various aspects of product and process standards, including product definitions, environmental standards, labor standards, and labeling. It covers the motivation for standards, i.e., to ensure safe, wholesome food; to protect the competitiveness of domestic industry (production, processing, manufacturing); and to protect domestic labor and the environment by removing a foreign competitor's cost advantage gained through lower standards. Three public policy questions become evident and are raised as areas for fruitful public policy research: (1) How prevalent is the use of technical food standards and regulations as trade barriers? (2) How can the tension between harmonization of standards and mutual recognition of standards be balanced? (3) How important are public policies in the private decisions of companies choosing to enter a foreign market?

Product and Process Standards and Regulations

In a general sense, product and process standards fall within the broad category of competition policy, other examples of which include tied trade and marketing restrictions. The World Trade Organization (WTO), recognizes technical regulations, which are mandatory measures enforceable by law, and technical standards, which are voluntary measures. Governments and nongovernmental organizations such as industry associations can be involved in the development of standards, depending on the institutional relationships in a particular country. Both technical standards and regulations specify that a product must have certain characteristics or that certain processes must be followed in the manufacture of a product in order to qualify for import and sale. A product or process may be covered by standards in labeling laws, packaging laws, standards of identity, certification and inspection rules, and food safety standards.

The WTO defines technical regulations as: "[a] document which lays down product characteristics or their related processes and

production methods, including the applicable administrative provisions, with which compliance is mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method" (General Agreement on Tarriffs and Trade, 1994).

The WTO definition of a standard is “[a] document approved by a recognized body, that provides for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory” (GATT, 1994).

A typical example of product standards is a product definition. That is, products are required to be what they claim to be. For example, peanut butter has to be made from peanuts. Other examples include the Italian pasta purity laws and the Germany beer purity law, which strictly regulated the permissible ingredients in these products. In former times in Germany, beer could have only prescribed ingredients, and any other ingredients such as preservatives would make it illegal to import and sell such a product. The beer purity law is now mostly voided as far as trade is concerned, but it stood as a product standard for more than 450 years.

Examples of process standards include a ban on goods made with prison labor or a law against the importation of dairy products made of milk produced from cows treated with recombinant bovine somatotropin (rbST). At the time of writing, U.S. dairy products are not banned from any foreign market on the basis of the use of rbST in the United States. If a ban existed, this would be an example of a process standard. Some environmental standards are process standards. That is, there is no objection to the environmental effect of the product itself. The objection is to the exporter’s competitive advantage that the lower environmental standards create.

Effects of Standards and Regulations on Processed Food Firms

In the broadest terms, firms begin with the objective to maximize profits. If a firm decides to enter a foreign market, one might imagine that the decision to trade or invest—whether through new production facilities, acquisition of affiliates in the target market, licensing, or joint venture—is the result of a calculation of the relative costs of product placement in the foreign market. The cost of product placement is a more robust concept than transportation cost because the former is a more encompassing term than transportation costs, transactions costs, or even delivery costs. It involves many other costs including the costs of compliance with technical regulations on products and processes in the target market.

There are many considerations arising from product and process standards that affect a firm's decision to export or invest in foreign production. For instance, a firm can use any slack domestic production capacity to serve a foreign market. Often a firm has more and better information about production and marketing in its home market than in a foreign market. In a foreign market there may be a question of transparency, e.g., product and process standards may not be readily available or may change frequently or without notice. Some firms are quite protective of proprietary technology and formulations that a foreign government may require to be disclosed for safety reasons in order to be certified as eligible for import. A country may specify a minimum share of local content, which encourages domestic processing and the use of domestic materials in production.

Difficulty in meeting product and process standards for imports can lead a firm to buy manufacturing facilities in the foreign market it wishes to enter rather than attempt to export into that market. In a 1994 survey of multinational firms' decisions on export versus foreign direct investment (Vaughan, et al., 1994), economies of scale and delivery costs relative to the value of the product were cited most frequently as decisive factors, but respondents also

mentioned the following considerations that are included under product and process standards: inspection, certification, and risk.

Effects of Standards and Regulations on Farmers

Even though most of the burden of compliance costs falls on food manufacturers, farmers in some cases are affected. The production agriculture sector can be affected by product and process standards in at least two ways. First, the utilization of domestic agricultural products in processed foods is an important component of the demand for these products.

Second, farmers are concerned with the compliance costs of process standards because they increase production costs—for example, a ban on growth-promoting hormones in beef production. However, the existence of high standards may result in greater consumption of U.S. food products if the standards help to create a perception of higher quality in the final products. The latter effect may or may not fully offset the higher costs of complying with standards.

Effects of Standards and Regulations on Consumers

Obviously prices, quality, and safety of food are all very important to consumers. As a recent example of consumers' interest in food regulations, the Nutrition Labeling and Education Act of 1990 (NLEA) became effective on May 8, 1993, for regulation of health claims and on May 8, 1994, for regulation of nutrition labeling and nutrient content claims. The strict rules imposed by the NLEA may impose a substantial burden on foreign firms selling into the U.S. market that they may not have to meet in any other market. Aside from nutrition labeling, consumers want adequate standards to ensure food safety and quality, and, for a given quality, they want to pay as little as possible. Consumer interests in food safety and food prices are not always congruent.

Rationale for Product and Process Standards

There are many motivations for the imposition of standards, leading to considerable ambiguity. The first motivation in this discussion can be thought of as overall national interests, including sovereignty, welfare, and distribution. Sovereignty arose as a concern during the Congressional debates on the GATT Uruguay Round and North American Free Trade Agreement. Some groups believed that U.S. laws, including standards for foods, should be outside the influence of pressure from other nations. Distributional issues include the effect of a new technology on farm structure. Welfare concerns include consumer protection and information issues such as labeling and food safety. Within the food safety category, sanitary and phytosanitary standards (SPS) dealing with processed foods include pesticide residues and microbial contamination.

A second motivation for product and process standards is food safety concerns arising with new technologies. This raises the question of the degree to which the technologies change the essential character of the product. In the case of recombinant bovine somatotropin (rbST), studies by the U.S. Food and Drug Administration (FDA) have found that the milk from untreated cows is identical to milk from cows treated with rbST. As a result, FDA has sharply restricted the wording that dairy foods marketers can use in labeling the product with respect to the use of rbST. The label cannot claim or imply safety or nutritional advantages for the non-rbST product. In the case of hormone implants in U.S. beef animals, a longstanding trade dispute has existed between the United States and the European Union, which bans the use of hormone implants that have withstood rigorous tests of safety, quality, and efficacy in the United States. In this instance, the EU does not claim that the meat is unsafe for human consumption, but objects to the process by which the beef was produced. Food irradiation presents another example of a technology that has generated some controversy based mainly on process. If a product with exactly the same food safety characteristics as an irradiated food could be produced without being irradiated, there would be no objection to the product.

A third motivation for standards is to facilitate desirable commercial developments. For instance, standards of identity, also known as product definitions, are defined by the FDA primarily for food safety purposes. Standards also facilitate trade by product description, reduce transactions costs, and improve market efficiency. Other standards serve commercial concerns including protection of geographical designations and brand names, as discussed in chapter 6.

Fourth and finally, product and process standards can be motivated by trade protectionism. As discussed in chapter 6, the Uruguay Round strengthened rules against the use of product and process standards as instruments of trade protection in the Agreement on Sanitary and Phytosanitary Measures and in the Agreement on Technical Barriers to Trade. In brief, the Uruguay Round outcomes insisted that standards be based on scientific evidence and appropriate risk analysis, that standards be transparent to other members, that standards be harmonized through international institutions where possible, and that members' standards, even if different from each other, be considered equivalent if the exporting country can demonstrate that the importing country's legitimate objectives are achieved by the exporting country's standard.

Out of a desire to protect their citizens, countries may inadvertently create an unjustifiable trade barrier. The Delaney Clause, which mandates zero tolerance for residues of pesticides that contain known carcinogens, is an example of a standard that could be challenged for not being based on appropriate risk assessment or appropriate science. For some known carcinogens, technological precision has advanced to the point that scientists can detect substances at harmless levels, called the "no observable effect level" (NOEL).

Institutions

Product and process standards are not all governed by a single global body of rules. There are GATT rules, GATT precedents (case law), the Codex Alimentarius Commission, industry standards, and national institutions and laws whose jurisdictions

overlap and contradict each other. The common functions of standards institutions are establishment of the standards, harmonization of standards across national and other administrative jurisdictions, enforcement of standards, and arbitration of disputes when members disagree on the application of standards. Of all the institutions performing these functions, the WTO has the greatest scope.

The WTO, as was also true for GATT before it, does not permit the use of technical standards as trade barriers. But Article XX of the GATT allows for general exceptions to the principles of most-favored nation and national treatment:

> "No country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal or plant life or health, of the environment, or for the prevention of deceptive practices,
> at the levels it considers appropriate, subject to the requirement that they are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail or a disguised restriction on international trade, and are otherwise in accordance with the provisions of this Agreement." (GATT, 1994).

Members' obligations following the Uruguay Round are fairly extensive, although there are in many cases no fixed measures for compliance. Members are encouraged to:

• use existing international standards unless there are unusual circumstances;

• participate in formulating new standards where none currently exist;

• publish intent to create standards (where no international standard exists) so other countries have an opportunity to consult and suggest amendments before the standard is applied;

• give higher priority to performance of standards in producing acceptable products than to design or description;

• accept other countries' standards that differ from their own as long as the objectives of their own standards are met;

• give notification of the objective and rationale of new technical standards and allow consultation; and

• give assistance to other members (particularly developing country members) that want to establish technical standards.

In addition, the Technical Barriers to Trade (TBT) agreement in GATT contains a code of good practices for so-called conformity assessment procedures, which include the following:

> "Any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled. Conformity assessment procedures include, inter alia, procedures for sampling, testing and inspection; evaluation, verification and assurance of conformity; registration, accreditation and approval as well as their combinations." (GATT, 1994).

Development and Harmonization of Standards

Codex Alimentarius and Other International Organizations

The SPS agreement specifically names three international institutions that have jurisdiction for establishing international standards. National governments provide official representation in these organizations. The Codex Alimentarius Commission, headquartered in Rome, is the main body establishing sanitary and phytosanitary standards. It began in 1962 with joint sponsorship of the U.N. Food and Agriculture Organization (FAO) and the U.N. World Health Organization (WHO) to establish food safety standards. Other smaller institutions include the International

Office of Epizootics, established in 1924 to handle animal disease standards, and the International Plant Protection Convention, established in 1953 for plant health standards.

The International Standards Organization (ISO) and Comité Européen de Normalization (CEN) are standards bodies operating on a regional or nongovernmental basis that can provide a competitive advantage to companies within the region where the standard is being developed. This is not to say that countries and companies outside of the organizations are being denied a voice in setting standards. The WTO rules call for members who are setting standards to provide opportunities for other countries to be consulted and to be given adequate time to comment before new standards are adopted, and to comply when new standards come into effect.

There remains a potential for trade diversion whether intended or not. For regional standards bodies such as CEN, the argument against regional harmonization as opposed to multilateral harmonization (i.e., through the WTO) is similar to the argument against regional trade liberalization agreements. A regional grouping (e.g., NAFTA, EU, or ASEAN) provides for common standards or mutual recognition within the trading group that may be preferential for members within the group, which means that an advantage is conferred to members and a disadvantage to nonmembers. Any impairment of access for products coming from outside the regional grouping may or may not be intentional, but standards may be set by compromises among the regional group's membership that do not consider the interests of nonmembers. The result may be a standard that requires greater costs of compliance for nonmembers than for members, thereby affecting trade patterns. In principle there is no problem with WTO rules as long as the trade agreement meets certain criteria (primarily, this means that the agreement covers substantially all trade), and that the standards are not set or applied in a discriminatory or arbitrary way. After all, the prime objective of regional trade agreements is to stimulate economic growth by facilitating trade within the region.

ISO 9000: A Voluntary System of Standards

The International Standards Organization is located in Geneva, Switzerland. ISO 9000 is a method of quality assurance by which companies become certified as following recognized best practices. Certification declares to the buyer that the manufacturer has met a high quality standard. In other words, ISO 9000 standards are voluntarily followed practices, not technical standards required by a government. For industry standards, ISO 9000 is a system of quality assurance that can be used for food products, but is applied as well to products of other industries.

Widespread adoption of ISO 9000 standards could be followed by governmental recognition and adoption as minimum standards within a country or region and legally (or effectively) become an import standard, which would then be nondiscriminatory. It could be challenged as being a higher standard than can scientifically be shown as necessary. Bredahl and Zaibet (1994, p.11) conclude that "the momentum clearly seems to be in the direction of ISO adoption and the emergence over time of certification as a necessary condition to do business in the EU food sector."

Public Policy Issues

The globalization of the processed foods market raises many public policy issues related to product and process standards. The increase in trade and foreign direct investment in processed foods increases public policy interest in standards not only because the commercial base is larger, but also because consumers are more demanding of high-quality, safe products at the least cost. Globalization has increased competition, and the rules are clearer and more enforceable. The completion of the Uruguay Round creates a clearer set of obligations regarding standards and, with the establishment of the Dispute Settlement Body, a stronger procedure for determining whether WTO members' food product standards serve only to support legitimate objectives. The following three public policy topics show the way toward establishing the importance of product and process standards, how and where they are used properly and improperly, and their effect on quantities of

processed foods traded, funds invested internationally in the processed foods industries, and ultimately on food prices.

Technical Standards as Trade Barriers

With clearer rules and a stronger method of dispute resolution, policy needs to be guided by an understanding of the prevalence of food standards acting as a foil for protectionist interests. Accordingly, there is a need to identify countries, products, or firms for which product and process standards may have been used improperly in the past. The process of identifying this problem will reveal where researchers and government officials should focus efforts to achieve the greatest benefit in terms of removing improper product and process standards that impede food trade. By examining the pattern of trade complaints brought to GATT, one should be able to ascertain the importance of product and process standards in trade rule violations and whether their importance is increasing or decreasing in number and as a share of all trade complaints. A further step to assess the use of technical standards as trade barriers would be to pair the records of trade complaints with patterns of FDI and trade in processed foods to determine if there are patterns in countries, products, or firms that would establish the prevalence of problems with standards. Additional information from industry sources could be valuable in identifying commercial concerns about the application of standards that never became formal trade disputes because of the lower likelihood of satisfactory resolution of disputes under the rules in force before the Uruguay Round Agreement.

Harmonization versus Mutual Recognition

Two principles that govern standards in the WTO Technical Barriers to Trade Agreement and the Sanitary and Phytosanitary Standards Agreement are harmonization and equivalence (also known as mutual recognition). These principles are not always congruent. In some cases harmonization, rather than equivalence, is the guiding principle. In others, the reverse is true.

The varied use of the two principles leads to the question of whether it is possible to identify factors—institutional, economic, or political—that lead to the choice of one or the other. For example, Hooker and Caswell (1995) suggest that, for food trade, one should expect mutual recognition for quality standards and harmonization for food safety standards. Perhaps the type of product is an important factor in determining the guiding principle used under WTO. Harmonization may yield the greatest benefit for bulk or intermediate products that do not require significant processing. These products are more likely to be commingled and benefit more from the facilitation of packaging and handling, thereby lowering production or transaction costs. In contrast, harmonization of standards may not realize these benefits for products that have been further processed. Harmonization may impinge on consumer sovereignty by narrowing the spectrum of products offered to the consumer.

Effect of Standards on Trade and FDI

Interviews have suggested that companies looking to enter a foreign market seldom give much consideration to "policies," including product and process standards, in deciding whether to enter that market via exports or FDI (Vaughan et al.). To discover the importance of product and process standards in the trade versus FDI decision, one empirical approach would be to select cases and attempt to compare the relative costs of product placement associated with various approaches to entering a foreign market. Companies are understandably reluctant to divulge proprietary information about current decisions and operations, but perhaps suitable cases could be identified that would yield insight without compromising the firm's ongoing operations. This approach would assess the impact of product and process standards on the costs, including the evaluation of risk, of product placement into a foreign market and thereby their influence on the method of entry into a market.

Summary

Following the Uruguay Round, product and process standards for food products are under the spotlight more than in the past. Standardization has proven commercial advantages, yet mutual recognition acknowledges that a single objective can be attained by different methods in different countries. Protectionist interests find other trade barriers falling, leaving standards as one of the few remaining avenues for protection. The dispute settlement mechanism that was strengthened in the Uruguay Round focuses attention on standards by requiring that they have a scientific basis and rest on appropriate risk assessment. International standards have been boosted, and equivalence has become the rule in the absence of international standards.

CHAPTER 8
Trade and Environmental Linkages for Food and Agriculture

This chapter provides a brief discussion of the issues relating to food and agriculture in the trade and environmental policy field. First, we focus on an overview of the trade, environment, food, and agriculture nexus, and second we discuss results from a specific study on trade and environment linkages in the context of economic integration in the Western Hemisphere.[7] While the results of the study are illustrative only, they do provide a perspective on the trade and environmental effects of expanding regional or global integration. More extensive discussions can be found in Eglin 1995, Esty 1994, Krissoff et al. 1996, Rege 1994, Runge 1994, and Schlagenhof 1995.

Much of the trade and environment policy debate stems from concerns expressed by environmental, consumer, and business organizations. Environmental and consumer groups (Greenpeace, Sierra Club, and Public Citizen, for example) have generally expressed support for a closer scrutiny of the environmental impacts of multilateral and regional trade policies and an international consensus with their recommendations on conservation, sustainable development, and safer and healthier products. These organizations decry the allegedly negative environmental effects of shifts in production and trade due to trade liberalization. Also, some environmental groups worry that international trade agreements will encourage harmonization of environmental policies at lower national standards than those currently in force in industrialized nations. Finally, some environmental and consumer groups favor the use of trade instruments to achieve their environmental policy goals.

[7]For more information, see Gray, Krissoff, and Tsigas, 1995.

Business groups, including some farm and food organizations, also have expressed concern that domestic environmental regulations will impair their international competitiveness. If environmental regulations increase domestic costs of production, they argue, competing exporters should face similar constraints. A related issue of concern to food processors is the lack of standardization for labeling and packaging among countries. Industry groups wonder if different foreign standards are covert trade barriers. Harmonization of labeling and packaging standards, including "ecolabeling," has been raised at international forums as a means of addressing perceived unfair competition.

Multilateral and Regional Trade Accords

Since 1947, when the General Agreement on Tariffs and Trade (GATT) Articles were adopted by contracting countries, several rounds of GATT negotiations have lowered barriers to trade among an increasing number of countries to promote trade, economic growth, and full use of resources (Preamble, GATT 1947). Trade-related environmental matters, however, are not explicitly covered in the GATT Articles, although Article XX is an exception.

Article XX furnishes signatories with 10 exceptions to GATT's guidelines aimed at limiting trade restrictions. Trade measures that fall under Article XX are permitted on the condition that they "are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." Article XX subparagraphs (b) and (g), respectively, relate to measures that are "necessary to protect human, animal, or plant life or health" and measures for "the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." Additionally, the latest round of negotiations, the Uruguay Round, established rules on issues relating to food, health, and safety standards (see chapter 7).

The United States, Canada, and Mexico reached two regional accords with environmental provisions: the North American Free

Trade Agreement and the North American Agreement on Environmental Cooperation (NAAEC). In addition, the United States and Mexico agreed to establish a Border Environmental Cooperation Commission (BECC) and a North American Development Bank (NADBank). Together these agreements contain a wide array of provisions to encourage economic growth and to promote cooperation to improve environmental conditions throughout North America. NAFTA establishes the importance of international environmental agreements; renounces the relaxation of health, safety, and environmental measures for attracting foreign investment; addresses food safety, animal and plant health concerns, and other product-standard issues; and is sensitive to environmental issues in dispute settlement provisions. Contracting parties in NAFTA have also agreed to examine or monitor the environmental impact associated with post-reform changes in crop mix, regional production patterns, land and variable farm input use, and trading patterns. An Economic Research Service/USDA report details changes in primary and processed agricultural product trade after the first year of NAFTA.

In December 1994 the democratically elected leaders of the Western Hemisphere countries met in Miami to discuss further economic integration in the Western Hemisphere. Among their objectives were reduction in trade and investment barriers, economic growth, and improvement of environmental quality. While the prospects of negotiating an expanded Western Hemisphere integration are not clear, the potential for further economic integration has spurred the development of domestic institutions that regulate and enforce environmental laws in Latin America. These include:

• Mexico established new norms, especially with respect to emissions of dangerous waste materials, to be brought in line with other OECD countries (*International Environmental Reporter*, 1995).

• In 1990, Chile established the National Commission on the Environment, and in 1994 the Basic Law on the Environment gave

the Commission authority to establish and coordinate national environmental standards.

• In Brazil, the ministries of the Environment and Agriculture are preparing guidelines for environmental regulations for farmers. The regulations will mainly focus on the prevention of soil erosion (*International Environmental Reporter*, 1995).

The Food Sector

The Uruguay Round Negotiations, the North American Free Trade Agreement (NAFTA), and extensions to NAFTA now under consideration will lead to a much freer trade regime for food commodities. Many in the food sector support multilateral and regional trade reform because they see increased business opportunities through improved market access to large populations with a potential for growth in per capita incomes. At the same time, freer trade in food commodities will give increased significance to the effects of environmental regulations. They affect production costs and thus may make it difficult for domestic producers to compete with foreign producers who may not face the same environmental policies. Several of these environmental problems are associated with the production, consumption, and disposal of food: loss of top soil, water pollution due to excessive use of chemicals, emissions from livestock operations that damage drinking water and pollute the air, the loss of wildlife and endangered species from extensification of farming and expansion of fishing, atomic radiation of food, packaging regulations for beverages (e.g., bottles versus cans), and disposal of packaging materials.

Several areas of potential conflict between trade and environmental interests may influence the food sector. Most relate to divergent national environmental standards. Some laws do impose the same environmental standards on imports as on domestic products. In some cases, the standards are allowed by the provisions of GATT Article XX or under the sanitary and phytosanitary measures. The legality of other standards, however, has been called into question

and has created conflict among trading partners. U.S. restrictions on harvesting tuna are a prominent example of differences in national standards affecting the U.S. food sector. The U.S. Marine Mammal Protection Act sets dolphin protection standards for the domestic fishing fleet and for imports from international fishing boats that harvest yellowfin tuna in the eastern tropical Pacific Ocean. This has created strife between the United States and countries that export tuna to the United States.

Product packaging and labeling requirements and guidelines for applying such domestic requirements to imported products were not discussed in the Uruguay Round, but these issues have been on the agenda of recent meetings of the WTO's Committee on Trade and Environment. Packaging regulations pertain to the materials used or the handling of the materials used in shipping. These regulations might, for example, require packaging to be recyclable or, if not, to be returned to the country of origin. Labeling requirements might mandate the provision of certain nutritional or other consumer information such as the environmental implications of a product's life cycle. "Dolphin safe" labels on tuna cans are an example of environmental labeling. Other product-related requirements might pertain to the procedures that must be followed for registering a new product, including numbers, types, and results of product tests that must be conducted before a product can be introduced to the market. Both the nature of those requirements and the processes that must be followed differ by country.

Conflicts related to trade and environment are not restricted only to conflicts between developed and developing countries. They also arise in trade between industrialized countries. The European Union (EU) is now considering eco-labeling schemes, in an effort to harmonize environmental regulations across its 15 member states. One of these eco-labels will be awarded to cotton products that meet certain chemical residue criteria. In addition to its effect on EU producers, this policy will have important implications for producers in the United States. In anticipation of similar developments in the future, the Final Act of the Uruguay Round Negotiations established the Committee on Trade and Environment to study the linkages between trade and environmental policies.

Trade and Environmental Policy Reform in the Western Hemisphere

We used a simulation model to analyze the impacts of trade and environmental policy reform in the Western Hemisphere, and its implications for food and agriculture. Table 32, part A shows estimates of pollution emissions (toxic substance release) by the food and manufacturing sectors in the Western Hemisphere.[8] About 80 percent of all pollution emissions are generated by chemical manufacturing and the resource-based industries. Among the food-processing industries, the "other food products" category contributes more pollution than all the other food-processing industries (meat products, milk products, and beverages/tobacco) combined. In the north, food processing accounts for about 1.7 percent of all pollution, and in the south, about 2 to 3 percent of all pollution. Table 32, part B shows regional and sectoral abatement expenditures for the food and other manufacturing sectors in the Western Hemisphere.[9] As with pollution emissions, the chemical manufacturing and resource-based industries account for most of abatement expenditures in the United States and Canada. However, the food-processing industries are estimated to account for a larger share of abatement expenditures than pollution. In the United States, for example, food processing contributes about 1.7 percent of total pollution, but its abatement expenditures account for about 7.7 percent of the total.

In the policy reform scenarios under consideration, the three NAFTA countries (Canada, the United States, and Mexico) form an extended free trade agreement with the MERCOSUR countries of

[8]U.S. toxic substance releases are based on EPA estimates and, for other countries, we assumed pollution intensities similar to those in the United States.

[9]U.S. abatement expenditures are based on EPA estimates and, for Canada and other developed countries, we assumed that there are environmental regulations similar to those in the United States. Although citizens in developing countries value environmental quality, we specified that there are no environmental regulations, due to market or government failures.

Argentina and Brazil.[10] Although this supposition abstracts from discussions with Chile to join NAFTA, it does reflect the inclusion of the five largest countries in the Western Hemisphere. The scenarios simulate:

I. elimination of import barriers for trade between the United States, Canada, Mexico, Argentina, and Brazil, and

II. elimination of import barriers, as in (I), coupled with

[10]The MERCOSUR (Southern Cone Common Market) trade agreement was established in 1991 and, upon completion, will completely integrate the economies of Argentina, Brazil, Paraguay, and Uruguay.

Table 32—Sectoral pollution emissions and abatement expenditures in the Western Hemisphere

	CAN	USA	MEX	ARG	BRZ
A. Pollution emissions					
		Pounds of toxic substance releases			
Resource Based Industries	1517370.	11554900.	499190.	588704.	927089.
Meat Products	7329.	45499.	9889.	6264.	8630.
Milk Products	18575.	107674.	4611.	12217.	14210.
Beverages/Tobacco	5234.	46152.	4923.	7889.	5274.
Other Food Product	35863.	333233.	44288.	38222.	48281.
Clothing	181725.	1371640.	161470.	246289.	336754.
Chemicals	1240670.	10673300.	818583.	995859.	1678970.
Final manufacturing	419403.	3902930.	134574.	125112.	289145.
Total	3426170.	28035300.	1677530.	2020550.	3308350.
B. Abatement expenditures					
			Million dollars		
Resource Based Industries	518.156	4689.100	0.315	0.566	0.445
Meat Products	30.119	222.199	0.075	0.072	0.049
Milk Products	21.223	146.199	0.009	0.039	0.022
Beverages/Tobacco	25.317	265.299	0.044	0.107	0.035
Other Food Products	64.461	711.799	0.147	0.193	0.122
Clothing	34.527	309.700	0.056	0.131	0.089
Chemicals	787.449	8050.500	0.961	1.780	1.498
Final Manufacturing	277.747	3071.600	0.164	0.233	0.269
Total	1759.000	17466.4	1.775	3.124	2.533

Continued—

harmonization of environmental policies. In particular, two harmonization schemes are considered:

II.A. *absolute* harmonization according to which Argentina, Brazil, and Mexico impose environmental regulations that duplicate U.S. environmental regulation, and
II.B. *relative* harmonization according to which Argentina, Brazil, and Mexico impose environmental regulations similar to U.S. standards but adjusted for their own stage of development. Table 32, part D shows the pollution tax rates applied in Mexico, Argentina, and Brazil in this scenario.

The critical factors in determining the impact of regional trade integration are the magnitude of import barriers and trade shares. Table 33 shows import barriers that reflect the level of tariff and

Table 32—Sectoral pollution emissions and abatement expenditures in the Western Hemisphere—cont.

	CAN	USA	MEX	ARG	BRZ
C. Benchmark environmental tax rates					
			Percent		
Resource Based Industries	0.3927	0.4667	0.0007	0.0011	0.0006
Meat products	0.2342	0.2784	0.00004	0.0007	0.0003
Milk Products	0.2571	0.3055	0.0005	0.0007	0.0004
Beverages/Tobacco	0.2806	0.3334	0.0005	0.0008	0.0004
Other Food Products	0.2696	0.3204	0.0005	0.0008	0.0004
Clothing	0.1685	0.2003	0.0003	0.0005	0.0002
Chemicals	1.0352	1.2302	0.0019	0.0029	0.0015
Final Manufacturing	0.2649	0.3148	0.0005	0.0007	0.0004
D.Harmonized environmental tax rates					
			Percent		
Resource Based Industries	0.3927	0.4667	0.0727	0.1106	0.0552
Meat Products	0.2342	0.2784	0.0434	0.0660	0.0329
Milk Products	0.2571	0.3055	0.0476	0.0724	0.0361
Beverages/Tobacco	0.2806	0.3334	0.0519	0.0790	0.0394
Other Food Products	0.2696	0.3204	0.0499	0.0759	0.0379
Clothing	0.1685	0.2003	0.0312	0.0475	0.0237
Chemical	1.0352	1.2302	0.1916	0.2916	0.1456
Final Manufacturing	0.2649	0.3148	0.0490	0.0746	0.0372

non-tariff barriers in effect during the Uruguay Round negotiations. The United States and its partners tend to have greater import protection rates in the food sector than in other sectors. U.S. food sector rates vary from an ad valorem equivalent high of 100 percent in milk products; to 18 percent in meat products; 4 to 15 percent in beverages and tobacco; and 7 percent in other food products. Canadian import protection placed on U.S. milk and meat products is also large, 136 and 22 percent, respectively. Among the other Western Hemisphere trading partners, Brazil has the highest level of tariff equivalent rates on U.S. food products, ranging from 25 to 85 percent, followed by Argentina and Mexico, with protection rates ranging from 3 to 18 percent.

Results from integration scenario (I) indicate that regional trading patterns are promoted with liberalization. Of the food sectors, the United States mainly increases its exports in meat, milk, and other food products, totaling approximately $1.2 billion (table 34). Exports are mainly fresh or frozen bovine, chicken, turkey, and pig

Table 33—United States - trading partners bilateral import barriers

	U.S. protection				Trading partner protection			
Product	CAN	MEX	ARG	BRZ	CAN	MEX	ARG	BRZ
	Percent							
Grains	7	4	4	4	13	20	17	11
Non-grain crops	8	19	7	7	36	1	14	51
Livestock	18	18	15	18	21	2	18	1
Resource-based industries	1	1	3	2	5	9	21	2
Meat products	18	18	18	18	22	5	12	30
Milk products	100	100	100	100	136	10	10	36
Beverages/ tobacco	15	4	6	11	7	18	10	85
Other food product	7	7	7	7	7	3	16	25
Clothing	11	15	12	11	21	17	38	60
Chemicals	6	8	6	16	10	6	21	11
Final manufacturing	3	4	5	4	8	12	26	29
Services	0	0	0	0	0	1	0	0

meats; nonfat dry milk, butter, and cheese (mostly to Mexico); and fruits, vegetables, and oilseed products. U.S. imports increase across all food product categories, particularly beverages (malt beverages), tobacco, and other food products, for a total of approximately $1.3 million (table 35). Thus, there is a small decrease in the balance of U.S. food trade. This is true for all trade as well.

Table 34—Bilateral and global trading patterns: U.S. exports

	Canada	Mexico	Argen-tina	Brazil	Western Hemi-sphere	All regions
			Million dollars			
A. Base Level - Value of U.S. Exports						
Grains	102	781	5	155	1043	10982
Non-grain crops	1281	774	31	66	2153	11066
Livestock	215	361	5	25	606	2527
Resource-based industries	750	3606	127	728	11712	42005
Meat products	532	629	2	3	1165	4431
Milk products	24	143	2	4	172	411
Beverages/tobacco	131	98	40	5	275	6749
Other food products	1881	975	34	115	3006	11119
Clothing	1918	1559	148	87	3713	13034
Chemicals	14518	6903	662	1330	23414	73193
Final manufacturing	46773	20605	1957	3658	72994	248191
Services	6391	6036	938	1650	15015	135053
All commodities	81018	42470	3952	7827	135267	558759
			Percent change			
B. Scenario I - Change in Value of U.S. Exports						
Grains	37	45	60	43	44	3
Non-grain crops	82	8	52	365	64	11
Livestock	37	14	109	-1	22	3
Resource- based industries	17	27	103	6	21	4
Meat products	70	18	48	176	42	10
Milk products	1481	43	52	203	246	102
Beverages/tobacco	44	110	49	1911	105	1
Other food products	19	9	68	-4	16	3
Clothing	144	101	368	595	145	38
Chemicals	25	20	82	32	26	6
Final manufacturing	26	30	104	137	35	7
Services	2	7	4	-1	4	-2
All commodities	27	27	85	82	32	—

In table 36, the production and trade flow results under the harmonization scenarios (II.A) and (II.B) are very similar to those for the integration scenario (I). Harmonization policies thus appear to have little additional effect on production and trade flows. This happens because the costs of environmental regulation are small relative to total production costs. For the chemical sector, the

Table 35— Bilateral and global trading patterns: U.S. imports

Item	Canada	Mexico	Argen-tina	Brazil	Western Hemi-sphere	All regions
			Million dollars			
A. Base Level - Value of U.S. Imports						
Grains	349	5	11	0	365	495
Non-grain crops	385	1414	52	569	2420	8521
Livestock	1176	385	10	9	1580	2142
Resource-based industries	28330	6769	301	1043	36442	96511
Meat products	679	20	201	58	958	3143
Milk products	17	0	10	0	27	515
Beverages/tobacco	914	290	55	256	1515	5812
Other food products	1589	519	235	671	3015	8914
Clothing	1308	1892	201	1639	5040	56728
Chemicals	15798	3404	269	1597	21069	79391
Final manufacturing	46977	19879	130	1999	68985	286606
Services	12724	6111	158	422	19416	70087
All commodities	110246	40689	1632	8265	160832	618866
			Percent			
B. Scenario I - Change in Value of U.S. Imports						
Grains	19	-2	0	7	18	11
Non-grain crops	28	73	13	23	53	10
Livestock	64	53	35	67	61	37
Resource-based industries	1	-3	5	11	1	2
Meat products	72	63	62	76	70	11
Milk products	1369	1287	1286	1404	1338	46
Beverages/tobacco	100	4	15	76	74	12
Other food products	29	24	19	3	28	7
Clothing	106	133	93	113	118	7
Chemicals	21	35	19	94	29	6
Final manufacturing	22	25	48	42	24	5
Services	-2	-5	-6	1	-3	2
All commodities	17	24	38	59	21	—

environmental abatement operating costs are around 1.25 percent; for food processing they are less than 1 percent.

The environmental implications of trade liberalization are determined by changes in the scale and composition of output. Since output increases with regional liberalization, Western Hemisphere

Table 36—Simulation results for pollution emissions, abatement, and welfare

Scenario/ region	Pollu- tion	Abate- ment	Net pollution	Environ- ment	Other	Total welfare	Welfare[1]
				Percent			
Scenario I: Trade Policy Integration							
Canada	-0.029	1.788	-0.483	0.161	0.228	0.221	1165
USA	0.172	0.266	0.148	-0.049	0.091	0.077	4024
Mexico	0.474	2.308	0.471	-0.157	0.358	0.300	881
Argentina	-0.234	1.424	-0.237	0.079	0.391	0.358	711
Brazil	0.799	0.672	0.800	-0.267	0.508	0.416	1417
OLA	-0.124	-0.015	-0.124	0.041	-0.312	-0.279	-619
ODV	-0.078	-0.117	-0.069	0.023	-0.052	-0.045	-4626
ROW	-0.101	-0.301	-0.101	0.034	-0.091	-0.079	-8173
Scenario IIA: Trade Policy Integration coupled with Absolute Harmonization of Environmental Policies							
Canada	0.004	1.824	-0.451	0.150	0.231	0.223	1173
USA	0.202	0.302	0.176	-0.059	0.092	0.076	4015
Mexico	0.236	65634.	-131.298	43.766	-0.090	0.125	367
Argentina	-0.063	42774.	-85.784	28.595	-0.306	-0.091	-182
Brazil	0.843	85878.	-171.225	57.074	-0.163	0.052	177
OLA	-0.031	-0.378	-0.030	0.010	-0.320	-0.289	-641
ODV	-0.065	-0.102	-0.055	0.018	-0.049	-0.042	-4395
ROW	-0.083	-0.370	-0.082	0.027	-0.090	-0.079	-8148
Scenario IIB: Trade Policy Integration coupled with Relative Harmonization of Environmental Policies							
Canada	-0.024	1.792	-0.478	0.159	0.229	0.222	1169
USA	0.176	0.271	0.152	-0.051	0.091	0.076	4013
Mexico	0.437	10128.	-19.858	6.619	0.289	0.494	1449
Argentina	-0.200	10026.	-20.295	6.765	0.228	0.433	862
Brazil	0.809	10034.	-19.299	6.433	0.431	0.634	2161
OLA	-0.110	-0.246	-0.109	0.036	-0.313	-0.281	-622
ODV	-0.076	-0.115	-0.067	0.022	-0.051	-0.044	-4542
ROW	-0.098	-0.144	-0.098	0.033	-0.091	-0.079	-8183

[1] Change in total welfare in dollar values is measured in million dollars.

partners are more likely to experience increased pollution while non-Western Hemisphere partners, which may have experienced a decline in trade and output, witness less damage. The United States, Mexico, and Brazil endure small increases in pollution while other Latin America, other developed economies, and Rest-of-World regions enjoy a small decrease in pollution (first column in table 36). Argentina realizes a small decrease in pollution as well because the change in the composition of output to less polluting industries outweighs the effect of increased output levels. In all scenarios, the United States and Canada are able to increase their pollution-cleaning activities because more environ- mental tax revenues are collected (second column in table 36).

The economy-wide impacts of policy reform are reported in Table 36 in both percent change and dollar terms (columns 6 and 7, respectively). In scenario (I), all participating countries benefit from regional trade integration. Environmental welfare declines for Mexico and Brazil since pollution is increasing, a result of a liberalized output mix and no change in environmental policies. For the United States, environmental welfare falls because of the change in output mix even though there are increased efforts in pollution cleaning. The change in environmental welfare for the United States, though, is very marginal.

In the harmonization scenarios, Mexico, Argentina, and Brazil experience large increases in abatement activities, as they adopt stricter environmental regulations. In the trade integration and relative harmonization scenario (II.B), environmental and overall welfare increases for the United States, Canada, Mexico, Argentina, and Brazil, with the exception of the U.S. environment. Again, the U.S. environmental welfare change is very marginal. Trade liberalization contributes more of the benefits than the imposition of environmental regulations, although this result is sensitive to model specification. When the Latin American partners implement U.S.-type environmental regulations in scenario (II.A), then overall welfare gains are diminished relative to scenarios (I) and (II.B). U.S.-type environmental regulations lead to substantial gains in welfare from a cleaner environment, but they appear to be too costly for Mexico, Brazil, and Argentina.

Policy Challenges

Trade liberalization in food and agriculture raises concerns regarding differences in environmental regulations among trading partners. With no changes in current national environmental policies, trade liberalization among Western Hemisphere countries is shown to generate net gains as benefits from increased trade in all countries outweigh relatively small increases in environmental degradation in some countries. With harmonization of environmental policies among trading countries at current U.S. standards, pollution abatement activities increase in the region as a whole enough to improve environmental quality relative to the pre-trade liberalization levels without diminishing gains from increased trade. Thus, multinational coordination of environmental regulation further enhances overall gains associated with the removal of restrictive trade policies. However, gains to Latin American countries increase significantly more, at the cost of a relatively small increase in environmental degradation in the United States, if the harmonized policy is somewhat below current U.S. standards.

From a multinational policy perspective, the issue is clear. Analysis yields compelling evidence that international agreement on environmental policy as a part of trade liberalization accords is multilaterally beneficial. But, the unresolved question is, at what level of environmental quality? While overall gains result from stringent requirements, even greater gains to both the region as a whole and to individual countries other than the U.S. result from multinational adoption of standards that are more modest than current U.S. policy. The policy challenge, therefore, is one of enticing other countries to adopt increased environmental regulations that approach U.S. standards while recognizing that respect for national differences may be necessary to reach international accord.

CHAPTER 9
Intellectual Capital in the Global Food Sector

Commercial success in the global market by a nation's firms rests not so much on the country's endowment of natural resources as on the intellectual capabilities of its people. In contrast to generally accepted economic orthodoxy, an examination of the literature on competitive advantage reveals one principle that consistently stands out: the firms that are most successful in gaining global market share, regardless of nationality, industry, or product, are those that have made substantial investment in intellectual capital. In essence, they put significant effort and resources into the process of human learning—into seeking, discovering, and capitalizing on new things.

Intellectual Property

Important sources of global competitive advantage are business strategies, product and process innovation, and supportive public policies, which are all products of the human intellect. In the language of the new international economics, these competitive advantages are called firm-specific assets, or a firm's intellectual property.

In the context of commercial behavior, a firm's intellectual property refers to those special skills and holdings that enable it to differentiate itself from its rivals. It includes things like brand names, product reputation, trademarks, copyrights, patents, consumer loyalty, advertising, technological leadership, data gathering and analytical capability, special relationships with suppliers, and marketing and management expertise. Generally intangible, a firm's intellectual property is often not fully captured in financial accounts. Even so, strong ties between these intangible assets and international commercial success have been well chronicled in numerous theoretical and empirical studies. Covering a wide array of industries, these studies reveal compelling evidence

of the importance of intellectual property to international competitive success.

Dunning's (1977) OLI construct is perhaps the most eclectic theory of international commerce. OLI stands for *ownership*, *location*, and *internalization* advantages that a firm may be able to exploit in international markets.

Ownership advantages refer to unique, firm-specific assets owned by a firm, which the firm is motivated to both protect and use to generate income. Examples include registered trademarks, copyrighted brand names, secret or patented product formulations, market intelligence, and under-utilized merchandising capacity. As evidence of such assets, one would expect firms to hold leading positions in their home markets as a means of demonstrating control over a highly preferred brand or product image or an effective distribution and merchandising capability. Further, one would expect firms with such ownership advantages to be making substantial investments in market research, development, advertising, and promotion.

Locational advantages relate to benefits firms can realize by operating facilities in foreign markets. Advantages include reduced costs associated with avoiding import barriers such as tariffs and quotas, lower transportation costs, and the development of expertise in local competitive practices such as targeted advertising, pricing-to-market, and close coordination with local distributors and retailers.

Internalization refers to advantages that a firm realizes from performing a range of marketing functions itself rather than depending upon independent suppliers or distributors. For example, a food manufacturer might be able to sell to a foreign distributor at a relatively small transaction cost. But, the manufacturer's reputation for product quality could be undermined by imprudent handling or merchandising by the foreign distributor. Thus, the manufacturer has an incentive to operate its own foreign distribution system. That is, it internalizes the transaction in order to protect its product quality and reputation.

OLI advantages are the result of intelligent decision-making rather than an endowment of natural resources. That is, they are the products of a firm's, or a nation's, intellectual capital. For example, the design of innovative products results from research and development; gaining and holding consumer acceptance results from clever advertising and promotion activities; effective local distribution results from marketing and merchandising expertise; product quality results from testing and control regimes**.**

Empirical Evidence

Many empirical studies, a number of which are specific to processed foods, have documented the strongly positive impact of intellectual capital—particularly as embodied in research and development, managerial intensity and expertise, and product differentiation and innovation—on commercial success in global markets.

Using exports as a measure of global market reach, Handy and MacDonald (1989) found positive impacts of expenditures on research and development on exports across 32 U.S. manufacturing industries. Pagoulatos and Sorensen (1975), utilizing cross-sectional data for 88 U.S. manufacturing industries, found exports positively related to product differentiation as well as to R&D. Using similar data for another time period, Marvel (1980) confirmed the positive R&D-export relationship; further, his study found exports positively related to managerial intensity. Lyons (1989), using pooled time series and cross-sectional data for 111 UK industries, also documented a positive effect of R&D on exports.

Baldwin (1979), using observations across 27 manufacturing industries, also found exports positively associated with managerial intensity. Lipsey (1991), with pooled cross sectional-time series data for 28 U.S. industries, confirmed positive effects of both managerial intensity and R&D on exports. Koo and Martin (1984), observing a sample of 288 U.S. industries, found a positive impact of product innovation on exports. Henderson and Frank (1990), using cross-sectional data on 42 U.S. food-manufacturing

industries, verified a positive effect of R&D on processed food exports.

With sales from affiliated foreign operations (FDI sales) as the indicator of global market success, Yu (1990) reported finding positive impacts of R&D and home-market advertising. Handy and MacDonald, in the above-referenced study, also found positive impacts of R&D and home advertising on FDI sales. Ray (1991), in a study of 32 manufacturing industries in five countries, cites strong evidence that FDI sales are positively influenced by specialized human capital and managerial intensity, and weak evidence of a positive impact of home market share, i.e., firms with dominant home-market positions are more successful in generating sales by foreign affiliates. Baldwin (1979) found product differentiation, managerial intensity, and home-market seller concentration positively associated with FDI sales.

Grubaugh (1987) reported findings from a study of 300 U.S.-based multinational firms that tie FDI directly to relative levels of firm expenditures on both R&D and advertising. Dunning (1981) cites evidence of a positive relationship between the value of a firm's intangible assets and FDI. Specific to processed foods, using U.S. food-manufacturing industry data, Connor (1983) documented positive impacts of advertising, R&D, and home market share on FDI sales. Using pooled cross-section time-series data for 628 food manufacturers with headquarters in 16 countries, Henderson, Vörös, and Hirschberg (1996) found intangible assets, product differentiation, and share of home market all positively associated with FDI sales.

Combining both exports and sales from foreign affiliates, in a study of 24 U.S. industries, Gruber, Mehta and Vernon (1967) found both to be driven jointly by R&D. Overend and Connor (1994) examined factors jointly influencing export and FDI patterns for a cross-sectional sample of 33 U.S. food manufacturing firms that also do business in the UK. Their findings show a positive relationship between a firm's investment in foreign marketing expertise and its combined volume of export shipments and shipments from foreign operations.

While R&D, advertising, managerial intensity, and product innovation are all indicators of investment in intellectual property, perhaps the clearest form of commercial transaction in intellectual property is international licensing of product brand names. An international product license is a contract by a firm who owns a brand name that is well established in one country (the *licensor*), with a firm in another country (the *licensee*) to manufacture and sell the branded product in the licensee's home country and/or third countries. Here, it is mainly *image* that a firm in one country is selling and a firm in another country is buying.

In addition to exclusive use of the brand name, the licensor may provide the licensee technical production assistance, a quality control regime, and a product formula or recipe; supply some critical ingredient(s) such as a flavoring extract; and render some financial help for advertising and other market development activities. In turn, the licensee has production, marketing, and distribution rights for the licensed product in the specified market(s), and remits to the licensor part of the sales revenues in the form of a fixed fee and/or an *ad valorem* royalty. Internationally licensed foods and beverages include such well-known brands as Kraft, Sunkist, Budweiser, Almond Joy, Spam, Lipton, Toblerone, and Löwenbräu.

In a study of food manufacturing firms involved in global product licensing, Henderson, Sheldon and Thomas (1994) found a strong correlation between a firm's dominance in its home market and its global market reach. Nearly all firms, whether licensor or licensee, have leading positions in their home market for the classes of product licensed; 41 percent held the largest share of their home market, and 73 percent held either the number 1 or number 2 position. Most food industry executives reported that they would not license with a foreign firm unless that firm was already successful in establishing a leading position in its own market.

Further, the evidence shows that firms involved in international product licensing have made substantial investments in developing and promoting their products and brands. One measure is the book value of their licensed brand names. These values are quite large on

average, the value of a licensed brand name exceeded 12 percent of total assets. A study reported by Ourusoff (1992) places the average value of 12 leading internationally licensed food brands at just over $7 billion each.

Human Capital, Creativity, and Competitive Advantage

Clearly, firm-specific advantages arise from the creativity of individuals. This creativity, a key characteristic of intellectual capital, has given rise to new forms of global commerce in processed foods: direct operation of foreign affiliates, joint ventures, strategic alliances, and product and brand licensing. This commerce has expanded by several magnitudes in the past decade.

Not only are firms creating global markets for their products, they are developing global sourcing networks for product formulation and design, ingredients, engineering and plant construction, food-processing equipment, and packaging systems. Specialized ingredient firms such as Pfizer, Genecor, Rhone Poulenc, Quest International, and Haarman and Reimer are forging long-term alliances with food processors to formulate new products and production and distribution techniques. Likewise, firms such as Calgene, Celltech, DeKalb Genetics, Genentech, and Monsanto are forging new relationships with agricultural producers to grow new varieties of crops and animals, often the products of biogenetic engineering, that provide basic feedstock for these innovative products and processes.

The competitive position of countries is also influenced by the creativity of individuals. Porter (1990), identifying factors that explain the competitive advantage of a nation's industries in global commerce, cites the importance of five classes of national assets: human resources, knowledge resources, infrastructure resources, capital resources, and physical resources. Only one, physical resources, "the abundance of the nation's land, water, mineral, or timber deposits, hydroelectric power sources, fishing grounds, and other physical traits" (p. 74), refers to a natural endowment. The others are all products of the human intellect, that is, intellectual

activity and the institutions such intellect creates. Human resources include the quality and skill of a nation's labor force, characteristics that are typically measured in terms of level of education. Knowledge resources refer to a nation's stock of scientific, technical, product, and market knowledge; stocks that reside in universities, public and private research centers, corporate headquarters, government statistical agencies, business and scientific literature, trade associations, and professional societies. Infrastructure resources include such institutional creations as a nation's systems of transportation and communications, mail and parcel delivery, funds transfer, health care, and cultural institutions. Capital resources represent the amount and cost of capital available to finance industrial growth, the stock of which is a product of the savings rate and the structure of the nation's capital markets.

An example illustrates how quickly contemporary technology can be transferred to a firm and country with little or no production history. In this case, a producer of wine and soft drinks in Malta decided to enter the brewing business. The firm had extensive marketing and distribution know-how, but no experience as a brewer. The solution was to develop an alliance with Löwenbräu International. This resulted in a new state-of-the-art brewery incorporating the latest brewing and packaging technology gathered from around the world. The plant received *Food Engineering*'s International Plant-of the-Year award in 1991. Now, this plant not only supplies Malta, but also provides import competition to southern Europe. To emphasize the point, a country with little experience quickly became a world-class producer by sourcing technology and ingredients internationally.

Be it at the firm or national level, the distinguishing characteristic of these antecedents for commercial success in the global marketplace is the application of the human intellect. The success of nations, industries, firms, and individuals increasingly is built on the ability to create intellectual property and protect the rights to its use. This is now gaining recognition in the international commercial community. Evidence can be found in the Uruguay Round Agreement of the GATT. Therein, national policies that protect industries through import tariffs and production subsidies

are being stripped away. But more importantly, substantial new international protections for intellectual property have been created, particularly in the areas of patents, trademarks, copyrights, brand names, and trade secrets.

Policy Implications

Government plays an important role in international commerce. But, when viewed in the context of human capital and intellectual property, it is different than commonly thought. It has little to do with protecting industries from foreign competition, or subsidizing industries to encourage them to expand at the expense of foreign competition. Rather, it has much to do with creating incentives for individuals and private enterprises to invest in learning, in building intellectual capital through education and investment in research and development, and in using public resources to provide the foundation upon which both individuals and industry can build.

The creation and protection of intellectual property rights is a significant task of public policy. The opportunity for pecuniary gain—the possibility of turning knowledge and intellectual effort into income and wealth—is a powerful motivator of both individuals and private enterprises. There are two basic approaches: lower the cost of discovery and innovation, and raise the returns from doing so successfully. Some combination of subsidies and tax concessions for applied education and research will foster the former. The latter requires that those investing in the process will have some protection from imitators in making commercial application of new discoveries. Copyrights, trademarks, patents, and legal protections for trade secrets are among the relevant policy instruments. The multilateral protections newly accorded these devices through the World Trade Organization should be a substantial boost to international commerce in processed foods, particularly for the United States, which is a world leader in creating and promoting new products and brands.

Moreover, public policy is needed to promote education and basic research, which provide the foundation for applied discovery and development that lead directly to commercial applications. It is

difficult, perhaps not possible, for individuals and private enterprise to capture in their income or profit accounts the full benefits of creating and discovering basic knowledge. Therefore, they will be unwilling to bear the full cost. This is the role for public support of education and basic research.

There remain many unknowns. What, for example, is the optimum length of time to grant a protection for intellectual property? It should be long enough to hold out promise of profitable return to research and development, yet short enough not to stymie adaptation and adoption of desirable products and efficient processes. What is the distinction between an innovative product or process that warrants protection as intellectual property, and a knock-off whose primary attribute is imitation?

In addition to the question of how to protect innovations, there is the question of how to target public support for applied research and development. Often there is an urge to "pick winners," that is, to select industries or sectors that are believed to have high growth potential if the right discoveries are forthcoming. This is typically what industrial policy is about: putting public resources into research and education with specific applications in mind. In many regards, U.S. farm policy has had this intent through agricultural experiment stations, extension and land-grant education, and production subsidies.

Fundamentally, this raises the question, where is the line drawn between basic and applied research? Public support for basic education and research is critical to overcoming a market failure that results in too few resources being so used. Erring away from this side starves the nation of the basic knowledge and discoveries needed to prompt true innovation that is the foundation for promoting industrial growth through competitive advantage in global markets. Applied research and development leads directly to the creation of intellectual property and is inherently a matter for private investment. Erring toward this side provides protections that may ultimately be self-defeating, protections that discourage innovation by coddling vested interests.

References

Ackerman, K.Z., M.E. Smith, and N.R. Suarez. 1995. *Agricultural Export Programs: Background for 1995 Farm Legislation*. U.S. Department of Agriculture, Economic Research Service, Agricultural Economic Report Number 716, June.

Baldwin, R.E. 1979. "Determinants of Trade and Foreign Investment: Further Evidence." *Review of Economics and Statistics*, 61:40-48.

BEA. 1995A. *Foreign Direct Investment Abroad*. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis: Preliminary 1993 Results.

BEA. 1995B. *Foreign Direct Investment in the United States: Operations of U.S. Affiliates of Foreign Companies*. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis: Preliminary 1993 Estimates.

Bredahl, M.E., and L. Zaibet. 1994. "Adoption of ISO-9000 Quality Assurance Standards in the European Food Industry." Unpublished manuscript, University of Missouri, Department of Agricultural Economics.

Buckley, P.J., and M. Casson. 1976. *The Future of Multinational Enterprises*. London: Macmillan.

Caves, R.E. 1982. *Multinational Enterprise and Economic Analysis*. Cambridge: Cambridge University Press.

Caves, R.E. 1974. "The Causes of Direct Investment: Foreign Firms' Share in Canadian and UK Manufacturing Industry." *Review of Economics and Statistics*, 56:279-293.

Connor, J.M. 1983. "Foreign Investment in the US Food Marketing System." *American Journal of Agricultural Economics*, 65:395-404.

Cox, D., and R. Harris. 1985. "Trade Liberalization and Industrial Organization: Some Estimates for Canada." *Journal of Political Economy*, 93:114-145.

Dayton, J., and D. Henderson. 1992. *Patterns of World Trade in Processed Foods. Organization and Performance of World Food Systems*: NC-194, OP-32, Columbus, OH, March.

Dunning, J.H. 1981. *International Production and the Multinational Enterprise*. London: Allen and Unwin.

Dunning, J.H. 1977. "Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach." In *The International Allocation of Economic Activity*, B. Ohlin, P.O. Hesselborn, and P.K. Wijkman, eds. London: Macmillan.

Economic Report of the President. 1995. Washington, DC, U.S. Government Printing Office, February.

Eglin, R. 1995. "NAFTA: Year One", U.S. Department of Agriculture, Economic Research Service, NAFTA-3, April: "Trade and Environment in the World Trade Organization," *The World Economy*, 18(6):769-799, November.

Eno Transportation Foundation. 1994. *Transportation in America.* Lansdowne, VA: Eno Transportation Foundation.

Epps, W.B., and J.M. Harris. 1995. *Processed Food Trade Concordance*. U.S. Department of Agriculture, Economic Research Service. Agricultural Handbook No. 707. March.

Esty, D.C. 1994: *Greening of the GATT:Trade, Environment, and the Future,* Institute for International Economics, July.

Ethier, W.J. 1994. "Conceptual Foundations from Trade, Multinational Firms, and Foreign Direct Investment Theory." Ch. 6 in *Competitiveness in International Food Markets*, M.E. Bredahl, P.C. Abbott, and M.R. Reeds, eds. Boulder, CO: Westview Press.

Ethier, W. 1982. "National and International Returns to Scale in the Modern Theory of International Trade." *American Economic Review*, 72:389-405.

Federal Communications Commission. 1995. *Telephone Trends 1994.*

Federal Communications Commission, 1995. *Statistics of Communications Common Carriers*.

Feenstra, R.C. 1989. "Symmetric Pass-Through of Tariffs and Exchange Rates under Imperfect Competition: An Empirical Test." *Journal of International Economics*, 27:25-45.

General Agreement on Tariffs and Trade. 1994. *The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts*. GATT Secretariat: Geneva, Switzerland.

General Agreement on Tariffs and Trade. 1947. *General Agreement on Tariffs and Trade*. GATT Secretariat. Geneva, Switzerland.

Geringer, J.M. 1990. "Trends and Traits of Canadian Joint Ventures." Investment Canada, Working Paper Number 1990-IV, February.

Gray, D., B. Krissoff, and M. Tsigas. 1995. "Western Hemisphere Integration:Trade Policy Reform and Policy Harmonization." Paper presented at a Symposium sponsored by the International Agricultural Trade Research Consortium and the Inter-American Institute for Cooperation in Agriculture, San Jose, Costa Rica, June 7-9.

Grossman, G.M., and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. Cambridge, MA: MIT Press.

Grubaugh, S.C. 1987. "Determinants of Direct Foreign Investment." *Review of Economics and Statistics*, 69:149-152.

Grubel, H.G., and P.J. Lloyd. 1975. *Intra-industry Trade*. London: Macmillan.

Gruber, W., D. Mehta, and R. Vernon. 1967. "The R & D Factor in International Trade and International Investment of United States Industries." *Journal of Political Economy*, 75:20-37.

Handy, C.R., and D.R. Henderson. 1994. "Assessing the Role of Foreign Direct Investment in the Food Manufacturing Industry." Ch. 11 in *Competitiveness in International Food Markets*, M.E. Bredahl, P.C. Abbott, and M.R. Reed, eds. Boulder, CO: Westview Press.

Handy, C.R., and J.M. MacDonald. 1989. "Multinational Structures and Strategies of U.S. Food Firms." *American Journal of Agricultural Economics*, 71:1246-1254.

Harley, C. K. 1980. "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913." *Explorations in Economic History* 17: 218-250.

Harrigan, K.R. 1988. "Strategic Alliances and Partner Asymmetries," in *Cooperative Strategies in International Business*, F. Contractor and P. Lorange, eds. Toronto: Lexington Books, pp. 205-226.

Hathaway, D. E., and M. D. Ingco. 1995. "Agricultural Liberalization and the Uruguay Round." Paper presented at *The Uruguay Round and Developing Economies***.** Washington, DC: World Bank, January 26-27.

Helpman, E., and P. R. Krugman. 1985. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*. Cambridge, MA: MIT Press.

Helpman, E. 1981. "International Trade in the Presence of Product Differentiation, Economies of Scale, and Monopolistic Competition." *Journal of International Economics*, Vol. 11, pp. 305-340.

Henderson, D.R., and S.D. Frank. 1990. “Industrial Organization and Export Competitiveness of US Food Manufacturers.” NC194 research project *Organization and Performance of World Food Systems* report OP4, March.

Henderson, D.R., and C. R. Handy. 1994. “International Dimensions of the Food Marketing System,” in *Food and Agricultural Markets: The Quiet Revolution*, L.P. Schertz and L.M. Daft, eds. Washington, D.C.: National Planning Association.

Henderson, D.R., and I.M. Sheldon. 1992. “International Licensing of Branded Food Products.” *Agribusiness: An International Journal*, Vol 8, No. 5, pp. 399-412.

Henderson, D.R., I.M. Sheldon, and K.N. Thomas. 1994. “International Licensing of Food and Beverages Makes Markets Truly Global.” *FoodReview*, Volume 13, Issue 3, pp. 7-12.

Henderson, D.R., P.R. Vörös, and J.G. Hirschberg. 1996. “Industrial Determinants of International Trade and Foreign Investment by Food and Beverage Manufacturing Firms.” Ch. 12 in Industrial Organization and Trade in the Food Industries, I. Sheldon and P. Abbott, eds. Boulder, CO: WestviewPress.

Hillman, J. S. 1978. *Nontariff Agricultural Trade Barriers*. Lincoln, NE: University of Nebraska Press.

Hirschberg, J., J. Dayton and P. Vörös. 1992. “Firm Level Data: A Compendium of International Data Sources for the Food Processing Industries,” North Central Regional Research Project NC-194, publication OP-34, April.

Hollon, K.C. 1989. “Problems Encountered by Agricultural Marketing Firms in Food and Agricultural Product Exporting: Analysis of Survey Results.” *American Journal of Agricultural Economics*, Vol. 71, No. 5, December.

Hooker, N. H., and J. A. Caswell. 1995. “Impacts of Food Quality and Safety Regulation Under Trade Agreements on Foreign Direct

Investment and Processed Food Trade." Paper presented at the NCR-182 Conference, *Foreign Direct Investment and Processed Food Trade*, Arlington, VA, March 10.

Horstman, I., and J.R. Markusen. 1987. "Licensing Versus Direct Investment: A Model of Internalization by the Multinational Enterprise." *Canadian Journal of Economics*, Vol. 20, pp. 464-81, August.

Houck, J. P. 1986. *Elements of Agricultural Trade Policies*. Prospect Heights, IL: Waveland Press.

International Environmental Reporter. 1995. February 22, and April 19.

Jackson, J. H. 1969. *World Trade and the Law of GATT*. Charlottesville, VA: The Michie Company.

James, R. P. 1992. "Where's the Beef? More and More, It's on Stack Trains Bound for Japan." *Traffic World*, March 16, p. 38.

Josling, T. 1994. "Agriculture and Natural Resources," in *The New GATT: Implications for the United States*, Susan M. Collins and Barry P. Bosworth, editors. Washington, DC: The Brookings Institution, pp. 40-62.

Journal of Commerce. 1995. "US Dairy Industry Fights Proposed Milk Limits." Jan. 26; pp. 1A,1B.

Kikeri, S., J. Nellis, and M. Shirley. 1992. *Privatization: The Lessons of Experience*. Washington, DC: The World Bank.

Koo, A.Y.C., and S. Martin. 1984. "Market Structure and U.S. Trade Flows." *International Journal of Industrial Organization*, 2:173-197.

Kravis, I.B., and R.E. Lipsey. 1992. "Sources of Competitiveness of the United States and of its Multinational Firms." *Review of Economics and Statistics*, Vol. 74, pp. 193-201, May.

Krissoff, B., N. Ballenger, J. Dunmore, and D. Gray, 1996. *Exploring Linkages Among Agriculture, Trade and Environment: Issues for the Next Century*, Agricultural Economic Report No. 7, Natural Resources and Environment Division, Economic Research Service, U.S. Department of Agriculture.

Krugman, P. 1979. "Increasing Returns, Monopolistic Competition, and International Trade." *Journal of International Economics*, 9:469-480.

Langhammer, R. J. 1987. "Effects of Preferential Tariff Reductions among Developing Countries," in Exports of Developing Countries: How Direction Affects Performance, O. Havrylyshyn, editor. Washington, DC: The World Bank, pp. 71-91.

Lipsey, R.E. 1991. "The Competitiveness of the U.S. and of U.S. Firms." Presented at the 11th Ministry of Finance-NBER Joint Conference, *The Competitiveness of US Industries and its Implications on US-Japan Relationships in the Future*. Tokyo.

Lyons, B. 1989. "An Empirical Investigation of U.K. Manufacturing's Trade With the World and the E.E.C. 1968 and 1980." *The Convergence of International and Domestic Markets*, D. Audretsch, L. Sleuwagen, and H. Yamawaki, eds. Amsterdam: Elsevier Science Publishers.

Mabbs-Zeno, C., and B. Krissoff. 1990. "Tropical Beverages in the GATT," Ch. 6 in Agricultural Trade Liberalization: Implications for Developing Countries, Ian Goldin and Odin Knudsen, editors. Paris: OECD.

MacDonald, J. M., and L. C. Cavalluzzo. 1996. "Railroad Deregulation: Pricing Reforms, Shipper Responses, and the Effects on Labor." *Industrial and Labor Relations Review,* forthcoming.

Malanoski, M., C.R. Handy, and D.R. Henderson. 1995. "Time-Dependent Relationships in U.S. Processed Food Trade and Foreign Direct Investment," presented at NCR-182 conference,

"Foreign Direct Investment and Processed Food Trade," Arlington, VA, March 9-10.

Marvel, H.P. 1980. "Foreign Trade and Domestic Competition." *Economic Inquiry*, 18:103-122.

McCalla, A. F., and T. E. Josling. 1985. *Agricultural Policies and World Markets*. New York: Macmillan Publishing Company.

McKinsey and Company. 1993. *Manufacturing Productivity*. Washington, DC: McKinsey Global Institute.

Muller, G. 1995. *Intermodal Freight Transportation*, 3rd ed. Lansdowne, VA: Eno Transportation Foundation.

Neff, L. 1989. "Industrial Economy Tariff Escalation in Tropical Products," in *World Agriculture Situation and Outlook Report*. U.S. Department of Agriculture, Economic Research Service, WAS-57, December.

Ning, Y., and M.R. Reed. 1995. "Locational Determinants of the U.S. Direct Foreign Investment in Food and Kindred Products," *Agribusiness*, Vol. 11, pp. 77-85.

Office of Management and Budget, Executive Office of the President. 1987. *Standard Industrial Classification Manual*.

Organization for Economic Cooperation and Development. 1991. *Industrial Structure Statistics—1988*. Paris.

Organization for Economic Cooperation and Development. 1992. *Regulatory Reform, Privatisation, and Competition Policy.* Paris.

Organization for Economic Cooperation and Development. 1995. *Communications Outlook, 1995*. Paris.

Ourusoff, A. 1992. "What's in a Name? What the World's Top Brands are Worth." *Financial World*, September 1.

Overend, C., and J.M. Connor. 1994. " U.S. Food Manufacturer's Choice of Foreign Sales Mode." Presented at the annual meeting, American Agricultural Economics Association, San Diego, CA, August.

Overend, C., J.M. Connor and V. Salin. 1996. "Foreign Direct Investment and U.S. Exports of Processed Foods: Compliments or Substitutes?" in S. Henneberry ed., *Proceedings* of NCR-1982 Conference on Trade and Investment by U.S. Food Processors, forthcoming.

Pagoulatos, E., and R. Sorensen. 1975. "Domestic Market Structure and International Trade: An Empirical Analysis." *Quarterly Review of Economics and Business*, 16:45-59.

Porter, M.E. 1990. *The Competitive Advantage of Nations.* New York: The Free Press.

Ray, E.J. 1991. "Foreign Takeovers and New Investments in the United States." *Contemporary Policy Issues*, April.

Rege, V. 1994. "GATT Law and Environment-Related Issues Affecting the Trade of Developing Countries," *Journal of World Trade*, 28(3):95-169, June.

Roberts, D. 1995. *Intra-Industry Trade in Agricultural Products in the Western Hemisphere: Preliminary Evidence and Implications for Economic Integration.* International Agricultural Trade Research Consortium Working Paper #95-1, St. Paul, MN, February.

Roberts, D. 1994. "Argentina," in *Global Review of Agricultural Policies: Western Hemisphere*, Donna Roberts and David Skully, editors. U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin Number 892, September.

Runge, C.F. 1994. "The Environmental Effects of Trade in the Agricultural Sector," in *The Environmental Effects of Trade,* Organization of Economic Cooperation and Development, Paris, 1994.

Schlagenhof, M. 1995. “Trade Measures Based on Environmental Processes and Production Methods,” *Journal of World Trade*, 26(6):123-155, December.

Smith, A., and A.J. Venables. 1988. “Completing the Internal Market in the European Community.” *European Economic Review*, 32:1502-1525.

Södersten, B., and G. Reed. 1994. *International Economics*, 3rd edition. New York: St. Martin’s Press.

United Nations. Undated. *Statistical Papers, Commodity Trade Statistics, according to the Standard International Trade Classification, Series D*. Statistical Office, Department of International Economic and Social Affairs. Magnetic tape.

U.S. Department of Agriculture, Economic Research Service. 1986. *Embargoes, Surplus Disposal, and U.S. Agriculture,* Agricultural Economic Report Number 564, December.

U.S. Department of Agriculture, Economic Research Service. 1994A. *Food Cost Review*.

U.S. Department of Agriculture, Office of Economics and Economic Research Service. 1994B. *Effects of the Uruguay Round Agreement on U.S. Agricultural Commodities.* GATT-1, March.

U.S. Department of Commerce, Bureau of the Census. 1994. *1992 Census of Manufacturers, Summary Services*. Bureau of Census report MC92- (p).

U.S. Department of Commerce, Bureau of the Census. 1994. *Pollution Abatement Costs and Expenditures.* Current Industrial Reports MA200(92)-1.

Valdes, C. M. 1994. “Mexico,” in *Global Review of Agricultural Policies: Western Hemisphere*, D. Roberts and D. Skully, editors. U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin Number 892, September.

Vaughan, O., M. Malanoski, D. West, and C. Handy. 1994. *Firm Strategies for Accessing Foreign Markets and the Role of Government Policy*. Agriculture Canada, Working Paper 5/94, December.

Vernon, R. 1966. "International Investment and International Trade in the Product Cycle." *Quarterly Journal of Economics*, 80:190-207.

Veugelers, R. 1991. "Locational Determinants and Ranking of Host Countries: An Empirical Assessment." *Kyklos*, 44:363-382.

Wolf, B.M. 1977. "Industrial Diversification and Internationalization: Some Empirical Evidence." *Journal of Industrial Economics*, 26:177-191.

Yu, D.J. 1990. "The Experience Effect and Foreign Direct Investment." *Weltwirtschaftliches Archiv*, 126:561-580.

Index of Terms