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The Global Competitiveness of the U.S. Food-Processing Industry

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Before the 1970s, the U.S. economy was so large relative to the rest of the world that few American economists worried about the international sector and its relation to the U.S. economy. That view has changed dramatically in the past two decades. Total U.S. trade has increased from only \$83 billion in 1970 to \$866 billion in 1990, averaging a 12.4% increase each year. Exports accounted for less than 4% of U.S. gross national product (GNP) in the 1950s and 1960s, but now exports account for about 6% of U.S. GNP. These changes have radical implications for U.S. firms and government policies. The U.S. can no longer disregard economic occurrences in the rest of the world.

The international capital market has also become much more important in the last 20 years. Countries no longer have to rely on their own economy to generate the savings necessary to fund investment and borrowings. Other countries are many times willing to loan money or invest directly in other economies if their savings rate is higher than their investment rate. Much of these international capital flows are for portfolio investment (purchasing debt obligations of another country's firms or government). However, direct investment between countries is becoming more important as national economies continue to globalize.

These changes were recognized relatively early by the U.S. agricultural industry because agricultural export markets have been very important since World War II. U.S. agriculture's health relates more to the value of the dollar and the level of interest rates than to many elements of traditional farm policy. However, there is growing concern that some sectors of the agricultural industry are not competitive in the sense that U.S. exports from those sectors are lower than "they should be." One way this concern manifests itself is debate about U.S. exports of processed food products.

The level of processing involved in most agricultural exports is currently a popular topic

(Evans). Increased exports of processed food products will not only stimulate farm income, but also provide manufacturing jobs. The General Accounting Office (GAO) recently charged that the U.S. Department of Agriculture (USDA) must rethink its priorities if it is to help increase the exports of processed foods. In particular, the GAO insisted that the USDA must engage in more strategic marketing in cooperation with the private sector.

The Foreign Agricultural Service (FAS) of the USDA classifies agricultural exports based on how close they are to their final consumer form. There are three categorizations: bulk (which are free from processing), intermediate (which are principally semiprocessed), and consumer-oriented (products that require little additional processing). In 1990, the U.S. exported 53.8% of its agricultural products in bulk form, 22.7% in intermediate form, and 23.5% in consumer-oriented form (FAS). This pattern is reversed for most European Community (EC) countries, where consumer-oriented food products account for more than 50% of their exports (FAS).

The problem is exacerbated by the fact that world trade in consumer-oriented food products has grown at a 4% annual rate during the 1980s, compared to 1% for bulk and intermediate products (FAS). Hence, as incomes across the world increase, there will likely be increased export opportunities for consumer-oriented food products. U.S. food-processing firms can reach these growing markets for processed foods in two ways: (1) by exporting processed products or (2) by establishing foreign affiliates to process food. The choice that U.S. food-processing firms make will impact income and employment levels in the U.S.

This paper deals with globalization of one part of the agricultural industry—the food-manufacturing sector.¹ The food-processing industry is extremely important for the U.S. In 1987, it ac-

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¹ For this paper, the food-manufacturing industry is Standard Industry Class 20, which is food and kindred products. It does not include tobacco products, textiles, or wood products.

counted for \$330 billion in sales (or 13.3% of the \$2.476 trillion manufacturing segment of the U.S. economy), \$18 billion in exports, and 1.45 million jobs (U.S. Bureau of the Census).² Obviously, small changes in this huge industry can have significant ramifications on the entire U.S. economy. However, foreign sales from affiliates of U.S. food-manufacturing firms in 1987 totalled \$41 billion—more than double the U.S. firms' direct and indirect exports. An analysis of why firms invest in food-processing facilities overseas is certainly needed to guide policymakers and government agencies. Finally, \$23 billion of U.S. food sales were accounted for by foreign-owned food-processing firms in the U.S. These numbers exemplify the global nature of the food-processing industry; exports, outbound foreign investment, and incoming foreign investment are all important.

This manuscript begins with a review of literature concerning the motivations behind foreign direct investment and what it indicates about the investing and receiving countries. Next, the operation of U.S. food-manufacturing parents and their affiliates is compared with the operations of other U.S. manufacturing affiliates.³ Operations of foreign-owned food-processing plants in the U.S. are outlined. These background sections lead naturally to a discussion of salient issues for U.S. food processing and needed research. Finally, potential research methods and approaches are mentioned. A key question posed throughout the manuscript is whether U.S. food-processing firms are competitive.

Review of Literature

The classical theory of comparative advantage is goods-oriented in that free, unrestricted trade is assumed and countries export goods in which they have comparatively low production costs and import goods in which they have comparatively high production costs. Each country gains from trade as long as markets are perfectly competitive and there are differences in production possibilities between countries. The only reason for trade in goods is because some factors of production (such as land and labor) cannot be moved across national boundaries.

² The base year for this study is 1987 for most information because it is the last year when foreign-investment data and U.S. manufacturing data were available.

³ The parent is the home base of the firm (located in the home country) that is investing in foreign processing facilities. Those foreign processing facilities are affiliates of the parent.

When technology and capital are mobile, or trade barriers on goods are introduced, some scarce factors of production may move instead of the goods. Direct investments or productive capital are examples of factor flows that will substitute for goods flows. Foreign investment allows the country receiving capital to capture some of the gains from the other country's superiority in production of goods without having to import the goods. However, the capital-investment flow will not totally compensate for the potential gains from free trade (Ethier). Yet, the investment-receiving country has increased employment while increasing the variety or reducing the price of the goods it imports.

The decision on foreign direct investment (FDI) is a firm-level decision. There are generally five reasons for firms to operate in a foreign country. The first is ownership advantages of the firm (e.g., patent rights, market power, access to low-cost financial resources, technological or managerial capabilities). The firm can capitalize on special advantages that it has in more markets. The second is locational considerations (e.g., high transportation costs, trade barriers, or lower production costs). These barriers are overcome through direct investment as long as foreign-owned firms receive national treatment. The third reason is the establishment of processing facilities in anticipation of future trade restrictions (Bhagwati et al.). Some argue this is why the Japanese automakers have invested in the U.S. The fourth is the reduction of exchange-rate risks for larger markets (Cushman). Foreign-exchange risk is lowered because much of the processing costs are denominated in the currency where the facility is located. Thus, only potential repatriated earnings will fluctuate in value (in the investing firm's currency). The fifth reason is tailoring of the product to local tastes when consumer needs for the product differ significantly or product specifications vary. Location of local processing facilities will allow this to occur.

All of these advantages must be balanced against the major disadvantage with respect to foreign investment—scale economies. It is well recognized within the economics literature that scale economies exist for most manufacturing enterprises. In fact from a conceptual basis, the existence of scale economies and imperfect competition is the major reason for intra-industry trade (Helpman; Krugman).⁴ Buckley and Casson argue that even when market power comes from brand

⁴ Intra-industry trade is defined as exporting and importing the same SIC classification of goods at the three-digit level.

identity or patent rights, it is often more profitable for the firm to internalize its advantages through foreign direct investment than through other forms of business organization.

There are generally two types of foreign direct investment: vertical investment and horizontal investment. Vertical investment involves a firm investing in foreign facilities to produce successive stages of the production process. An example would be if a confectionery firm had its chocolate made in Europe and exported the chocolate to the U.S. for final processing into a candy bar. The second type is horizontal investment, where a firm invests in the same type of processing in more than one country. Vertical investment is usually undertaken because of cost differences between countries, while horizontal investment is usually aimed at overcoming locational disadvantages.

Porter takes a more comprehensive view of international trade (and the theory of comparative advantage), which he labels as the theory of competitive advantage. His theory focuses on explaining the large increase in intra-industry trade in recent years and the fact that most developed countries trade with each other. His theory also helps explain why there tends to be clusters of closely related, globally competitive industries located within a country. Porter defines a particular country's industry as competitive if it exports a high proportion of its output and if its firms have a significant amount of outbound foreign investment.

His framework best explains vertical investment, where firms spin off lower-order processing activities to countries with lower wages and other costs. In this sense, foreign investment and international trade are complementary because much trade takes place between a parent firm and its foreign subsidiaries (affiliates). The parent will focus on sophisticated, high-technology enterprises in order to keep pace with its constantly upgrading labor force and rely on its affiliates to provide components.

Vernon's product life cycle is an alternative view of foreign direct investment that is similar to Porter's. During this life cycle, there are changes in production and marketing characteristics as the product matures. A key element in the model is the slow diffusion of technology or product characteristics. This dynamic model specifies four stages within a product's life cycle. Stage one is when the product or process is invented and the country (or firm) is a monopolist. As information and technology diffuse, foreign production develops and increases, restricting the markets for the initial innovator (stage two). Soon, foreign-produced goods

are competitive not only in their home markets, but also in third-country markets (stage three). As the life cycle reaches maturation in stage four, foreign-produced goods are actually imported by the innovating country. Within the life cycle, firms in the innovating country can decide to invest in foreign facilities during stage two of the cycle. However, the foreign markets must be large enough to overcome scale economies.

Most empirical studies have found that three general factors explain most of the variation in foreign direct investment by multinational firms: firm size, technological intensity, and product differentiation (Caves; Hood and Young; Wolf). All of these factors are positively related to the level of FDI. Firm size was usually measured by sales; technological intensity was usually measured by research; and development and product differentiation was usually measured by advertising expenditures.

Another important empirical question is whether foreign direct investment by home-country multinationals positively or negatively affects the home country's balance of trade. Foreign affiliates have export-generating effects for the home country through parent and other home-country suppliers' sales to the foreign affiliate, particularly just after the foreign affiliate begins operations. However, export-displacement effects are possible because foreign-affiliate sales can displace parent or other home-country firm sales in the country of the foreign affiliate and other third-country markets. The empirical findings indicate that overseas operations stimulate exports of the parent firm and other home-country firms (Horst; Hood and Young; Lipsey and Weiss). Thus, export-generating effects are greater than export-displacement effects.

Globalization of U.S.-Owned Food Manufacturers

In order to investigate the competitiveness of the U.S. food-manufacturing industry, comparisons are made with other U.S. manufacturing industries. For the purpose of this study, manufacturing is divided into 14 industries; all are at the two-digit standard industrial classification (SIC) level (Table 1). The Bureau of Economic Analysis (BEA) classifies 20 different two-digit SIC industries, but the data on foreign direct investment in the U.S. is combined for some industries (textiles and apparel (SIC 22 and 23) are combined; lumber and furniture (SIC 24 and 25) are combined; and primary metals and fabricated metals (SIC 33 and 34) are combined). Leather goods and tobacco

Table 1. Industries Included in This Analysis

Food and kindred products
Textile mill products/apparel and other textile products
Lumber and wood products
Paper and allied products
Printing and publishing
Chemicals and allied products
Petroleum and coal products
Rubber and miscellaneous plastic products
Stone, clay, and glass products
Primary metal industries/fabricated metal products
Industrial machinery and equipment
Electronic and other electric equipment
Transportation equipment
Instruments and related products

products are included in the "other" category for U.S. direct-investment data, and this category was excluded from the analysis.

In 1987, the \$330 billion in food-manufacturing sales was the second largest among manufacturing industries in terms of sales (only \$3 billion behind transportation equipment), and its 1.45 million jobs ranked seventh largest in terms of employment (Table 2). The food-manufacturing industry exports a very low percentage of its output (Table 3). In 1987, it exported only 5.4% of its output, which placed it second to the last among the 14 industries (only the printing industry was lower). The industry with the highest proportion of exports was electronics, where 32.0% of U.S. shipments were exported.

Instead of exporting, many food-processing firms have chosen to invest in foreign processing facilities (Table 3). In 1988, U.S. food-manufacturing parents held at least 10% equity in 661 foreign affiliates with total sales of \$60.26

billion (BEA). If only those affiliates that are majority-owned by U.S. parents are included, sales of affiliates totaled \$49.15 billion in 1988. The U.S. food-manufacturing industry is ranked eighth in terms of foreign-affiliate sales as a percentage of U.S. sales, significantly behind such industries as petroleum, chemicals, machinery, and transportation equipment.

The food-manufacturing industry had the second-highest ratio of foreign-affiliate sales to U.S. exports (the foreign sales/exports ratio) with a value of 2.33 (Table 3); the highest ratio was for the petroleum industry, where foreign-affiliate sales were over 12 times U.S. petroleum exports. Data from the Economic Research Service indicate that the largest food-processing companies tend to have an even higher investment/export ratio of foreign-affiliate sales to exports. For the 64 largest food-processing firms, sales of their foreign affiliates were \$40.43 billion, while their exports equaled \$3.82 billion in 1988, a ratio of 10.58. Only 1 of the top 20 food-processing firms had no foreign-affiliate sales, and these top 20 firms accounted for \$36.28 billion in foreign-affiliate sales, but only \$2.47 billion in exports from U.S. operations, a ratio of 14.69.

A measure of the importance of the foreign market can be obtained by adding exports from the U.S. to sales of foreign affiliates and dividing by U.S. shipments (this is called the international ratio). This ratio gives an indication of how important the international market is to the U.S. parent.⁵ Food-processing companies rank eleventh out of the 14 industries for the international ratio, with a value of 17.8 (Table 3). The industries that rank below food processing are printing, lumber, and textiles. The highest ratios were for petroleum (139.1), industrial machinery (60.7), and chemicals (52.1).

The international market is less important for most food-manufacturing firms than for other manufacturing firms, and exports from food-manufacturing firms are also relatively minor. However, the international market has grown in importance over time and its importance varies somewhat by food-manufacturing subsector. Foreign-affiliate sales were largest for the "other," beverage, and grain milling subsectors.⁶ There were few foreign-affiliate sales in the meat or dairy subsectors.

Table 2. Size of the Industries Analyzed, 1987

Industry	Sales	Employment
	Billion Dollars	1,000 Jobs
Food	330	1,449
Textiles	127	1,753
Lumber	108	1,209
Paper	109	611
Printing	136	1,494
Chemicals	230	814
Petroleum	130	126
Rubber/plastic	87	831
Stone/glass	61	524
Metals	267	2,159
Machinery	218	1,844
Electronics	171	1,565
Transport equipment	333	1,817
Instruments	107	982

Source: U.S. Bureau of the Census.

⁵ This will overstate the importance a bit because of shipments from foreign affiliates to the U.S. parent.

⁶ The "other" category is what is left over after the following sub-sectors are subtracted: grain milling, bakery, meat, dairy, fruit and vegetable, and beverage.

Table 3. Measures of the Importance of the Foreign Sector by Industry, 1987

Industry	Export Percent	Foreign Sales Percent	Foreign Sales/Exports	International Ratio
Food	5.4	12.4	2.33	17.8
Textiles	6.3	8.2	0.46	14.5
Lumber	7.6	1.4	0.19	9.0
Paper	14.7	9.9	0.68	24.6
Printing	4.9	1.9	0.38	6.8
Chemicals	19.1	33.0	1.73	52.1
Petroleum	10.2	128.9	12.63	139.1
Rubber/plastic	14.9	15.8	1.10	30.7
Stone/glass	7.9	8.7	1.08	16.6
Metals	20.8	6.9	0.33	27.7
Machinery	28.3	32.4	1.14	60.7
Electronics	32.0	17.6	0.55	49.6
Transport equipment	15.2	26.7	1.75	41.9
Instruments	16.0	16.1	1.01	32.1

Source: U.S. Bureau of the Census and the Bureau of Economic Analysis.

Food sales of U.S. affiliates grew 62% between 1983 and 1988, their exports grew 77%, and their imports grew 66%. Foreign-affiliate sales growth was fastest for the fruit and vegetable subsector between 1983 and 1988 (193%) and slowest in the dairy industry (only 6%). Affiliate sales for the bakery subsector also grew by over 100% during the six-year period.

If U.S. foreign investments in food processing are vertically integrated, then the facilities should be in areas of the world with lower wages than in the U.S. This would be consistent with Porter's idea of upgrading skills within a country and pushing lower-grade skills to foreign countries. However, most foreign-affiliate sales are in Europe and Canada. In 1987, foreign-affiliate sales in the European Community totaled \$25.13 billion, or over 60% of foreign-affiliate sales (BEA). Canada accounted for another 13% of affiliate sales, or \$5.43 billion, and other developed countries had sales of \$4.21 billion. Affiliates in developing countries sold \$6.46 billion in processed foods; most of that was in Brazil, Mexico, and Argentina.

Significant vertical linkages in foreign investment would also imply that a large percentage of the sales of affiliates would flow to the U.S. parent or other foreign affiliates. This is not borne out in the BEA data for food processing. Eighty percent of the foreign-affiliate sales are in the local country (\$33.02 billion of the \$41.23 billion in sales). Most of those local sales are to unaffiliated locals. Shipments to the U.S. were small (\$707 million), though most (71%) of the U.S. shipments were to the U.S. parent. The remaining \$7.46 billion in sales were to other foreign countries, with 51% going to affiliates.

European Community countries receive most of

the shipments from foreign affiliates (BEA). In 1987, affiliate exports to the EC totaled \$6.34 billion, or 77% of the foreign-affiliate exports to "other countries." Developing countries were more prominent in shipping food products to other foreign countries than to the U.S. Affiliates in developing countries only shipped \$203 million in food products to the U.S. parent while shipping \$804 million to other foreign countries in 1987. Foreign affiliates export a much higher percentage of their output (19.9% versus 5.4% for U.S. parents), but much of that trade seems to be intra-EC, where trade barriers are lower.

Finally, foreign-affiliate trade of processed food with their U.S. parents is very small—only \$707 million was shipped from foreign affiliates to the U.S., and only \$1.27 billion was shipped from U.S. parents to their foreign affiliates. If vertical strategies were prominent, one would expect more fluid trade between affiliates and parents. Further, vertical investment would imply that more of the shipments to the U.S. would come from Latin America or other developing areas. However, most of the affiliate shipments to the U.S. come from Europe (45%) and Canada (22%). Developing countries accounted for \$232 million in affiliate shipments to the U.S.

Operations of Foreign-owned Food Manufacturers in the U.S.

There is less foreign involvement in the U.S. food-manufacturing sector (relative to its size) than in many other manufacturing sectors, though the absolute numbers are still huge. Just under 7% of those food-manufacturing sales, or \$22.9 billion,

Table 4. Measures of Foreign Direct Investment in the U.S. for 14 Industries, 1987

Industry	Number of Affiliates	Total Assets	Sales	Employees	Exports	Imports
		<i>Billion \$</i>	<i>Billion \$</i>	<i>Thousands</i>	<i>Million \$</i>	<i>Million \$</i>
Food	161	24.05	22.86	142.6	518	1,641
Textile/apparel	81	3.53	3.30	40.4	90	280
Lumber/wood	44	1.72	1.80	13.9	197	228
Paper	45	6.48	6.70	46.1	410	385
Printing	77	9.78	8.30	77.2	117	117
Chemicals	190	77.35	72.11	395.8	6,849	5,200
Petroleum	255	79.67	71.99	114.9	1,186	8,971
Rubber and plastics	102	5.96	6.59	47.6	285	976
Stone, clay, glass	107	16.48	13.38	103.2	185	633
Primary/fabricated metal	227	23.17	26.66	159.3	1,507	3,680
Industrial machinery	294	13.06	13.77	109.3	1,391	2,876
Electric	181	20.37	26.58	216.8	2,048	4,758
Transport equipment	76	7.69	8.38	55.7	620	2,303
Instruments	98	6.84	6.78	64.6	680	821
Total	1,739	223.46	225.08	1,542.6	15,487	24,546

Source: Bureau of Economic Analysis.

were by subsidiaries of firms with foreign parents (Table 4).⁷ These foreign subsidiaries operating in the U.S. had assets of \$24.1 billion and employed 142,600 people. Table 4 includes data on measures of foreign direct investment (FDI) in the U.S. for all 14 industries. The chemical industry has the largest presence of foreign affiliates by many measures (sales, employees, and exports). Foreign chemical firms accounted for 31.4% of U.S. shipments. The petroleum industry is also quite large, with almost \$80 billion in assets and \$72 billion in sales. The share of foreign-affiliate sales for the food-manufacturing industry places it seventh among the 14 industries.

Obviously, FDI is important to U.S. manufacturing because it generates over 1.5 million jobs and increases the availability of products to U.S. consumers. Many of these jobs might not exist without investments by foreign firms. It is clear that most foreign firms tend to import more than they export, but nonetheless, if FDI substitutes for exports by the parent firms, the U.S. certainly imports less and exports more because of these foreign investments.

The food-manufacturing industry has one of the higher import/export ratios (3.17), indicating that foreign-owned food firms in the U.S. rely more on imports than they do on exports. Industries with low import/export ratios are paper and chemicals (where foreign-owned firms actually export more

than they import), while the petroleum industry has the highest import/export ratio (7.56). The import/export ratio for all manufacturing is 1.58.

A subsector analysis of FDI data in the U.S. food-manufacturing industry indicates that FDI is most prevalent in the beverage, dairy, and "other" categories. The "other" category alone accounts for 45% of foreign-owned company sales in the U.S. and 43% of employment. Since 1977, dairy and "other" manufacturing have seen the highest growth rate in FDI measures, while the grain milling and baking subsectors have seen the slowest increase (BEA). The meat subsector has the highest concentration of exports per dollar of U.S. sales, and foreign-owned firms in that subsector actually export more than they import. This contrasts sharply with the beverage subsector, where imports are over 14 times exports.

Most FDI in the U.S. emanates from the more developed regions of Canada, Western Europe, and Japan. European-owned firms accounted for 65% of all manufacturing sales for U.S. affiliates in 1987; Canadian-owned firms accounted for 19%; and firms owned by Pacific Rim countries (mostly Australian and Japanese firms) accounted for 11%.

Foreign direct investment in the U.S. is not a new phenomenon, but it has increased tremendously in the 1980s as part of the U.S. globalization process. Sales by foreign-owned food firms in the U.S. totaled only \$6.98 billion in 1977, but there has been a steady growth since that time. The most rapid growth for the food sector has been in assets and sales—593% and 331%, respectively. The number of employees in foreign-owned food

⁷ These sales by affiliates of foreign parents are considered U.S. sales and shipments in all Department of Commerce data. These foreign-affiliate sales are quite different from imports from foreign countries. The latter are carefully identified when discussed in this paper.

firms operating in the U.S. grew by 135% between 1977 and 1987.

All U.S. manufacturing industries experienced tremendous growth in FDI measures over these years. The fastest growth category for all manufacturing was asset value (574%), but growth in exports (489%) and imports (422%) was also quite strong. Growth in the number of affiliates and their employment was much lower than the other categories. The food-manufacturing industry has seen a slightly larger growth in assets than has all manufacturing, but other FDI measures have experienced slower growth than all manufacturing. Import and export growth has been particularly slow in food relative to all manufacturing. This indicates that much of the recent FDI activity for food products has been to reach the U.S. market. Only 2.2% of the sales from these foreign-owned food firms are exported, and imports account for only 7.2% of sales. Most foreign-owned firms in other industries export more than 6% of their output. However, it is obvious that in all industries, the FDI is basically used as a means to access the huge U.S. market and is thus a potential substitute for U.S. imports.

There has been a general upward trend in the import/export ratio for food over time too, though 1988 was a year of unusually large exports. In the late 1970s and early 1980s the import/export ratio was between 1.5 and 2.3, whereas for 1984 through 1987 the ratio was always greater than 3.0. The dynamics of importation and exportation depend upon how long a plant has been in existence and whether the acquisition was through a buy-out of existing facilities or construction of a new facility. One would think that as a firm establishes itself, its exports would increase relative to imports, but this is not consistent with the time series on food imports and exports. It could be that the recent wave of new investment keeps putting upward pressure on imports, and exports have yet to catch up.

Issues and Research Needs

Obviously, the overview sections bring up at least as many questions as they answer, and answers to these questions have implications for U.S. agribusinesses and government policy. The natural first question for the U.S. is how competitive is the food-processing sector? If it is competitive, what are the factors that make it so? If it is not, why? Some observers imply that the sector is very competitive and its foreign activities (particularly exports) should be encouraged. Are there govern-

ment policies that restrict the competitiveness of the U.S. food-processing industry, or, in contrast, could there be changes in U.S. policies or programs that could improve competitiveness? To what extent is economics (or comparative costs) involved in competitiveness anyway? Porter seems to think that competition on the basis of costs is inferior to competition on the basis of products or product quality. If the U.S. food-processing sector involves low technology and requires few job skills, it may not be best for the government to enact policies to encourage processed-food exports. Instead, increasing the number of highly skilled jobs in other manufacturing industries might do more to improve U.S. incomes.

From the analysis in this paper, the U.S. food-processing industry does not seem to be extremely competitive in the Porter sense; its international ratio is not particularly high and the U.S. is receiving significant amounts of inbound foreign investment. There could be institutional factors that cause this—trade barriers in foreign countries coupled with small markets that make foreign investment unprofitable for U.S. firms, or trade barriers in the U.S. Nonetheless, there should be further analysis, possibly on a more narrow, case-study basis, to examine reasons for this phenomenon.

It is clear that if the U.S. wants to promote exportation of high-valued processed food products, it must concentrate on the small- to medium-sized firms. The largest firms already have processing facilities overseas and are not particularly interested in exporting products. The USDA, or any other agency working to assist exporters, should be willing to work with small-scale companies that must export if their product is to reach international markets. Furthermore, U.S. food affiliates and foreign-owned U.S. food firms do not seem to obtain a significant amount of their ingredients from the U.S. Thus, it may be much more beneficial for U.S. agricultural product markets when a foreign firm builds a plant in the U.S. than when a U.S. firm builds a foreign plant. This could be a fruitful area for future research.

Another overriding question is what causes firms to invest abroad in food processing? Are investments due to country-specific advantages (cheap labor, natural resources, other comparative-advantage concepts), country-specific institutions (trade barriers, government regulations, or other institutions outside comparative-advantage concepts), or firm-specific advantages (product identity, technology, managerial skills, logistic advantages)? As the literature review disclosed, there are many theories of firm-level decisions on interna-

tionalization. However, most are envisioned from high-technology industries, where spinning off less sophisticated manufacturing elements is more important. In the food industry, product differentiation, quality assurance, and brand identity may be more important than the technology used in the production process.

The level of technology in food processing may explain the horizontal nature of investments in the international food industry. It appears that the same type of processing is performed in the foreign affiliate as in the parents, since trade between the parents and their affiliates is small and most affiliate production occurs in developed countries. Horizontal investment is feasible in developed countries where plants can reach sufficient scale to operate efficiently. Lower wages may not be a significant concern because of high capital/labor ratios in food processing. Further, trade barriers on higher-processed products could be prohibitive. Analysis of more disaggregated data would sharpen our knowledge and could reveal different trends by countries/regions or food-processing subsectors.

Three possible explanations for the pattern of international food-processing investment are (1) to escape high trade barriers on processed food products, (2) to overcome high transportation costs, and (3) to allow food products to be tailored for local conditions. There is no question that tariff escalation is prevalent for processed foods, but no study has quantified the effect of these tariffs. One could envision an analysis of the investment patterns by international food firms to determine the factors that explain the pattern over time and space.

If one understands more about the reasons for FDI, then one can understand the consequences of those actions. A crucial question concerns the effects of a country's outbound FDI in food processing on the home country's export pattern. Do U.S. food firms operating overseas encourage U.S. bulk, intermediate, or highly processed food exports? Is there a time pattern to the relationship (i.e., does the firm wean itself from home-country ingredients over time when domestic sources become more developed)? The FAS has a large budget to assist U.S. firms in exporting agricultural products. The U.S. Department of Commerce also helps exporters of highly processed food products. Little is done to assist food companies invest in overseas markets (the Overseas Private Investment Corporation is an exception to this). If outbound FDI in food processing is complementary to U.S. food exports, the USDA should consider more ef-

orts to support outbound FDI in U.S. food processing.

Another way of addressing how U.S. agriculture can access international food markets is to analyze the processing level of agricultural exports. Such an analysis might reveal the extent that economics, culture, and even politics determine the level of processing for a country's food exports. U.S. food manufacturers are notorious for attempting to sell the same food products overseas that they sell in the U.S. Thus, cultural similarity may play a prominent role in explaining the pattern of U.S. food exports between bulk, intermediate, and processed products. It may be more efficient for the U.S. to export bulk or intermediate agricultural products and allow the importing country's food processors to transform the food into its final, consumer-oriented form.

The benefits of FDI on the country of the parent and the country of the affiliate are not well known from an empirical perspective. Does the FDI-receiving country receive significant benefits in the form of new technology, demand for ingredients, etc. beyond the obvious employment-generating benefits? Many countries are liberalizing their FDI policies to attract more industries. They believe that this investment will give them access to technology that they would lack otherwise. There may be other positive externalities from FDI that these countries have missed in the past due to their restrictive policies.

In the U.S., there is much scrambling by states to attract foreign investment. However, the attitude of the U.S. federal government contrasts with individual states in this regard. Individual states promote inbound FDI through tax-reduction and other incentive packages, whereas the federal government provides no incentives or constraints (unless national security is involved). However, states complain that there are no federal institutions that provide guidelines or regulations concerning incentive packages for inbound FDI. Some states argue that this causes tremendous bidding wars between states that allow all FDI benefits to accrue to the individual firms. A better understanding of the benefits and costs of FDI might move governments to more rational policies.

Finally, the world must recognize that virtually all industries have internationalized through trade and investment. There is a need for an international organization that looks at direct-investment issues between countries (such an institution has tentatively been approved during the Uruguay Round of the General Agreement on Tariffs and Trade). Naturally, these issues go beyond food

trade and investment, but such an organization would have a significant effect on the world food system. It seems that the need for harmonizing country standards on a host of issues is becoming clear. The global market for productive capital is so fluid that firms can flee to countries with lower standards. Or, vice versa, countries may compete on the basis of regulatory standards rather than economic costs. The talks on a U.S./Mexico Free Trade Agreement have focused on some of these problems.

The world must move toward harmonizing environmental standards, business standards and regulations, competition policy, intellectual property rights, and even tax laws. This will force countries to lose some of their sovereignty in order to increase world welfare, but it is a proposition that must be addressed by some international agency. Free Trade Areas may be regional solutions to part of those problems. One might obtain a meaningful regional solution to problems while preserving more national sovereignty. However, this is an issue that the European Community has struggled with through EC 92. Obviously more research is also needed on economic analysis of optimal regulations and standards by country or region.

Research Methods

In order to obtain answers to the questions in the previous section, agricultural economists will have to shift gears with respect to their research programs. More work must be done on operations of food-processing firms and the international markets for their products. Unfortunately, many of the convenient tools used to analyze international commodity markets are not valid in many processed foods (e.g., homogeneous products and perfect competition). Agricultural economists will have to operationalize many of the new theories being developed in economics to deal with international trade in differentiated products under imperfect competition. It seems possible that many of the mathematical/statistical models used in the past (e.g., econometric analysis, game theory, and simulation) will be useful with these expanded economic models.

Agricultural economists will have to obtain data on firm-level behavior to investigate the impetus behind FDI to understand its full consequences. Some data are available from annual reports of companies, but more comprehensive and detailed data sources may be available. More analysis of BEA data would be particularly useful, especially

if individual firm data could be obtained. Again, standard statistical techniques could be used if the appropriate economic models were specified.

Finally, case studies of individual subsectors may be useful to understand the globalization process. Tracking an industry throughout time, coupled with a detailed knowledge of industry structure, could be very useful in understanding the nuances of individual firm decisions. The microlevel accuracy obtained from such an approach may compensate for problems with generalizing the results.

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