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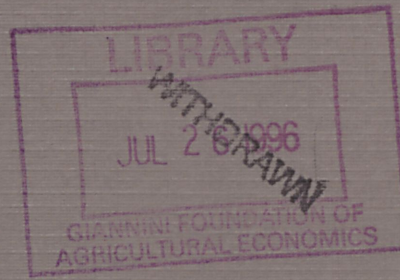
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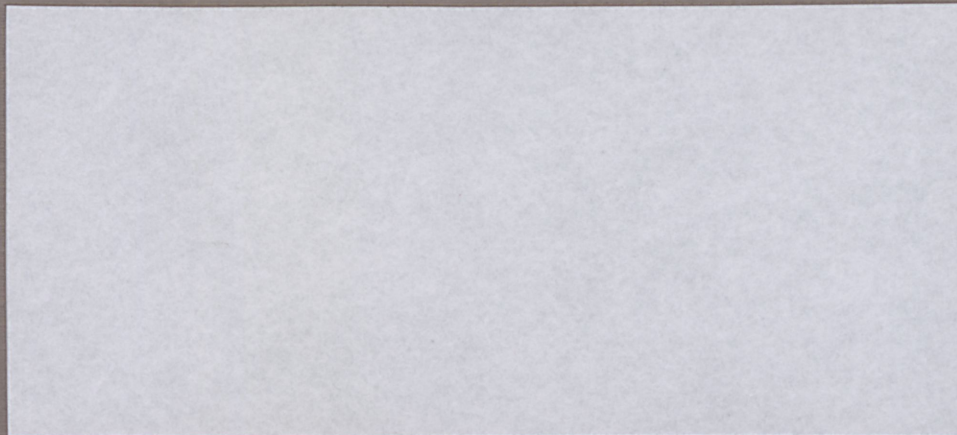
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Food, Processed



Organization
and Performance
of World Food
Systems: NC-194



OCCASIONAL PAPER SERIES

The work reported herewithin contributes to the objectives of North Central Regional Project NC-194, a joint research project of state agricultural experiment stations and the U.S. Department of Agriculture



Proceedings from the Invited Papers Session
American Agricultural Economics Association
Annual Meeting, July 30 - August 2, 1989
Baton Rouge, Louisiana

**TRANSNATIONAL STRUCTURE IN
FOOD PROCESSING AND MARKETING**

OP-1

SEPTEMBER 1989

Sponsored by NC-194, The Organization
and Performance of World Food Systems:
Implications for U.S. Policies

CONTENTS

	Page
Introduction to Invited Papers on Transnational Structuring in Food Processing and Marketing, Dennis R. Henderson	1
Multinational Structures and Strategies of U.S. Food Firms Charles Handy and James M. MacDonald	4
Research Puzzles Arising from the Internationalization of U.S. Food Processors, John M. Connor	30
Multinational Structures and Strategies of U.S. Food Firms: Policy Implications, Emilio Pagoulatos	38
Strategic Implications of the Multinational Structure of Food Processing and Marketing, Kirby Moulton and Patricia Lindsey	45 ✓

**INTRODUCTION TO INVITED PAPERS ON
TRANSNATIONAL STRUCTURING IN FOOD PROCESSING AND MARKETING**

Dennis R. Henderson, Ohio State University, presiding

(July 31, 1989)

It is widely recognized that international markets are increasingly important to the economic viability of the U.S. food and agricultural sector. During the past three decades, for example, the value of the sector's exports, when measured in real terms, has more than doubled and, when measured as a share of the sector's gross domestic product, has increased by 80 percent. Further, with an estimated income multiplier for agricultural and food exports that exceeds 2.3, the overall American economy realizes significant benefits.

It is also recognized that international marketings are highly variable. Indeed, much of the "boom" in the agricultural economy during the 1970s was directly attributed to an unparalleled rate of growth in exports, just as the "bust" in the first half of the 1980s was tied to a sharp decline. The sources and consequences of this variability have been the subject of much speculation, discussion, and research.

Closer examination, however, reveals that much of the variability has been due to wide swings in exports of primary commodities--essentially the feed grains, food grains, and oilseeds. By contrast, international sales of high-value agricultural products, including processed commodities and manufactured foods, have been more stable. Since 1980, for example, the standard deviation in the annual value of primary commodity exports has been 2.5 times larger than for high-value products.

At the least, therefore, stability argues that export markets for high-value products deserve particular attention. Furthermore, estimates of income multipliers suggest that the economy-wide gains from high-value exports (2.9) are more than 50 percent higher than those from primary commodities (1.8), mainly due to further processing and other value-adding activities.

A comparison of the profile of U.S. trade in food and agricultural products with the world market, however, raises questions regarding the international competitiveness of American firms. FAO trade data indicate that, during the past 25 years high-value products have accounted for roughly three-fourths of all world trade in agricultural products whereas they have made up less than 45 percent of U.S. agricultural exports. By contrast, more than 90 percent of U.S. agricultural imports are in high-value categories. This suggests that the American food and agricultural sector is, in essence, transferring to other countries many of the jobs and much of the income that can be earned by producing value-added products for world markets.

A seemingly obvious question is, why does the U.S. hold a relatively small share of world markets for high-value agricultural products? Conventional international trade theory, based on competitive market assumptions embodied in factor-endowment or comparative-advantage constructs, has yielded limited insight. Indeed, the theoretical foundations of the factor endowment construct are being seriously challenged. Markets for high-value products often violate competitive market assumptions such as product homogeneity and constant returns to scale. Dimensions of imperfect competition have long been recognized in domestic markets, where economists have been able to explain variations in performance by using constructs based upon industrial organization theory. Perhaps a similar approach has merit internationally.

The purpose of this session is to begin to explore international markets for high-value agricultural products from the perspective of industrial organization. The food manufacturing industries are major suppliers of such products. Thus we begin this session with an examination of the multinational structure and behavior of U.S. food processors--to what extent are there structural and/or behavioral differences that are associated with differences in international market performance? Based upon this foundation, subsequent papers address implications for our research agenda, public policy, and business strategy.

What follows may be a harbinger of a new perspective, a more robust understanding of international agricultural markets.

Multinational Structures and Strategies
of U.S. Food Firms

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and
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July 1989

This paper was prepared for the summer meetings of the American Agricultural Economics Associations, Baton Rouge, LA, July 31, 1989. We thank Naamen Siegle for assistance in data collection and preparation. The views expressed herein are not necessarily those of the U.S. Department of Agriculture.

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Multinational Structures and Strategies
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Introduction

The focus of our report should be clear from our title: we intend to analyze strategic mechanisms used by U.S. food manufacturers in an evolving world of global rivalry among firms from many nations. Several sources of evidence point to a growing geographic scope of markets, along with growing interdependence in national food industries. First, transportation costs between countries continue to decline, due to ongoing productivity growth in air and water transportation and communications (McFarland 1985). Second, many U.S. industries faced dramatic increases in import competition in the last 20 years (Eichengreen 1988), while foreign investment links into and out of the U.S. continue to expand (Lipsey 1988). Finally, trade in processed foods among developed economies continues to expand (OECD 1987).

Growing interdependence presents new profit opportunities for food firms, especially those who can effectively transfer existing competitive advantages to new markets. Growing trade, and increased investment links, may also lead to increased competition in domestic product and capital markets and an erosion of existing competitive advantages held by domestic firms and employees. Because increasing interdependence creates losers as well as winners, and because government policies may affect the size of any net gains as well as the distribution of gains, analysts and policymakers require detailed information about the sources

and effects of growing trade and investment links.

With increasing interdependence among national food sectors, firms will find themselves competing in many countries. We concentrate on those several strategies by which firms effect sales in a foreign market: licensing of a foreign manufacturer, exports from the U.S., direct investment in the foreign country, or investment in a third country with export sales to the foreign market. In many ways, U.S. food firms have made a distinctive set of choices among modes of foreign entry, especially when compared to other U.S. corporations. A company's choice among modes of foreign entry is not arbitrary; we argue that a set of product, market, firm, and government characteristics typically drive those choices. We limit our focus to sales strategies, and do not explicitly consider methods of initiating direct investment, such as the choice between acquisition of an existing firm and the construction of new facilities. Acquisitions account for almost all initial direct investment in the U.S. food industry (Pagoulatos, 1983) while Connor (1983) asserts that acquisitions account for about half of direct investment by U.S. food parents.

We highlight the particular structures and strategies of U.S. food manufacturers through the use of secondary sources and two principal databases. One is the Benchmark Survey of U.S. Direct Investment Abroad, as reported by the Bureau of Economic Analysis (BEA) of the Department of Commerce for 1966, 1977, and 1982 (1987 is forthcoming). That source provides great detail for comparisons across industries and countries and over the recent past, but

provides little disaggregated detail for firms or industries within the food sector. The BEA also produces an annual survey, which organizes data by industry of affiliate, rather than industry of parent, and reports only limited information on the overall activities of parents.¹ We'll usually refer to Benchmark Survey data on food parents, but at times will use the more timely annual food affiliate data.

The BEA data are highly aggregated, and usually refer to the food industry as a whole. We complement the BEA surveys with the results of an Economic Research Service (ERS) survey of the foreign activities of 62 leading food processors. We use the data to describe the particular strategies chosen by U.S. firms and, using applications of recent theory and comparisons across firms and industries and over time, to try to explain why such strategies are chosen.

Exports and Direct Investment Patterns - Aggregate Data

What methods do U.S. firms typically choose for foreign sales? Have their choices changed over time? Several strong patterns stand out in the BEA data.

o Major U.S. food manufacturers do relatively little exporting. Food parents in the BEA survey exported about 3.6% of domestic production in 1982, compared to an average of 11.1% for all of U.S. manufacturing. U.S. food manufacturers are also far less export oriented than food firms from other OECD countries (table 1, which reports export data for all food manufacturers, not just multinationals). The OECD reports little trend, and some modest cyclical fluctuations, in U.S. processed food import

and export shares between 1970 and 1985. Of course, the size and relative isolation of the U.S. market accounts for the domestic orientation of most U.S. producers. By contrast, countries in the European Economic Community (EC), relatively small and in close proximity to one another, have a large and rapidly growing volume of intra EC trade in processed food products.

o U.S. food manufacturers nevertheless have extensive overseas interests, through direct investment. Foreign affiliates accounted for 25.5% of the worldwide 1982 sales of U.S. food manufacturing parents with foreign affiliates, compared to 26% for all U.S. multinational manufacturing parents.

o The geographic pattern of food industry foreign direct investment has changed sharply in the last twenty years (table 2). Here, we use data organized by industry of affiliate, so that we can use the most recent evidence. In 1966, Canadian and Latin American affiliates accounted for just over one half of the sales of food industry affiliates; by 1986 the combined share was 28 percent. Increasing European sales (from 40 to 61 percent of food industry affiliate sales) accounted for almost all of the decline in share in the Americas. A weaker shift in the same direction has occurred among other manufacturing affiliates, whose European share rose from 46.1% in 1966 to 56.4% in 1986. Major U.S. food companies began investing in Canada and Latin America around the turn of the century. Horst (1974), using asset data, shows that Canada and Latin America accounted for at least 70% of all foreign food affiliate assets in each of

his 5 sample years between 1929 and 1957. The European share, which fell during the widespread destruction of the second World War, didn't begin to accelerate until the early 1960's. Thus, the dominant current European focus is a relatively recent phenomenon.

o Trade with affiliates accounts for an important share of nonfood manufacturing exports and imports. U.S. multinational manufacturers export about 11.2% of their domestic production, and about 36% of those exports are directed to their foreign affiliates, according to the Benchmark Survey. Foreign affiliates ship about 56% of U.S. multinational manufacturers' imports. But food manufacturers maintain far weaker trade links with their own affiliates; food manufacturing parents direct only 16% of their \$4.49 billion in exports to foreign affiliates, and their affiliates provide only 21% of the \$3.15 billion in food parent imports.

Food manufacturers' affiliates focus on local sales; the Benchmark Survey shows that 82% of food affiliate sales are in the country in which the affiliate is located, compared to 66% for all of U.S. based multinational manufacturers.

o Breweries tend to license use of their brands to foreign producers, rather than export or invest overseas. However, it's difficult to gauge the importance of licensing. The BEA survey reports licensing income (\$151 million paid to food industry parents in 1982), which may be underestimated because firms may report net licensing income (receipts minus payments) and because breweries with no foreign affiliates are not in the BEA survey.

These broad distinctions between food manufacturers and other U.S. multinationals are not new, and they are not newly reported. The distinctions may be related to underlying product characteristics, and in table 3 we relate several measures of foreign involvement to two important industry characteristics, the ratio of research and development spending to sales (R&D) and the ratio of advertising to sales (AD).² The data are for the 32 rather broadly defined manufacturing industries in the 1982 BEA survey.³

The two measures account for an important percentage of the variation in measures of foreign involvement across industries. Advertising and R&D have positive, statistically significant, and relatively large impacts on our measure of foreign direct investment, the share of foreign affiliate sales in the total consolidated (parent plus affiliate) sales of parents (equation 1). Compared to other firms, parents from advertising intensive industries do significantly less exporting from the U.S. (equation 2). The foreign affiliates of parents from advertising intensive industries are also significantly less export oriented than other affiliates (equation 3). The first 3 results foreshadow the evidence in equation 4: advertising intensive firms are more likely to effect sales to foreign countries through direct investment, rather than exports, when compared to other parents. Assume that an industry with an advertising intensity of .5% makes a predicted one half of its foreign sales through affiliates (and one half through exports). Then an industry with an advertising intensity of 3%, and the same R&D intensity, is predicted to make 71% of foreign sales

through direct investment. Finally, parents from R&D intensive industries have extensive foreign sales (exports and direct investment) as a share of the total, while advertising intensity has only a modest effect on total foreign sales.

Our data reported so far indicate that food company orientation toward direct investment rather than exports is not an anomaly; food industries are not outliers in the regression, and the general results appear to be fairly consistent over time. Lall (1980) showed a similar pattern for 35 broadly defined industries in 1970; Sleuwagen (1986) confirmed Lall's results, using 26 industries and some slightly different indicators of R&D and advertising, for the 1977 BEA Benchmark Survey. A United Nations report (1988) confirms a relatively heavy emphasis on foreign investment among the world's largest multinational food processors. Kravis and Lipsey (1989) use the 1982 Benchmark Survey and United Nations data on world exports to show that U.S. multinational firms are concentrated in industries that rely heavily on R&D or advertising. Broad measures of the extent of industry product differentiation seem to be consistently linked with the extent and methods of foreign involvement by U.S. firms.↵

Theories of Direct Investment

Government policies often influence the choice between exporting and direct investment. For example, high tariffs on imports may attract direct investment instead, and an uncertain climate for capital recovery may promote joint

ventures with local officials. But there also seem to be systematic industry and firm specific influences at work, and there is by now a fairly large theoretical literature that provides an underpinning for those observed effects of R&D and advertising (Caves 1982; Williamson, 1985). That literature builds on the analysis of transactions and views the firm as a substitute for various product and input markets in organizing the exchange of goods and services.

The entrant to a new country appears at first glance to bear some rather striking disadvantages. Native producers have greater experience, established distribution systems, and have likely realized any potential scale economies. If anything, such obstacles are reinforced by the cultural and political disadvantages facing a foreign entrant. Of course, elementary trade theory provides us with a source of potential cost advantages for a foreign producer, comparative advantages specific to the home country of the entrant. The firm may also possess some specific advantages, such as production or marketing innovations, or superior managerial skills. In each case however, there's an alternative to expansion of the firm: export of products or services to the foreign country via the market. Obviously, classic sources of comparative advantage can drive exports, and it's not immediately obvious why they should necessarily drive expansion of the firm via direct investment.

Contemporary theories of the firm emphasize the costs of using markets, and find that a focus on market failure can prove useful in understanding direct investment.

R&D spending fits into the analysis in several ways.

The new knowledge underlying an innovation may be transferable to production in a different country, but transfer of information is far from costless. A set of familiar appropriability problems attend the sale of information in markets.²³ Transfer of information embodied in a new technology may require a considerable investment in human, organizational, and physical capital, by each party to the transaction, in order to effectively adapt the innovation. Such investments are often "sunk" (specific to the transaction and the product) and reduce the number of potential buyers, ex post, to one. That is, the innovating firm, in attempting to export a complex new product to a new country, may create a monopsony buyer of the product (the only local organization capable of implementing the technology). Bilateral monopoly can easily lead to continuous antagonism over division of the potentially large rents from the product (Williamson 1985). Direct investment allows the innovating firm to appropriate the returns from the innovation.

In the above example, investments in R&D created a rent-yielding asset that could not be immediately duplicated by rivals. Similar processes occur in advertising intensive industries. A firm creates a differentiated product that cannot be quickly duplicated; the barriers to entry may be due to secrecy, to scale economies in production of the good, or to intensive advertising. In some firms, the marketing organization itself (including product development, manufacturing, and retail distribution) may be the source of differential advantage to the firm, and it may be quite

difficult to replicate that organization in another firm. In short, the combination of brands and organization can be a rent-yielding asset to the firm.

Successful brands and marketing organizations may be able to replicate that success in other countries, and the probability of success should be higher in countries with similar cultures and levels of economic development. Successful U.S. marketers of branded food products have developed an expertise in selling mass market items to a relatively affluent society, with a heavy emphasis on television and print advertising. If that success carries to other nations, it most likely carries to other relatively affluent societies. The convergence of incomes and tastes, and the growth of mass marketing distribution methods, may account for the relative shift of U.S. direct investment to Europe (table 2), and may lead to investment in rapidly growing Asian economies.

Successful brands may provide a basis for foreign sales, but the firm still must decide on the location of production. Transportation costs rarely account for important shares of the final price of differentiated consumer products. If production is subject to scale economies and the market is limited, the least cost arrangement is likely to be production at home and export to the foreign country. Thus export is likely to be favored for small markets (often the case for initial sales) and where scale economies in production are important. The domestic success of branded, heavily advertised food products is often based on close coordination between sales and production organizations and

on continuing contact among the sales organization, retail distributors, and consumers. While western industrialized countries may have similar cultures, continuing distinct differences of culture and retail organization require a marketing organization to be country specific. As a result, for relatively large markets for differentiated consumer products, we are likely to see direct investment rather than trade.

To summarize, in contemporary views direct investment results from the attempts by firms to gain returns on firm specific, rent-yielding assets. Such assets are prevalent in markets for differentiated products, in which rival firms may each have some degree of market power, and in which market exchanges of the assets may dilute rents. In empirical work, differentiated product industries are often characterized by intensive advertising, heavy R&D investments, or both.

Food Industry Structures and Strategies - the ERS Data

The analysis so far has been highly aggregated, and this characteristic seems to us to be a weakness of much theoretical and empirical work in the area. Many policy issues, as well as many of the interesting empirical puzzles, revolve around narrowly defined products - imports of processed hams, or frozen concentrated orange juice, or the decision to build a seafood plant in California or Indonesia. But the available empirical data (such as the BEA surveys) tend to be highly aggregated. We've attempted to generate some more detailed food industry data, at the level of the individual firm. ERS surveyed the largest food processing

firms, as reported in Food Engineering. We received useful information from 62 firms, whose total 1987 sales from U.S. food processing operations amounted to approximately \$124 billion. By way of reference, the 1986 BEA survey reports U.S. food processing sales of \$129 billion by its sample of food industry parents, which includes any U.S. firm with a foreign affiliate (or almost all of the largest food companies). Thirty one of the 62 firms in the ERS sample had foreign affiliates, and affiliate food processing sales were \$31.1 billion in 1987. The 1987 BEA survey reports total sales by food affiliates at \$41.2 billion. Our sample includes only U.S. owned firms and thus excludes the growing number of foreign owned firms in the U.S., such as Carnation or T. J. Lipton. Some large privately held firms, such as Cargill, would not participate in the survey. The survey does cover all of the major publically held, U.S. owned, branded product manufacturers as well as a number of smaller publicly held, private, or cooperatively owned food processors.

The firms provided us with data on employment, number of establishments and sales for their food processing establishments in the U.S. and worldwide, exports from U.S. food processing establishments, and total worldwide food processing sales. We report some aggregated data in table 4, for the entire 62 firm sample as well as for a two way classification ordered by food product advertising expenditures, obtained from the annual data on advertising expenditures by company and brand in 6 media categories reported in Leading National Advertisers (LNA). We split the sample into 35 heavy advertisers (LNA advertising

expenditures were at least 1% of U.S. food sales) and 27 light advertisers (less than 1% of sales).

Consider the complete sample first. The 62 firms directly exported about 2.8% of 1987 production from U.S. plants. Note that the unweighted mean, 3.2%, exceeds the sales weighted mean, indicating that smaller processors had higher export propensities. Other manufacturing industries do not show this pattern.◀

Twenty percent of the sample's worldwide food sales came from foreign affiliates (again, the sample composition differs from the BEA sample). Larger firms had greater direct investment (the weighted mean substantially exceeded the unweighted) and a relatively small number of firms dominated the results (for half of sample firms, direct investment accounted for no more than 3.5% of worldwide sales). Foreign affiliate food sales exceeded \$1 billion for 10 firms.

Exports account for a small share of total food sales to foreigners by major U.S. processors (10.0%). But notice that the unweighted mean (48.2%) and the median (38%) far exceeded the weighted mean. Exports are a likely foreign sales strategy for firms with small foreign sales, but unimportant for the largest firms with the greatest foreign exposure.

Now consider the evidence when we split the sample according to advertising intensity. Light advertisers export more (5.7% of U.S. food sales, compared to 1.4% for heavy advertisers). Light advertisers account for 2/3 of sample food exports, and exports account for 44% of foreign sales by light advertisers. By contrast, heavy advertisers orient

their strategy strongly toward direct investment, which accounts for 96% of their total foreign sales.⁷

Advertising does not have a strict causal connection to strategic choices, but rather indicates a set of industry characteristics revolving around product differentiation. Exports are concentrated in firms such as Archer Daniels Midland, Iowa Beef Processors, Conagra, Riceland Foods, and General Foods (coffee), whose products are relatively homogeneous and subject to an initial stage of processing: meats, oils, rice, flour, and coffee. These commodities require relatively little marketing support and hence are sold in market transactions to foreign wholesaling and processing firms. Direct investment seems to be most important for large firms such as Coca-Cola, CPC International, RJR Nabisco, Kraft, Heinz, and General Foods (noncoffee brands), that sell a diversified range of branded consumer products through retail outlets. Competitive advantages for such firms arise from their marketing organizations, and from close connections among advertising and promotion, retail distribution, and product development and manufacturing. These firms coordinate foreign sales through the firm's organization, and therefore via direct investment, rather than through markets via exports.

A small number of sample firms dominate foreign sales activity. The four largest sample firms account for 23% of U.S. food shipments by sample firms, but the four largest direct investors account for 46% of foreign affiliate food sales, and the four largest exporters account for 58% of sample food exports. The relatively high concentration of

foreign sales activity suggests either scale economies or nonreplicable firm specific skills attached to successful foreign marketing.

Retrospect and Prospect

Horst (1974) studied foreign investment by U.S. food processors in a period covering 1890 to 1970. Meat packers and condensed milk manufacturers, extending their new technologies to other countries, initiated successful large scale foreign investment. Over time, knowledge of the new techniques diffused widely, leaving the firms with no permanent competitive advantages; for example, the meat packers all divested their overseas operations by 1960. Firms from advertising intensive industries, who successfully marketed differentiated consumer products, carried out later waves of foreign investment aimed at countries with expanding middle classes, centralized distribution systems, and extensive advertising media. In 1970, advertising was strongly associated with the extent of foreign investment, although there were many anomalies, in the form of large consumer products companies with very limited overseas interests (Horst 1974).

Horst's trends have intensified since 1970, exemplified by the increased emphasis on investment in Europe (table 2). Three developments are likely to affect the pace of direct investment in food processing in the near future. First, as their economies come to resemble ours, European firms have sharply increased investment in the U.S. (Lipsey, 1988; MacDonald and Weimer, 1985). Second, as trade barriers among

European countries fall in 1992, we will see an expanded, European market for many products (Emerson, et al., 1988). We should see a restructuring of the European food industry toward multinational (European) brands and bigger plants, and the shifts may attract expansion by existing multinationals, including U.S. firms, in Europe. Finally, as the economies of the Pacific rim continue to grow, and as Pacific rim food consumption shifts to more highly processed and differentiated products, we may likely see increasing investment links, in each direction, between food firms in the U.S. and the Pacific rim.

Conclusion

According to unpublished statistics provided by the Foreign Agricultural Service of USDA, the United States accounts for 21% of world exports in bulk agricultural products, but only 5% of world exports of consumer oriented processed food products. Moreover, since the late 1970's, the U.S. has been running relatively large trade deficits, of \$5 to \$6 billion annually, in consumer oriented processed food products while the European community has shifted from trade deficits to trade surpluses, of around \$2 billion annually, in those products.

A variety of industry observers and policymakers sense that processed food exports can be expanded, and see in that potential expansion a source of increased demand for upstream agricultural commodities, leading to increased farm incomes.

The relatively low export share does not imply that major U.S. food manufacturers have no international interests

or activities. Rather, U.S. firms pursue extensive forms of direct investment in the food industries of foreign countries. The overseas affiliates sometimes directly displace exports, and maintain some small trade linkages with parents, but in general they have only modest trade effects. At present, the advantages that U.S. corporations hold in the food industries of the world are not generally based on commodities produced in the U.S., and therefore on immobile factors of production such as land or skilled production labor, but rather on more mobile factors such as information, financial capital, and managerial labor. By and large they have not found exports to be a relatively effective foreign sales strategy.

Some U.S. food processors have chosen export strategies over direct investment, and appear to have been successful. We need more detailed information on why a few firms seem to succeed at the export strategy, and why several European firms have developed successful export strategies to the U.S. It appears to us, however, that any large expansion in processed food exports from the U.S. requires the development of either differentiated commodities (not differentiated products based on generic commodities) or a set of marketing institutions, specific to U.S. products and at least equivalent to the institutions of direct investment, that will induce U.S. multinationals to choose an export strategy.

Table 1: Trade in Processed Food in OECD Countries

Country	Import Penetration*			Export Shares*			
	1970	1975	1985	1970	1975	1985	

	Percentages						
Australia	5.3	5.4	6.9	..	38.0	37.3	24.0
Austria	21.0	19.0	12.2	..	7.0	11.5	7.6
-Belgium/Lux.	34.2	40.2	65.3	..	30.4	39.3	68.7
Canada	8.7	11.0	8.2	..	7.3	5.5	7.9
Denmark	25.0	23.0	18.9	..	48.0	53.0	41.8
Finland	10.6	10.5	8.2	..	4.7	4.4	5.2
-France	10.2	11.5	15.0	..	7.9	11.1	13.4
-Germany	21.2	21.9	27.3	..	7.2	13.4	21.5
Greece	28.0	16.0	25.5	..	18.0	15.0	16.4
Italy	19.7	25.9	27.4	..	6.2	9.0	12.4
Japan	6.8	8.6	5.8	..	3.4	1.4	1.0
Netherlands	14.0	26.5	39.7	..	40.6	44.5	55.1
New Zealand	11.0	13.0	12.2	..	62.0	57.0	66.1
Norway	12.0	11.5	10.6	..	17.2	15.6	13.0
-Spain	16.0	16.0	7.1	..	16.0	12.0	7.9
Sweden	14.1	15.1	14.8	..	4.2	5.0	7.8
-United Kingdom	20.5	23.8	21.8	..	3.9	7.3	7.9
United States	4.8	4.6	4.8	..	2.9	3.4	3.1

*Import penetration: imports as a share of apparent consumption (production less exports plus imports); export shares: exports as a share of production.

Source: Organization for Economic Cooperation and Development (1987).

Table 2: Sales of Food Industry Affiliates of U.S. Parents and Sales Share by Region, Selected Years

Year	Food Affiliate Sales	Regional Shares of Sales			
		Canada	Latin America	Europe	Rest of World
million \$		- percent -			
1966	5339	30.3	20.5	39.5	9.6
1977	21756	25.2	17.8	46.1	10.9
1986	37599	14.9	13.1	61.0	11.0

Sources: 1966-U.S. Direct Invest Abroad 1966. Part II: Investment Position, Financial and Operating Data, Bureau of Economic Analysis (January 1972); 1977-U.S. Direct Investment Abroad 1977, Bureau of Economic Analysis (April 1981); 1986-U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates, Preliminary 1986 Estimates, Bureau of Economic Analysis (June 1988).

Table 3: Effects of R&D and Advertising on Foreign Activities by U.S. Manufacturing Firms

Foreign Activity	Intercept	RD	AD	2	
				R	F
(1) <u>Affiliate Sales</u> Consolidated Parent Sales	-1.493 (18.86)	.341 (4.57)	.233 (3.66)	.51	16.87
(2) <u>Export Sales</u> Consolidated Parent Sales	-2.929 (22.47)	.126 (.573)	-.338 (3.15)	.22	5.16
(3) <u>Affiliate Exports</u> Total Affiliate Sales	-.776 (8.55)	.115 (1.35)	-.195 (2.66)	.19	4.52
(4) <u>Affiliate Sales</u> Export & Affiliate Sales	1.501 (10.13)	.200 (1.43)	.510 (4.28)	.38	10.06
(5) <u>Affiliate & Export Sales</u> Consolidated Parent Sales	-1.174 (16.85)	.333 (5.08)	.105 (1.87)	.47	14.47

t statistics are in parentheses.

Note: The independent variables are transformed to natural logarithms, and the foreign activity shares, p_i , are transformed to a logistic form, $\log(p/i - p_i)$, for regression. The logistic form keeps predicted values in a range of zero to one and removes heteroscedasticity.

Data Sources: Dependent variables are calculated from data in U.S. Bureau of Economic Analysis, U.S. Direct Investment Abroad: 1983 Benchmark Survey Data (1985). Independent variables are calculated from 1977 Federal Trade Commission Line of Business data.

Table 4: Foreign Operations of 62 Leading
U.S. Food Processors, 1987

Foreign Sales Measures	All Firms (n=62)	Heavy Advertisers (n=35)	Light Advertisers (n=27)

- percent -			
1) <u>Food Exports</u>			
<u>U.S. Food Shipments</u>			
- unweighted mean	3.1	1.9	4.7
- median	1.7	1.5	2.3
- mean, weighted by U.S. shipments	2.8	1.4	5.7
2) <u>Foreign Affiliate Food Sales</u>			
<u>Worldwide Food Sales</u>			
- unweighted mean	12.1	18.0	4.4
- median	3.5	15.7	0
- mean, weighted by worldwide food sales	20.1	25.2	6.8
3) <u>Exports</u>			
<u>Total Foreign Sales</u>			
- unweighted mean	48.2	27.9	73.9
- median	38.0	4.9	100
- mean, weighted by total foreign sales	10.0	4.0	44.0
- Billions -			
4) <u>Firm Characteristics</u>			
Mean U.S. Food Sales	2.00	2.39	1.49
Total Exports	3.45	1.17	2.28
Total Affiliate Sales	31.12	28.22	2.90

Source: Unpublished survey data, Economic Research Service,
U.S. Department of Agriculture.

Footnotes

¹An affiliate is a business enterprise located in a foreign country that is owned by another business enterprise (the parent) located in the United States. We use data on majority owned affiliates, whose U.S. parent own at least 50% of the voting stock. The industry of a parent (or affiliate) is that SIC designation that accounts for the largest share of parent sales. Food parents may have nonfood sales, and nonfood parents may own food industry affiliates. Despite this potential problem presented by diversification, the two surveys still capture a large core of the same activities. Food industry parents usually invest abroad in food industry affiliates (food affiliates account for 73% of food parents sales from all foreign affiliates). And, most food affiliates were owned by food industry parents (86% of all food affiliates sales).

²The measures of foreign involvement are all derived from the 1982 BEA Benchmark survey. That report also lists R&D spending by parents, but does not list advertising expenditures. We used R&D and advertising measures from the same source, the 1977 Line of Business statistics reported by the Federal Trade Commission. FTC Lines of Business are more narrowly defined than BEA industries, so we could aggregate to the BEA level. The difference in sample years (1982 versus 1977) should not be important, since advertising and R&D intensities tend to be rather stable over time.

³For example, the BEA survey places food firms in 3 industries: grain mill and bakery products, beverages, and other food products.

⁴Other studies of foreign strategies find associations with advertising and R&D. For example, Gatignon and Anderson (1988) investigate the extent of ownership control (wholly owned, majority stockholder, equal partner, minority partner) exercised by U.S. parents over affiliates. Advertising intensity had a large, positive, and statistically significant impact on the likelihood of 100% ownership. Franko's (1987) case studies analyse the extent of minority and equal partner participation in direct investment in developing countries, and finds that advertising intensive food firms are far less likely to participate in such relations; those firms show a clear preference for wholly owned affiliates.

⁵The seller must reveal the content of the information, in order that the buyer can affirm its value. However, revelation of content, in the absence of well defined property rights to the information, eliminates the buyer's incentive to pay. Markets in pure information are subject to failure, and the firm may embody the information in a tangible product, with well defined property rights, in order to gain a return on the information (Caves 1982).

⁶These are direct exports by the company. There will also be some indirect exports, by domestic third parties who buy from the U.S. producer and then export. Our specific interest lies in the marketing strategies chosen by manufacturers, and we do not consider those third party actions. The 1982 BEA survey reports that exports were 3.6% of U.S. production, but that sample covers firms with foreign affiliates, and therefore some degree of foreign orientation, while ours covers the largest U.S. food processors. Our data refer to processed food only, while the BEA data cover all sales of parents whose major activity is food processing (including sales of unprocessed agricultural products, a major U.S. export). The OECD estimated export share for all U.S. food manufacturers in 1985 was 3.1% (table 1). The OECD sample is more likely to include privately held grain processors, such as Cargill, who did not participate in our survey and are important exporters. The Census Bureau reports that U.S. food establishments exported 4% of shipments in 1987. The Census survey includes foreign owned plants, plants of Cargill, and the plants of many smaller producers.

⁷We can summarize differing foreign sales strategies among sample firms with the following regression:

$$\text{EXSHARE} = 1.888 - .302 \text{ ADV} - .165 \text{ LSALES}$$

(5.04) (3.09) (4.23)

$$F = 21.93 \quad R^2 = .43$$

where EXSHARE is exports divided by the sum of exports and affiliate sales, ADV is a dummy variable equal to 1 for firms with advertising to sales ratios of at least 1%, and LSALES is the logarithm of total company sales. Size and advertising have large, negative, and statistically significant effects on the use of exports to channel foreign sales.

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Draft of 8/3/89

RESEARCH PUZZLES ARISING FROM THE INTERNATIONALIZATION
OF U.S. FOOD PROCESSORS

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Prepared for the Invited Papers Session, "Transnational Structuring and Food Processing and Marketing," at the annual meetings of the American Agricultural Economics Association, Baton Rouge, Louisiana, July 30-August 2, 1989.

August 1989

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Handy and MacDonald provide a timely analysis of the global sales strategies of U.S. food processors. My purpose is to supply some complementary information on the international sales activities of U.S. food processing firms and to suggest future avenues for research on these issues.

Foreign Direct Investment

The growth of foreign direct investment (FDI), both into and out of the United States, has been extraordinary. From 1977 to 1987 the value of U.S.-owned FDI in food manufacturing affiliates grew by 125%; during the same period FDI into the U.S. food manufacturing industries soared 790%. There are certain features of these parallel capital flows that are not sufficiently explored by Handy and MacDonald.

First, one rather consistent feature of FDI is that of geographic "cross-penetration", the two-way flows that occur between countries at similar levels of development. Cross-penetration (or reciprocity) of FDI holds in the long run for individual industries as well as broader sectoral groupings (Connor 1977). Unlike international portfolio investment (such as bonds), but like trade in differentiated products, FDI flies in the face of comparative national advantage based on immobile factors of production. The suggestion that mobile tangible and intangible assets drive FDI flows seems to be correct. The major geographical shift in U.S. food processing FDI since the 1960s from Canada and Latin America to Europe appears to be an intensification of cross-penetration. The reasons for increased cross-penetration between the U.S. and Europe are unlikely to be simply the convergence incomes, preferences, and food distribution systems (indeed the U.S./Latin American convergence may have been relatively greater).

There is one geographic pairing for which reciprocity in FDI may be breaking down, namely, Japan and the United States. In 1987, U.S. assets owned by Japanese investors (\$197 billion) doubled over 1986 levels, and these large flows of investment appear to have been sustained in 1988-1989. Japan is now the largest single owner of U.S. assets, having jumped from third to first place in 1987. By contrast, U.S. assets in Japan were much lower in 1987, about \$88

billion or 44% of the Japanese stake in the U.S, and increasing much more slowly. One reason for the imbalance in Japanese/U.S. FDI may be the crushing U.S. net overseas debt, which by the end of 1988 had reached \$533 billion. The U.S. was a net creditor until 1984, but by 1992 net U.S. debt is expected to reach \$1 trillion. The puzzle is why cross-penetration has risen for U.S./European FDI but has slackened for U.S./Japanese FDI.

One market-structure explanation of cross-penetration is that it represents strategic responses of rival firms to an incursion of a rival effected by FDI. By reacting in this way, interfirm rivalry develops along more geographic contact points, which may induce more forbearance between rivals. A related cooperative strategy is the bunching of initial investments in the same industry-country locations first detected by Knickerbocker. His test was fairly crude (three-digit SIC and affiliate counts only). Data are available to test this bunching notion for inward U.S. FDI.

A second feature of FDI not mentioned by Handy and MacDonald is the mode of entry. Since data began to be collected in the late 1970s, about two-thirds of the value of investment outlays on U.S. affiliates in all industries has been via mergers and acquisitions. In food processing, virtually all new foreign investments are by acquisition, and most deals are effected through already established foreign-owned U.S. affiliates that borrow most of the capital for the takeovers from U.S. financial institutions. (Scattered evidence supports the view that U.S. investors abroad also enter new markets primarily by merger.) A major mystery is why foreign investors so strongly prefer takeovers to de novo establishments. Moreover, one may ask why foreign investors appear to have an advantage over presumably better informed local investors in the market for firms (assuming the market for firms is an efficient), or why (if it is not efficient) foreign investors consistently overvalue takeover targets compared to local investors.

Third, the assumption that profits are the sole objective of FDI is in some doubt. The returns from FDI in the U.S. manufacturing sector are quite low

(Table 1). Foreign-owned manufacturing enterprises returned a paltry 2.5% on the equity and long-term debt held by their foreign parents during 1983-1987, a period of fairly robust growth and profitability in the United States. European affiliates did better than the average foreign manufacturing affiliate, but even so they earned rates that were less than half that of domestic manufacturing firms. Japanese manufacturing affiliates reported huge losses (\$511 million from 1983 to 1986), finally turning a profit only in 1987. Rates of return are somewhat closer to U.S. norms in food manufacturing, and the rates are much steadier over time (as indicated by the low standard deviations). Again, however, Japanese investors saw practically no returns from their food manufacturing investments in the 1980s. Perhaps Japanese investors really do have incredibly lengthy investment time horizons, or perhaps their relatively young affiliates have not yet found the right strategies to prosper in the U.S. economy.

Also quite remarkable is the contrast between rates of return from inward U.S. FDI (Table 1) and outward FDI by U.S. companies (Table 2). U.S. manufacturing affiliates abroad had rates of return that were more than five times the rates of return on comparable foreign investments in the U.S. (These data are collected by the same agency using identical definitions.) U.S. food manufacturing affiliates abroad were more profitable than other manufacturing enterprises. U.S. food processing operations in Japan were 90 times more profitable than Japanese food processors in the U.S. The relative maturity of U.S. FDI certainly explains part of this paradox, but mostly we are left wondering about the strength of the profit motive to explain FDI (Lupo, et al.).

Licensing

Handy and MacDonald cite the usual three means of serving international markets: FDI, exports, and licensing. But after mentioning licensing on the first page, there is no further discussion. This is not surprising, as official data on licensing by U.S. firms is practically unavailable. The main reason is that, unlike several late developing countries (LDCs) registration and approval of licensing contracts is not required in the United States. The several

studies available on licensing agreements are based on data from LDCs that review royalty and management service contracts so as to close loopholes for transferring profits to the parent companies. An interesting study based on Indian data found some strong relationship between market structure and licensing (Kumar). Surveys of the licensing practices of food manufacturers would greatly expand our knowledge of global sales strategies.

International Trade

There are several measurement and analytical challenges relating to international trade in processed foods, several of which are addressed by Handy and MacDonald. Their analysis focuses on direct exports of U.S. food manufacturers, which overlooks the substantial portion of U.S. processed food exports handled by freight forwarders, food wholesalers, and other distributors. A study by the Census Bureau of 1984 U.S. exports calculated that 40% of processed food exports were indirect, i.e., unknown to the manufacturers that made the products. Why some firms internalize export wholesaling and other firms delegate the activity depends on a number of factors whose relative weights are unknown at present.

The question of intrafirm international trade is a fascinating topic. Handy and MacDonald report that intrafirm trade by U.S. food processors amounted to 19% in 1986. However, a study by Helleiner and Lavergne reported that the degree of intrafirm trade rises with the degree of processing; in 1977, fully 54% of finished manufactures imported were intrafirm. In addition to the discrepancy between food and other manufactures, an unresolved research question is whether intrafirm trade behaves differently from arms'-length trade.

Handy and MacDonald's empirical models explaining exports or foreign affiliate sales intensities offer a starting point for understanding the foreign sales strategies of U.S. food manufacturers. While the rationale for including advertising intensity is clear, the hypotheses underlying R&D intensity are not developed satisfactorily. The authors' theoretical discussion appears to interpret R&D as a proxy for high-tech, high-sunk-cost industries. I doubt that food manufacturing falls squarely into this category. R&D intensity probably signals

the presence of a new product development program, in which case it is merely an alternative basis for product differentiation (compare Imel and Helmberger). This interpretation is consistent with Handy and MacDonald's results that show R&D nonsignificant when AD is negative and R&D positive when AD is positive.

A much fuller explanation of the determinants of foreign sales strategies is suggested by previous empirical models of the determinants of variations in foreign direct investment ratios (Connor 1981; Connor 1983). In particular, models similar to Handy and MacDonald's Equations (1) and (5) have found that market failure due to small numbers is an important explanatory factor. High home-country market shares or industry concentration act as repellents, while high host-country concentration is an attractant. Whether small numbers affect export behavior is an open question. Also, whereas tariffs appear to be weak or negligible, harder-to-measure nontariff barriers very likely have strong effects on both export and investment behavior. Empirical support of these hypotheses is scanty.

Another interesting extension of Handy and MacDonald's work is the question of the export-investment trade-off. Some previous work appears to show that manufacturers that become more export oriented over time reach a maximum export propensity of 10 to 15%, above which foreign sales through affiliates become the dominant strategy (Caves). These results, if they hold today for food firms, are pregnant with policy import. They suggest that export enhancement programs should be targeted to firms with low export propensities and should cease when firms become moderately successful. However, the research base is probably too thin now to make solid policy recommendations.

The Handy-MacDonald analysis is a modest step forward in understanding the market structure-conduct relationships that drive foreign sales strategies. I hope that once we have a clearer understanding of the strategic underpinnings, we will move on the most critical element of the industrial organization triad, namely, performance. Surely, more exports or foreign investment are not always to be preferred to less. But what guidelines can we develop, preferably grounded

in welfare theory, that would identify optimal levels of foreign sales? When market failures at least in part drive foreign investment and export behavior, will there not be a conflict between national and world welfare standards? National welfare criteria will probably argue for the creation of rents in the international trade markets and the capture of those rents for the nation, whereas a world welfare standard will conclude that the elimination of rents is the most desirable state.

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Table 1. Rate of Return on Foreign Direct Investment into the U.S. Manufacturing Sector, by Area, 1983-1987 Average.

Area of Ownership	All Manufacturing Affiliates	Food Manufacturing Affiliates
	(Percent)	
Europe	4.3 (2.0)	7.3 (1.6)
Japan	-1.8 (7.7)	0.8 (3.7)
World	2.5 (2.5)	7.0 (1.7)

Note: The rate of return is net income from foreign direct investment (FDI) divided by the average stock of FDI at the beginning of the year and FDI at the end of the year. Net income is the portion of total affiliate earnings accruing to the foreign owners of voting stocks, less U.S. withholding taxes on earnings, plus interest on long-term debt owned by the foreign parent. The average is an unweighted mean of the five years. Standard deviation given in parentheses.

Source: Survey of Current Business (August 1988 and previous issues).

Table 2. Rate of Return on Foreign Direct Manufacturing Investment by U.S. Companies Abroad, by Area, 1983-1987 Average.

Location of Investment	All Manufacturing Affiliates	Food Manufacturing Affiliates
	(Percent)	
Europe	16.3 (12.1)	16.4 (9.8)
Japan	23.0 (11.7)	71.3 (30.3)
World	14.0 (7.6)	15.9 (7.1)

Note: See Table 1.

Source: Same as Table 1.

The paper by Handy and MacDonald presents some evidence on the internationalization of the U.S. food processing industry. It also makes references to the recent trend towards global multi-national food firms in Europe, Canada, Japan, and the United States, all competing via direct investment, licensing arrangements, or brand differentiation in one another's markets. Handy and MacDonald's information on U.S. food manufacturing indicates that

- a) foreign direct investment (and licensing in the case of breweries and soft drink firms) has been the preferred mode of international expansion rather than exploring export opportunities. These strategies are attributed by Handy and MacDonald to the roles of research and development and advertising as proxies of technological progressiveness and product differentiation respectively.
- b) a substantial portion of trade by these firms represents "intra-firm" trade with their foreign affiliates, and
- c) foreign direct investment in food processing has now become two-way, with not only U.S. firms investing abroad but increasingly, foreign firms investing in the U.S. market.

While the Handy and MacDonald paper provides a useful addition to the scant literature on the global food processing industry, our knowledge to date is too limited to derive any policy recommendations. I will therefore concentrate my remarks on some recent developments in trade theory that may shed some light on policy and provide a guidance to future research in this area.

First, however, it is necessary to complete the picture of global competition in food and tobacco manufactured products presented by Handy and MacDonald by making reference to recent work on the industrial organization of this sector [Connor et al., O.E.C.D.]. Several food industries in the U.S. and other OECD countries exhibit market structures characterized by monopolistic

competition or oligopoly behavior. In many of these markets there are a small number of competitors who are price setters and who are aware of the interdependence of their actions and those of their rivals. Often there are increasing returns to scale, and there is imperfect information about products or prices. In addition, product turnover and brand differentiation are typical means of nonprice competition.

Given these additional stylized facts about the world food manufacturing sector, the appropriate models that attempt to capture some of these aspects of international competition and foreign direct investment are those proposed by Helpman and Krugman (1985, 1989) and Brander and Spencer, known as the industrial organization theory of trade. This new theory presents a rich theoretical framework that can be the basis for a systematic empirical analysis of international competition in processed food products.

The new approach makes a break with the Ricardo and Heckscher-Ohlin models of trade by emphasizing the importance of increasing returns to scale and imperfect competition in the international economy. It generates predictions that are closer to reality than its alternatives. In particular, it can account for actual trade patterns that involve the presence of two-way or intra-industry trade in goods of similar factor intensity, the presence of intra-firm trade and foreign direct investment, and the concentration of trade among countries with similar relative endowments of factors of production. This literature has also questioned the economists' attachment to the free trade ideal.

In a world of perfectly competitive markets, interventions in terms of tariffs, quotas, domestic or export taxes and subsidies, cannot improve aggregate welfare. A well known exception is the case of large countries which can benefit from trade interventions for the purpose of

improving their terms of trade. This result, however, assumes that no domestic policies (like output subsidies) are used, and that trading partners do not retaliate.

In a world in which economies of scale and imperfect competition are present, the new trade models identify conditions under which so-called "strategic trade policy" is superior to free trade. Decreasing unit production costs and market structures that contain monopoly elements are common in industries involved in international trade. Market imperfections and the absence of Pareto optimality immediately suggest the potential benefits of government intervention. In the strategic trade policy argument, government policy can alter the terms of competition to favor domestic over foreign firms and shift the excess return to monopolistic markets from foreign to domestic firms. This provides an argument for activist trade and industrial policies if it can be shown that they improve a country's position by enhancing the ability of domestic firms to secure a larger share of world markets in which imperfect competition and, thus, high rents are present. It should be noted, however, that a number of questions arise regarding the robustness of the theoretical argument, and the feasibility of implementing activist trade policies in practice (Grossman).

Whether food manufacturing industries should be targeted for strategic policy interventions, however, remains an unanswered question. At this point we have very little information on the precise nature of market structures, firm conduct, and the nature of scale economies in specific industries at home and abroad. Much more must be known about the nature of the global competitive environment before empirical results can be translated into policy actions. We need to build imperfectly competitive trade models which incorporate the types of institutions prevalent in world food processing markets. Empirical estimation of market parameters can then result in inferences about the nature of the competitive process.

Another argument advanced to justify targeting industrial and trade policies to food manufacturing as a means of raising national income is based on the high value added nature of these industries (U.S.D.A.). This is not a defensible argument for government intervention because, as Krugman (1989) has pointed out, these are also industries with high value added per worker and high capital output ratios, and, therefore, targeting them could result in the opposite outcome, namely slower growth and unemployment.

Finally, a policy issue that needs to be addressed with reference to the food industry is the proposed single market unification of the European Community countries in 1992 and its implications for world food trade and investment. As all internal trade and factor mobility barriers are expected to fall by that date, leaving a unified market of 320 million people, the world trading system may be altered in ways that are not entirely predictable at this time. Expected changes in the structure of industry include the realization of economies of scale in production and distribution, the improvement in the quality and variety of products offered to consumers, the improvement in firm's organizational structure, and the promotion of technical progress and the diffusion of innovation.

The completion of the EC internal market raises a number of questions. For example, it is still unclear whether this will result in a "Fortress Europe" or a more attractive market for firms both within and outside of the Community. Will the wider market accelerate the flow of foreign direct investment and the process of firm consolidation through mergers and acquisitions? Will this change in the global competitive environment result in net world welfare gains or losses? These are all relevant research questions that, if addressed, will enrich our understanding of the world food industry environment.

My conclusion is that empirical research of international trade and investment in the global food processing markets is very promising. The issues (GATT negotiations, global restructuring, 1992 European integration) are extremely timely. The conceptual framework, the industrial organization approach to trade theory and policy, is available. I hope that this session will provide the last ingredient: motivation to do the needed research.

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Strategic Implications of the Multinational Structure
of Food Processing and Marketing

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This paper was prepared for the summer meetings of the
American Agricultural Economics Association
Baton Rouge, Louisiana
July 31, 1989

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Commodity wide research and export promotions programs implemented through marketing orders, commissions or trade associations may be one such institution that favors exports over direct foreign investment. The programs provide representation in foreign markets, evaluate changing conditions, and seek to differentiate the U.S. (or specific regional) product from that of competitors.

The case studies reported by the Agricultural Issues Center of the University of California assert that industries with a high degree of organization, including cooperative structures, marketing orders and commodity commissions tend to be successful due to collective action in research and marketing. Industries cited include citrus, almond, strawberry and raisin; with the contention that the cling peach industry did relatively well in a declining industry due to organization. In these examples, collusion is permitted in order to achieve certain industry objectives, excluding price collusion or allocation of markets to individual firms. Despite legal restrictions, these structures also serve to increase market power, a consideration which may be critical when either the competitor or the purchaser is an entire government rather than individual firms.

The effects of marketing order decisions have been evaluated by Nuckton, French and King, and Bushnell and King, among others, but with primary emphasis on domestic markets. Moulton, based on an ongoing investigation (1989) of global competition in canned peaches and pears, believes that the promotion program for canned

peaches has been effective in supporting a premium price for California peaches relative to those from Greece and South Africa in the Japanese market. It appears that a fruitful line of research is to analyze the impact of such programs on exporting strategies.

The spread of technology through direct foreign investment in low cost producing areas can create problems for U.S. processors without foreign sources of supply. This has occurred in frozen vegetables and processing tomatoes as the result of investments in Mexico. However, the rate of technological change can be used as a protective strategy by industries in some situations. Moulton and Runsten describe the "rush" of technology that allowed the California processed strawberry industry to outdistance the lower cost Mexican industry.

This situation contrasts with that in the frozen vegetable industry and suggests that the type of integration involved in foreign investment is important. In the case of strawberries, investments were made by brokers or small scale processors and the integration was as much vertical as horizontal. The investors were knowledgeable about current technology but unable to keep up with the rapid pace of change stimulated by research investments by the California industry. The major investors in the Mexican frozen vegetable industry were Birds Eye, Green Giant and Campbells. They were at the leading edge of technical change because of their large U.S. operations and could readily extend new technology to their

Mexican operations. The key in this situation was the horizontal integration of production units that facilitated technology transfer.

Explicit assumptions about the ease and speed of adoption of new technologies in different geographic areas have been used in conjunction with quantitative models or estimates. An example of this is the Nelson and Unnevehr study of the international poultry market. The expectation of continued innovation is also key to the assumptions underlying Baldwin and Krugman's model of the market of 16k RAM chips.

Other Strategic Considerations

Foreign sourcing is a strategy that domestic and multinational firms can use to compete against low cost suppliers. Tri Valley Growers, a cooperative processor, purchased canned peaches from Chile to supplement its California supplies and compete more effectively in the institutional market against low priced imports from Greece. Del Monte, a multinational processor, followed a similar strategy using contracted purchases from Chile and Argentina. These actions provided access to low cost products without the necessity of direct investment. Kagome, a diversified food firm in Japan, has used the same strategy, buying tomato paste in Turkey and Chile under long term contracts, to help foreclose entry by foreign competitors into the newly liberalized Japanese market for tomato products. The firm is also investing directly in a California processing plant. We don't know why these firms have chosen different strategies but suggest that research is needed to explain the rationale for alternative importing strategies.

A direct foreign investment strategy may involve added investment in infrastructure. This will effect the amount of investment required, the length of the payback period and the risks of the investment. Firms considering a direct investment need to look beyond the costs of building or acquiring production facilities to the need for production research, extension programs, power facilities, transport systems and the financing of growers. Evidence of such needs is provided in the case studies reported by the Agricultural Issues Center of the University of California.

Analysis of Markets

The most important strategic decision implied by the changing structure of the multinational food industry relates to market research. At issue is how firms should plan the research that underlies the strategies discussed by Handy and MacDonald and others.

We reviewed thirty-three empirical studies of trade competition recommended by trade specialists or cited in journal articles that we believe covered a broad spectrum of approaches to trade analysis. There was no consensus in these studies concerning the factors which should be considered in the analysis of competition. This is not surprising. One lesson learned from previous research efforts, (see for examples USDA-ERS, Baldwin and Krugman, and Lindsey) is that large scale projects will not necessarily discover all the factors influencing competitiveness.

We are developing a framework to help analysts in planning foreign market research. The conceptual basis for the framework is from economic theory. The factors included are brought together from sources cited here and in other studies and are grouped according to whether their primary impact is on supply, demand, or the environment within which the market operates. We are improving its organization and clarity prior to reporting the results. The work to date reinforces our belief that some sort of planning guide is needed to help industry members account for the complex factors affecting strategic decisions.

Conclusions

Industry-wide organizations such as marketing orders or trade associations may provide the institutional structure cited by Handy and MacDonald as needed to encourage exporting over direct foreign investment. Research is needed to test this assertion. Firms and industries may be able to accelerate the rate of innovation as a defensive strategy to impede its dispersion and protect existing competitive advantage. Firms considering direct foreign investment as a strategy should evaluate whether the nature of the linkage, either vertical or horizontal, facilitates or impedes the transfer of the parent company's technology.

Foreign sourcing is used as a defensive strategy to protect domestic market shares from foreign competition. Firms could be guided in their decisions about importing versus direct foreign

investment by research into the nature of firms that choose each strategy.

There are a number of strategies that we have not considered and each needs to be compatible with the structural parameters and strategies that we have discussed. The complexity of our planning framework leads us to conclude that the multinational structure of the food industry has complicated the analyst's job. It has certainly placed a premium on thorough market research as a precursor to strategic decisions.

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This material is based in part on work supported by the U.S. Department of Agriculture, Cooperative State Research Service, under Agreement No. 89-34210-04238 and successor(s).

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

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