

# **Processed Food Trade and Foreign Direct Investment Under NAFTA**

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## **Abstract**

Trade in processed food products is rapidly growing. Trade with Canada and Mexico has especially been growing since free trade agreements have been implemented. The U.S. presence in the processed food industry in other countries through foreign direct investment (FDI) is also large and has been expanding. The relationship between trade and FDI is uncertain and subject to much debate. Japan and Canada are the largest importers of processed foods from the United States, followed by Mexico and Korea. Canada is the leading exporter of food products to the United States, followed by France, Mexico, and Italy. Canada and Mexico have, in recent years, become increasingly important trading partners in processed foods.

Results from this study do not conclusively indicate any type of relationship between FDI and trade. Trade in processed foods also appears to be mostly insensitive to the exchange rate. Some of the increase in trade flows can be explained by growth in real GDP. Trade liberalization may also explain the increase in trade flows. Free trade agreements have positively influenced U.S. FDI in Canada and Mexico. Labor cost and inflation in the host country also influences U.S. FDI.

**Key Words:** trade, processed foods, foreign direct investment, Canada, Mexico

## Highlights

In dollar terms, U.S. trade in high-value agricultural products exceeds trade in bulk agricultural commodities. U.S. exports of products classified by the Standard Industrial Classification (SIC) code as food and kindred products increased about 84 percent, from \$15.4 billion in 1989 to \$28.3 billion in 2000, in nominal dollar terms. Imports increased about 88 percent, from \$14.8 billion to \$27.8 billion, during the same period. In 1990 dollars, exports have increased from \$16.2 billion in 1989 to \$21.5 billion in 2000, while imports increased from \$15.6 billion to \$21.1 billion. The United States is a large exporter of meat products, grain mill products, and fats and oils, and a major importer of beverages, meat products, canned or frozen fruits and vegetables, and sugar and confectionary products.

Canada is the largest processed foods trading partner with the United States; Canada sends the most processed foods to the United States and is the second largest destination, behind Japan, for U.S. exports. Processed food imports from Canada increased about 3 times, from \$2.2 billion in 1989 to \$6.7 billion in 2000, while exports to Canada increased about 3.5 times, from \$1.4 billion to \$5.3 billion, during the same period. Trade with Mexico has increased nearly as rapidly. Exports to Mexico increased about 2.5 times, from \$1.3 billion in 1989 to \$3.4 billion in 2000, while imports from Mexico increased about 3.5 times, from \$700 million in 1989 to \$2.5 billion in 2000. The United States is a net importer of processed foods from Canada, a net exporter to Mexico, and a small net exporter of processed foods overall.

Foreign direct investment (FDI) in the processed food industry is a more widely used strategy than exports. Sales by affiliates of U.S. companies in foreign countries has been steadily increasing from \$60 billion in 1988 to \$133 billion in 1998. U.S. FDI has been greatest in the United Kingdom, Canada, Germany, Mexico, and the Netherlands. The majority of FDI in the United States is from European companies.

The results do not conclusively indicate that there is either a complimentary or substitute relationship between FDI and U.S. processed food trade with Canada and Mexico. The exchange rate does not significantly effect imports from Canada or Mexico or exports to Canada. The exchange rate does, however, effect exports to Mexico. Some of the increase in trade flows can be explained by growth in real GDP. Free trade agreements may also explain the increase in processed food trade flows.

Free trade agreements with Canada and Mexico have positively influenced U.S. FDI in these two countries. Labor cost and inflation in the host country also influences U.S. FDI. U.S. firms avoid host countries with high inflation rates, while they try to take advantage of low labor costs. U.S. firms have favored investment in Canada rather than Mexico despite Mexico's low wage rates. In recent years, however, FDI in Mexico has continued to increase while FDI in Canada has leveled off.



# Processed Food Trade and Foreign Direct Investment Under NAFTA

Jeremy W. Mattson and Won W. Koo\*

## Introduction

Trade in processed foods is rapidly growing; trade with Canada and Mexico has especially been growing since the Canada - United States Free Trade Agreement of 1989 (CUSTA) and the North American Free Trade Agreement of 1994 (NAFTA). U.S. presence in the processed food industry in other countries through foreign direct investment (FDI) is also large and has been expanding. The relationship between trade and FDI is uncertain and subject to much debate. As trade and/or FDI in the processed food industry expands, it is important to examine the changes and patterns in trade flows and to understand the causes of these changes.

In dollar terms, U.S. trade in high-value agricultural products exceeds trade in bulk agricultural commodities. Throughout the 1980s, U.S. exports of bulk agricultural commodities were greater than exports of high-value agricultural products. The situation changed in the 1990s; processed food exports increased greatly during the last decade while commodity exports did not change substantially. U.S. exports of products classified by the Standard Industrial Classification (SIC) code as food and kindred products (major group 20) increased about 84 percent, from \$15.4 billion in 1989 to \$28.3 billion in 2000, in nominal dollar terms. Imports increased about 88 percent, from \$14.8 billion to \$27.8 billion, during the same period. Processed food trade has also increased in real terms. In 1990 dollars, exports have increased from \$16.2 billion in 1989 to \$21.5 billion in 2000, while imports increased from \$15.6 billion to \$21.1 billion.

The United States is a large exporter of meat products, grain mill products, and fats and oils, and a major importer of beverages, meat products, canned or frozen fruits and vegetables, and sugar and confectionary products. Canada is the largest processed foods trading partner with the United States; Canada sends the most processed foods to the United States and is the second largest destination, behind Japan, for U.S. exports. Trade with Canada has increased even more rapidly than total trade since the implementation of CUSTA. Processed food imports from Canada increased about 3 times, from \$2.2 billion in 1989 to \$6.7 billion in 2000, while exports to Canada increased about 3.5 times, from \$1.4 billion to \$5.3 billion, during the same period. In 1990 dollars, imports from Canada increased from \$2.3 billion to \$5.1 billion, and exports to Canada increased from \$1.4 billion to \$4.0 billion during the 1989-2000 period.

Trade with Mexico has increased nearly as rapidly. Exports to Mexico increased about 2.5 times, from \$1.3 billion in 1989 to \$3.4 billion in 2000, while imports from Mexico increased about 3.5 times, from \$700 million in 1989 to \$2.5 billion in 2000. In 1990 dollars, exports to Mexico increased from \$1.4 billion to \$2.6 billion, while imports from Mexico increased from \$750 million to \$1.9 billion during the 1989-2000 period. The United States is a net importer of processed foods from Canada, a net exporter to Mexico, and a net exporter of processed foods overall (though the difference between total exports and imports is not that great).

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This study focuses on three issues. First, this study analyzes data for U.S. processed food trade and foreign direct investment (FDI). Processed food imports and exports classified by SIC codes for each country are obtained and analyzed. The major importers and exporters for various processed food products are defined and trends are discussed. Special attention is given to trade patterns with Canada and Mexico. U.S. FDI and FDI in the United States by foreign countries is also discussed. Second, this study identifies factors affecting processed food trade and estimates the effects of these factors on trade with Canada and Mexico. The relationship between exports and FDI is analyzed to attempt to determine if they are compliments or substitutes. Finally, factors affecting U.S. FDI in Canada and Mexico are identified, and the effects of these factors are estimated. Econometric models are developed and estimated.

Many studies have focused on the relationship between trade and FDI in the processed food industry. Foreign direct investment may affect trade flows. A major finding by Onnen (1997) is that U.S. FDI and U.S. processed food exports are complements, rather than substitutes, indicating that foreign direct investment increases trade. The relationship between trade and FDI is a subject of much debate and has been the focus of many studies. In theory, a firm may attempt to penetrate a foreign market by either exporting to the country or by investing and performing the production in the other country. Exports and FDI could, therefore, be viewed as substitutes. International production by firms with U.S. parents has historically been much larger than U.S. processed food exports, indicating that FDI is the preferred strategy (Ning and Reed, 1995).

Banerjee (1997) states that FDI can have significant effects on the host country by stimulating capital formation, competition, innovation, productivity, and savings. These factors can have impacts on the country's import and export activities. One reason for a complimentary relationship is that foreign investments may cause the host country to increase imports of intermediate products. Affiliates often import intermediate inputs from the home country (Banerjee, 1997). Affiliates are business enterprises with foreign investment.

Bolling et al. (1998) state that foreign direct investment has, for the most part, complemented U.S. exports rather than competed with them. They studied U.S. FDI in the Western Hemisphere processed food industry. The data show that both U.S. processed food exports and FDI have increased (Bolling et al., 1998). They state that population and income growth in the Western Hemisphere countries has created an increase in demand for a variety of processed foods. The demand growth has been able to support growth in both affiliate sales and U.S. exports.

Munirathinam et al. (1998) state that if FDI sales have a positive effect on exports there would be indication that FDI and exports are synergistic marketing strategies, while a negative relationship would indicate that they are competing strategies. Their study finds that affiliate sales in Canada are positively related to U.S. exports, which indicates that U.S. exports and U.S. FDI in Canada are synergistic market strategies, rather than competing strategies. Banerjee (1997) also concludes that there is a strong complementary relationship between trade and FDI in Canada. He finds that foreign owned manufacturing affiliates in Canada have higher export and import propensities than do the domestic companies. Munirathinam et al., however, find a substitute relationship between Canadian FDI in the United States and trade. They find that sales from U.S. affiliates of Canadian companies are negatively related to Canadian exports, which indicates that Canadian exports and Canadian investment in the United States are competing market strategies.

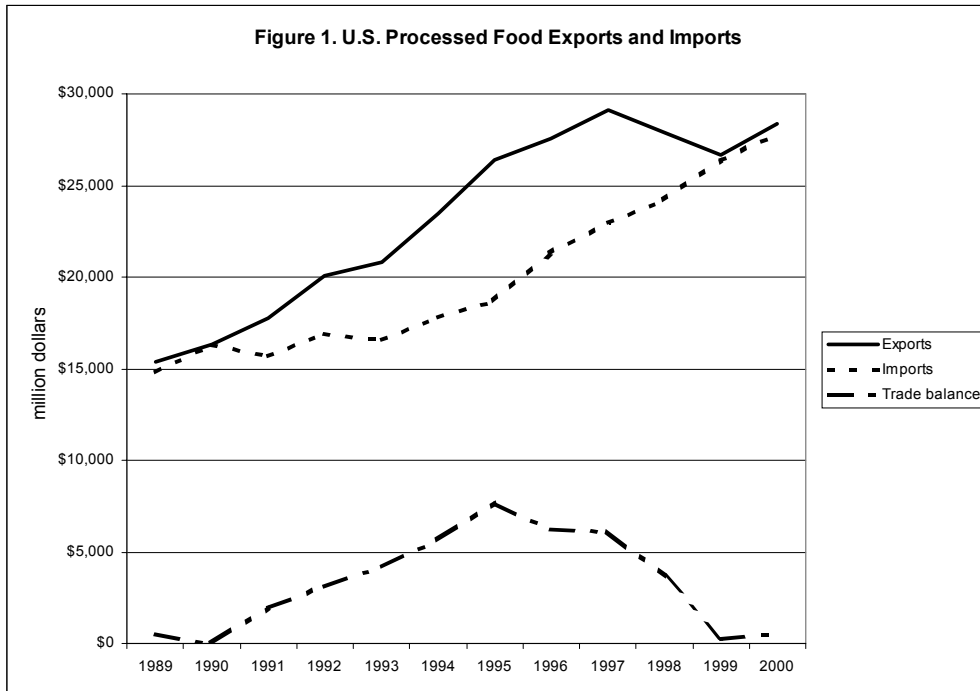
Possible factors that may contribute to a complementary relationship are given by Malanoski et al. (1997). They state that a firm with an increasing presence in a foreign country through FDI may be able to discover opportunities to export products from the home country that are not produced by their affiliates; host country production and marketing staffs and distribution facilities could be used to both find and service export customers in the host country and neighboring countries; U.S. parent companies could exploit trade opportunities with their affiliates. Malanoski et al. (1997) also state reasons that may contribute to a substitute relationship. Companies may find it is more cost effective to build plants in the foreign country instead of exporting; exports would be replaced with local production. Also, the desire to maximize control over marketing and distribution may lead food companies to prefer FDI over exports. Malanoski et al. find that exports may serve as a precursor to FDI, but they find no strong support for either a complement or substitute relationship between FDI and exports. They conclude that the trade-FDI relationship differs depending on the level of economic development in the host country.

A number of studies have examined other factors that affect processed food trade and FDI. Onnen (1997) finds that trade agreements have positive effects on U.S. exports. Munirathinam et al. (1998) also find that CUSTA has a positive effect on U.S. exports to Canada. Onnen finds that developed countries import more processed food products from the United States. Her study could not determine the relationship between U.S. export levels and exchange rates. Somwaru and Bolling (1999), on the other hand, find that the exchange rate, along with U.S. export prices, have the expected negative relationships with U.S. exports. Munirathinam et al. find that Canadian income has a positive effect on U.S. exports to Canada for a number of processed food products, and export price has a negative effect.

Munirathinam et al. also find that CUSTA seems to have stimulated U.S. investment in Canada. Onnen finds that exchange rate variation, foreign agricultural production, transportation costs, foreign income levels, and geographical regions all affect U.S. FDI levels. Ning and Reed (1995) find that cultural linkages, trading blocs, host market size, tax considerations, exchange rate differentials, and growth rates are the significant determinants of FDI in food and kindred products. Their results do not support the theory that wage differentials are a significant determinant of FDI. They find that food processors invest in stable economies that provide growth potential for their output and that their major motivation is not to escape high wage rates in the United States.

### **Processed Food Trade**

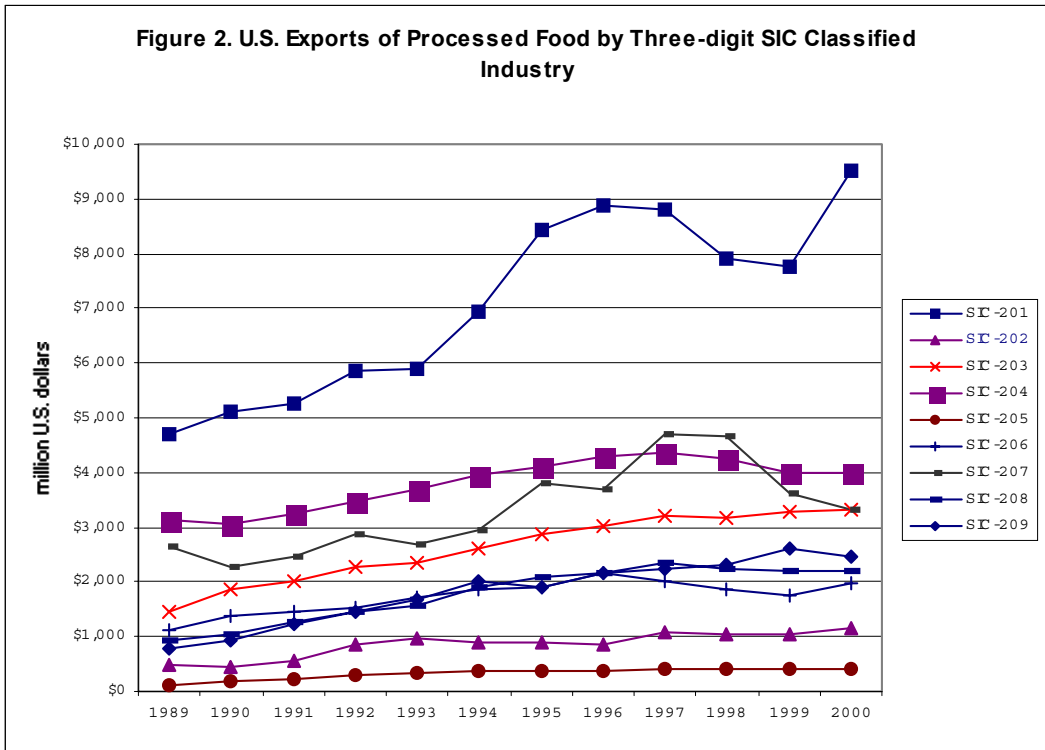
Imports and exports have both been increasing fairly rapidly since 1989. Exports had been increasing at a faster pace until 1995, which was resulting in an increasing trade surplus. Since 1995, exports have leveled off while imports started to increase at a faster rate causing the trade surplus to nearly disappear. Figure 1 shows trade for products categorized under the SIC-20 classification; these data can be segregated in nine 3-digit classes (SIC 201-209) as shown in Table 1. Imports and exports of products in each of these classes have mostly increased since 1989, though U.S. exports have leveled off since 1995 (Figures 2 & 3). The United States is a large exporter of meat products, grain mill products, and fats and oils, and a major importer of beverages, meat products, canned or frozen fruits and vegetables, and sugar and confectionary products. Figures 4 and 5 show the export and import shares for each product class and how these shares have changed over time.



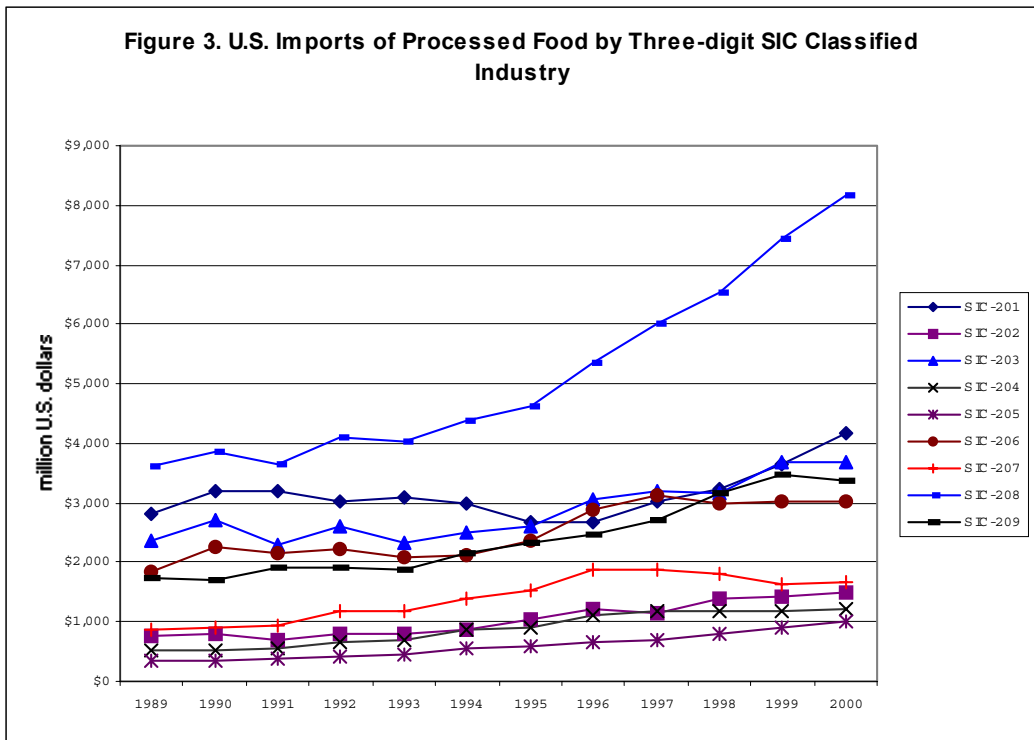
Source: U.S. International Trade Commission

Table 1. Standard Industrial Classification (SIC) codes and product descriptions

SIC Code	Product Description
20	Food and kindred products
201	Meat products
202	Dairy products
203	Canned, frozen, and preserved fruits and vegetables
204	Grain mill products
205	Bakery products
206	Sugar and confectionary products
207	Fats and oils
208	Beverages
209	Miscellaneous

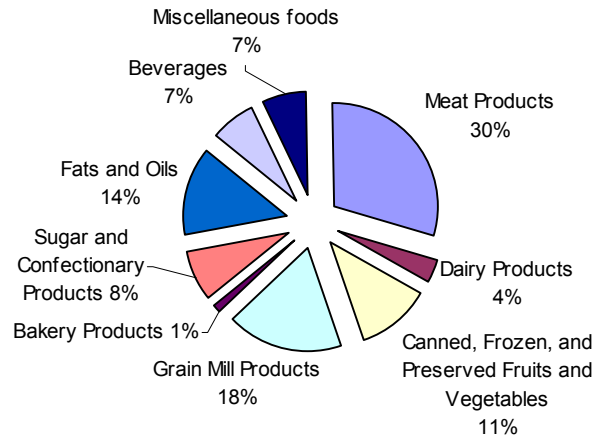


Source: U.S. International Trade Commission.



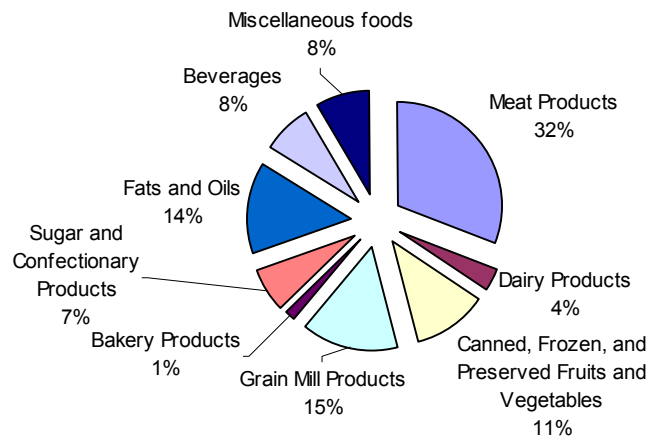
Source: U.S. International Trade Commission.

**Figure 4a. U.S. Processed Food Exports by Classification, 1989-1994**



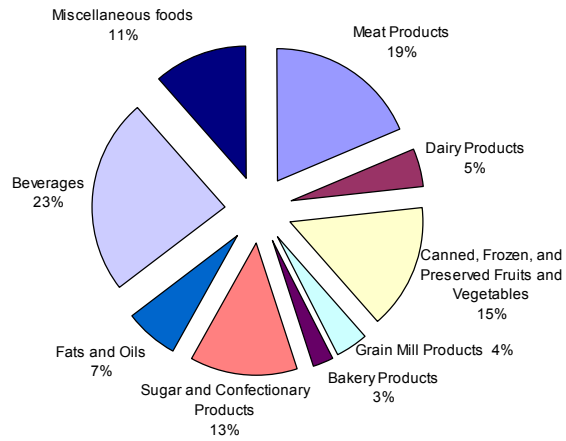
Source: U.S. International Trade Commission

**Figure 4b. U.S. Processed Food Exports by Classification, 1995-2000**



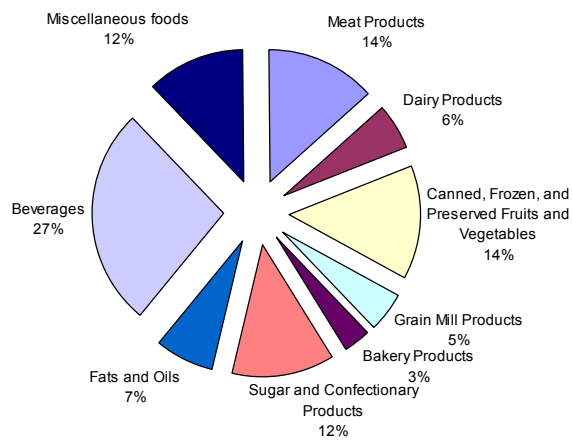
Source: U.S. International Trade Commission

**Figure 5a. U.S. Processed Food Imports by Classification, 1989-1994**



Source: U.S. International Trade Commission

**Figure 5b. U.S. Processed Food Imports by Classification, 1995-2000**



Source: U.S. International Trade Commission

Japan and Canada are the largest importers of processed foods from the United States (Table 2). Japan's import share of U.S. exports during the 1989-2000 period was 19.8 percent and Canada's was 16.4 percent. Canada's import share has been slightly higher in recent years, but overall the import shares of Japan and Canada have not varied significantly during this time period. Mexico and Korea are the next largest importers of U.S. food products with import shares of 9.1 and 5.2 percent, respectively.

Table 2a. U.S. exports of processed food products to major importing countries, average from 1989-1994

Country	Average Annual Exports, U.S. Dollars	% Import Share	% Cumulative Import Share
<u>SIC-20</u>			
Japan	3,946,015,129	20.8%	20.8%
Canada	2,900,996,396	15.3%	36.1%
Mexico	1,723,328,695	9.1%	45.2%
Korea	1,069,412,165	5.6%	50.8%
Netherlands	775,920,704	4.1%	54.9%
Former Soviet Union	626,166,645	3.3%	58.2%
United Kingdom	523,880,767	2.8%	61.0%
Taiwan	458,813,289	2.4%	63.4%
Hong Kong	457,670,339	2.4%	65.8%
Germany	453,698,500	2.4%	68.2%

Table 2b. U.S. exports of processed food products to major importing countries, average from 1995-2000

Country	Average Annual Exports, U.S. Dollars	% Import Share	% Cumulative Import Share
<u>SIC-20</u>			
Japan	5,295,044,420	19.1%	19.1%
Canada	4,760,631,495	17.2%	36.4%
Mexico	2,525,133,619	9.1%	45.5%
Korea	1,351,653,546	4.9%	50.4%
Hong Kong	1,027,692,187	3.7%	54.1%
Russia	872,867,017	3.2%	57.2%
Netherlands	781,571,832	2.8%	60.1%
United Kingdom	780,889,464	2.8%	62.9%
Taiwan	704,228,707	2.5%	65.4%
China	570,315,594	2.1%	67.5%



Canada is the leading exporter of food products to the United States (Table 3). Canada's export share of U.S. imports increased continually from 14.6 percent in 1989 to 24.1 percent in 2000 and averaged 20.1 percent during this period. The next largest exporters of food products to the United States were France, Mexico, and Italy, with export shares of 7.0, 6.7, and 5.4 percent, respectively. Mexico's export share has increased slightly in recent years; Mexico is now the second largest exporter of processed food products to the United States.

Table 3a. U.S. imports of processed food products from major exporting countries, average from 1989-1994

Country	Average Annual Imports, U.S. Dollars	% Export Share	% Cumulative Export Share
<u>SIC-20</u>			
Canada	2,779,013,408	17.0%	17.0%
France	1,081,135,182	6.6%	23.6%
Australia	952,970,820	5.8%	29.4%
Mexico	856,482,349	5.2%	34.6%
Brazil	834,832,774	5.1%	39.7%
Italy	806,941,852	4.9%	44.7%
United Kingdom	803,766,286	4.9%	49.6%
New Zealand	688,510,278	4.2%	53.8%
Thailand	668,693,151	4.1%	57.9%
Netherlands	588,521,351	3.6%	61.5%

Table 3b. U.S. imports of processed food products from major exporting countries, average from 1995-2000

Country	Average Annual Imports, U.S. Dollars	% Export Share	% Cumulative Export Share
<u>SIC-20</u>			
Canada	5,385,021,275	22.8%	22.8%
Mexico	1,803,971,107	7.7%	30.5%
France	1,714,102,329	7.3%	37.8%
Italy	1,363,084,508	5.8%	43.5%
United Kingdom	1,085,465,391	4.6%	48.1%
Netherlands	937,783,020	4.0%	52.1%
Australia	906,661,269	3.8%	56.0%
New Zealand	771,898,843	3.3%	59.2%
Thailand	701,885,488	3.0%	62.2%
Brazil	701,015,508	3.0%	65.2%

The following section contains a description of U.S. processed goods trade using the three-digit SIC code classifications 201-209. Data were obtained from the United States International Trade Commission (USITC) Trade DataWeb on the Internet. Tables 4 and 5 show the major exporters and importers in each category. These tables show that the major trading partners for the 1989-1994 period and the 1995-2000 period were similar, yet slightly different. In this analysis, export share for a country is defined as that country's exports to the United States as a percent of the United States' total imports. Import share for a country is defined as that country's total imports from the United States as a percent of the United States' total exports.

### *SIC 201 - Meat Products*

The United States is a net exporter of meat products. The trade surplus for meat products has grown from \$1.9 billion in 1989 to \$5.3 billion in 2000. Exports grew from \$4.7 billion dollars in 1989 to \$9.5 billion in 2000, while imports grew from \$2.8 billion to \$3.8 billion during that same time period.

The largest importers of U.S. meat products are Japan, Korea, and Mexico. During the 1989-2000 period, 36 percent of U.S. meat product exports were shipped to Japan, 12.1 percent and 11.9 percent were shipped to Korea and Mexico, respectively. The next largest importers were Canada, Russia, and Hong Kong. Japan has consistently been the biggest importer of U.S. meat products. Nominal dollar value exports to Japan increased slightly during this period, but its import share of U.S. exports dropped from 44 percent in 1989 to 32 percent in 2000. In general, the United States is exporting meat products to the same countries as it has been over the last several years, with Japan being the major importer.

Most of the U.S. meat product imports come from Canada, Australia, New Zealand, Denmark, and Argentina. Canada is the largest exporter of meat products to the United States. During the 1989-2000 period, 34 percent of all U.S. meat product imports came from Canada, 21 percent were from Australia, and 15.5 percent were from New Zealand. From 1989 to 1992, Australia was the largest exporter of meat products to the United States, with Canada second. Since then, Canada has consistently been the largest and Australia has been second; New Zealand has consistently been third. Canada's export share of U.S. imports increased significantly from 21.1 percent in 1991 to 45.8 percent in 2000. Australia's export share decreased from 27.8 percent in 1992 to 13.6 percent in 1996, but then increased to 19.8 percent in 2000. The United States is a net importer of meat products from Canada, but a net exporter overall. The trade deficit with Canada for meat products has been growing, while the overall trade surplus grew in the early 1990s and has remained stable.

Table 4a. U.S. exports of processed food products by classification to major importing countries, average from 1989-1994

Country	Average Annual Exports, U.S. Dollars	% Import Share	% Cumulative Import Share
<b>SIC-201</b>			
Japan	2,214,164,083	39.4%	39.4%
Korea	817,208,288	14.5%	53.9%
Mexico	687,715,294	12.2%	66.2%
Canada	608,576,001	10.8%	77.0%
Hong Kong	194,942,462	3.5%	80.5%
<b>SIC-202</b>			
Mexico	165,067,051	23.5%	23.5%
Former Soviet Union	68,565,108	9.8%	33.2%
Canada	56,746,425	8.1%	41.3%
Japan	53,299,971	7.6%	48.9%
Taiwan	48,308,329	6.9%	55.8%
<b>SIC-203</b>			
Canada	546,422,676	26.2%	26.2%
Japan	479,020,539	22.9%	49.1%
United Kingdom	99,436,889	4.8%	53.9%
Germany	83,773,560	4.0%	57.9%
Netherlands	81,412,344	3.9%	61.8%
<b>SIC-204</b>			
Canada	439,987,118	12.8%	12.8%
Netherlands	425,135,293	12.4%	25.2%
Japan	358,618,794	10.5%	35.7%
Mexico	214,520,187	6.3%	41.9%
Saudi Arabia	138,688,018	4.0%	46.0%
<b>SIC-205</b>			
Canada	137,918,393	54.3%	54.3%
Mexico	23,690,661	9.3%	63.6%
Bermuda	18,116,730	7.1%	70.8%
Japan	10,651,496	4.2%	75.0%
United Kingdom	7,280,124	2.9%	77.8%
<b>SIC-206</b>			
Canada	300,823,657	20.0%	20.0%
Japan	196,820,734	13.1%	33.1%
Germany	160,790,860	10.7%	43.8%
Mexico	132,637,601	8.8%	52.6%
Netherlands	75,511,837	5.0%	57.6%
<b>SIC-207</b>			
Former Soviet Union	338,887,992	12.8%	12.8%
Canada	253,771,400	9.6%	22.3%
Mexico	242,241,840	9.1%	31.5%
Algeria	143,397,008	5.4%	36.9%
Japan	130,622,844	4.9%	41.8%
<b>SIC-208</b>			
Japan	299,669,445	22.1%	22.1%
Canada	167,500,145	12.3%	34.4%
Mexico	115,455,870	8.5%	42.9%
Australia	95,144,384	7.0%	49.9%
United Kingdom	69,678,891	5.1%	55.1%
<b>SIC-209</b>			
Canada	389,250,581	28.7%	28.7%
Japan	203,147,225	15.0%	43.7%
United Kingdom	99,270,999	7.3%	51.1%
Hong Kong	66,082,932	4.9%	56.0%
Mexico	60,821,002	4.5%	60.4%

Table 4b. U.S. exports of processed food products by classification to major importing countries, average from 1995-2000

Country	Average Annual Exports, U.S. Dollars	% Import Share	% Cumulative Import Share
<b>SIC-201</b>			
Japan	2,913,395,474	34.1%	34.1%
Mexico	993,900,943	11.6%	45.7%
Korea	895,085,601	10.5%	56.2%
Canada	793,777,391	9.3%	65.5%
Russia	730,447,978	8.5%	74.0%
<b>SIC-202</b>			
Mexico	167,685,102	16.7%	16.7%
Canada	152,196,262	15.2%	31.9%
Japan	109,789,307	10.9%	42.8%
Taiwan	63,013,077	6.3%	49.1%
Hong Kong	48,332,079	4.8%	53.9%
<b>SIC-203</b>			
Canada	863,927,100	27.5%	27.5%
Japan	693,400,616	22.1%	49.6%
Mexico	179,087,662	5.7%	55.3%
United Kingdom	133,748,437	4.3%	59.5%
Netherlands	118,753,860	3.8%	63.3%
<b>SIC-204</b>			
Canada	735,551,611	17.7%	17.7%
Japan	522,152,110	12.6%	30.2%
Mexico	346,693,898	8.3%	38.6%
Netherlands	296,893,880	7.1%	45.7%
United Kingdom	163,825,199	3.9%	49.7%
<b>SIC-205</b>			
Canada	247,376,836	61.5%	61.5%
Mexico	24,332,717	6.0%	67.5%
Japan	16,776,276	4.2%	71.7%
United Kingdom	15,762,993	3.9%	75.6%
Bermuda	13,801,622	3.4%	79.0%
<b>SIC-206</b>			
Canada	457,344,052	23.4%	23.4%
Japan	216,658,032	11.1%	34.5%
Germany	182,060,419	9.3%	43.9%
Mexico	127,686,563	6.5%	50.4%
Spain	100,909,141	5.2%	55.6%
<b>SIC-207</b>			
Mexico	436,300,128	11.0%	11.0%
Canada	412,936,001	10.4%	21.4%
China	280,566,383	7.1%	28.5%
Japan	206,829,147	5.2%	33.7%
Philippines	174,421,210	4.4%	38.1%
<b>SIC-208</b>			
Japan	335,677,027	15.2%	15.2%
Canada	334,306,986	15.1%	30.3%
United Kingdom	195,018,990	8.8%	39.1%
Mexico	124,136,022	5.6%	44.7%
Germany	86,178,093	3.9%	48.6%
<b>SIC-209</b>			
Canada	763,215,258	33.5%	33.5%
Japan	280,366,432	12.3%	45.8%
Mexico	125,310,584	5.5%	51.3%
United Kingdom	110,024,335	4.8%	56.2%
Hong Kong	105,306,436	4.6%	60.8%

Table 5a. U.S. imports of processed food products by classification from major exporting countries, average from 1989-1994

Country	Average Annual Imports, U.S. Dollars	% Export Share	% Cumulative Export Share
<b>SIC-201</b>			
Australia	768,235,001	25.2%	25.2%
Canada	753,611,031	24.7%	50.0%
New Zealand	536,047,131	17.6%	67.6%
Denmark	259,926,071	8.5%	76.1%
Argentina	155,800,393	5.1%	81.2%
<b>SIC-202</b>			
New Zealand	137,285,260	17.5%	17.5%
Ireland	131,119,980	16.7%	34.2%
Italy	97,780,500	12.4%	46.6%
France	71,865,459	9.1%	55.8%
Denmark	43,590,932	5.5%	61.3%
<b>SIC-203</b>			
Brazil	385,388,711	15.6%	15.6%
Mexico	321,298,472	13.0%	28.6%
Spain	233,916,640	9.5%	38.0%
Thailand	199,530,803	8.1%	46.1%
Canada	142,769,053	5.8%	51.9%
<b>SIC-204</b>			
Canada	308,269,117	48.2%	48.2%
Thailand	106,077,456	16.6%	64.8%
Germany	48,535,393	7.6%	72.4%
Netherlands	33,884,970	5.3%	77.7%
Australia	26,860,995	4.2%	82.0%
<b>SIC-205</b>			
Canada	163,124,028	39.3%	39.3%
Denmark	48,218,458	11.6%	50.9%
Mexico	27,378,539	6.6%	57.5%
United Kingdom	22,798,247	5.5%	63.0%
Germany	21,969,473	5.3%	68.3%
<b>SIC-206</b>			
Brazil	301,155,923	14.2%	14.2%
Canada	218,892,014	10.3%	24.6%
India	128,120,061	6.1%	30.6%
Dominican Rep	122,831,062	5.8%	36.4%
Philippines	120,103,516	5.7%	42.1%
<b>SIC-207</b>			
Canada	259,597,242	24.1%	24.1%
Italy	168,082,928	15.6%	39.8%
Philippines	165,137,636	15.4%	55.1%
Malaysia	111,548,952	10.4%	65.5%
Mexico	36,066,194	3.4%	68.8%
<b>SIC-208</b>			
France	900,737,212	22.9%	22.9%
United Kingdom	652,380,557	16.6%	39.4%
Canada	605,209,320	15.4%	54.8%
Italy	353,115,526	9.0%	63.8%
Netherlands	349,236,038	8.9%	72.7%
<b>SIC-209</b>			
Thailand	326,773,435	17.4%	17.4%
Canada	303,219,848	16.1%	33.5%
Italy	102,527,354	5.4%	38.9%
Mexico	91,035,652	4.8%	43.7%
Indonesia	88,090,086	4.7%	48.4%

Table 5b. U.S. imports of processed food products by classification from major exporting countries, average from 1995-2000

Country	Average Annual Imports, U.S. Dollars	% Export Share	% Cumulative Export Share
<b>SIC-201</b>			
Canada	1,384,564,804	42.7%	42.7%
Australia	552,840,182	17.0%	59.8%
New Zealand	439,911,987	13.6%	73.3%
Denmark	194,464,678	6.0%	79.3%
Argentina	131,864,951	4.1%	83.4%
<b>SIC-202</b>			
New Zealand	281,757,660	21.8%	21.8%
Ireland	144,993,151	11.2%	33.0%
Italy	142,402,235	11.0%	44.0%
France	127,304,163	9.8%	53.8%
Canada	77,450,215	6.0%	59.8%
<b>SIC-203</b>			
Canada	517,622,992	16.0%	16.0%
Mexico	467,140,311	14.5%	30.5%
Spain	264,767,555	8.2%	38.7%
Thailand	194,037,904	6.0%	44.7%
Brazil	193,868,755	6.0%	50.7%
<b>SIC-204</b>			
Canada	601,950,801	53.1%	53.1%
Thailand	157,922,448	13.9%	67.0%
Germany	70,636,742	6.2%	73.2%
Netherlands	47,875,715	4.2%	77.5%
India	37,090,253	3.3%	80.7%
<b>SIC-205</b>			
Canada	339,534,747	43.5%	43.5%
Mexico	82,307,964	10.5%	54.0%
Denmark	47,187,428	6.0%	60.0%
Belgium	37,098,737	4.7%	64.8%
Italy	37,006,956	4.7%	69.5%
<b>SIC-206</b>			
Canada	471,177,094	16.2%	16.2%
Brazil	284,573,967	9.8%	26.0%
Mexico	198,387,856	6.8%	32.9%
India	197,390,475	6.8%	39.7%
United Kingdom	145,465,317	5.0%	44.7%
<b>SIC-207</b>			
Canada	564,601,678	32.7%	32.7%
Italy	288,152,912	16.7%	49.3%
Philippines	256,244,518	14.8%	64.2%
Malaysia	131,726,810	7.6%	71.8%
Indonesia	77,652,495	4.5%	76.3%
<b>SIC-208</b>			
France	1,422,872,537	22.4%	22.4%
United Kingdom	792,582,255	12.5%	34.9%
Canada	782,760,683	12.3%	47.2%
Mexico	771,653,538	12.2%	59.4%
Netherlands	607,903,422	9.6%	69.0%
<b>SIC-209</b>			
Canada	645,358,262	22.1%	22.1%
Thailand	279,448,014	9.6%	31.7%
Italy	195,513,276	6.7%	38.4%
India	166,730,345	5.7%	44.1%
Indonesia	161,006,047	5.5%	49.6%

### SIC 202 - Dairy Products

The United States is a net importer of dairy products. The annual trade deficit has averaged \$187 million dollars during the 1989-2000 period. The trade balance has varied from a surplus of \$180 million in 1993 to a deficit of \$405 million in 1999. U.S. exports have increased from \$449 million in 1989 to \$1.15 billion in 2000, while imports have increased from \$751 million to \$1.51 billion over the same time period.

The largest importers of U.S. dairy products are Mexico, Canada, Japan, Taiwan, and India. Mexico is the largest importer of U.S. dairy products with an average import share of U.S. exports of 19.5 percent during the 1989-2000 period; Canada and Japan, during the same time period, had import shares of 12.2 and 9.6 percent, respectively. Canada's import share increased from 4.0 percent in 1989 to 18.7 percent in 2000. U.S. exports to Canada have been increasing, while exports to Mexico and Japan have remained somewhat constant.

The largest exporters of dairy products to the United States are New Zealand, Ireland, Italy, France, and the Netherlands. Of all U.S. dairy product imports from 1989 to 2000, 20.1 percent were from New Zealand; 13.3 and 11.5 percent were from Ireland and Italy, respectively.

### SIC 203 - Canned, Frozen, and Preserved Fruits and Vegetables

The United States is a net importer of canned, frozen, and preserved fruits and vegetables. In some years, though, the United States has been a net exporter. The trade deficit averaged \$237 million dollars per year during the 1989-2000 period. The trade balance has varied from a trade deficit of \$916 million in 1989 to a surplus of \$275 million in 1995. The total value of canned, frozen, and preserved fruit and vegetable exports has increased in almost every year since 1989. Exports increased from \$1.44 billion in 1989 to \$3.32 billion, and imports increased from \$2.36 billion to \$3.67 billion during the same period.

Nearly half of all U.S. exports of canned, frozen, and preserved fruits and vegetables are sent to Canada and Japan. Canada's import share of U.S. exports during the 1989-2000 period was 27.0 percent and Japan's was 22.4 percent. These import shares have been fairly constant since 1990. The next largest importers are Mexico, the United Kingdom, and the Netherlands with import shares of 5.0, 4.5, and 3.8 percent, respectively, during this time period.

Mexico, Canada, Brazil, Spain, and Thailand are the largest exporters of canned, frozen, and preserved fruits and vegetables to the United States with export shares of 13.8, 11.6, 10.2, 8.7, and 6.9 percent, respectively, during the 1989-2000 period. Brazil's export share of U.S. imports has decreased significantly during the 1990s, while Canada's has increased. Brazil's export share decreased from 28.2 percent in 1990 to 5.3 percent in 2000; Canada's export share has increased consistently from 4.3 percent to 21.2 percent during the same period, which now makes Canada the largest exporter to the United States. The change may be due mainly to the U.S.-Canada free trade agreement. Mexico's export share has remained fairly constant.

### SIC 204 - Grain Mill Products

The United States has a trade surplus in grain mill products. This trade surplus has remained fairly constant during the 1990s, averaging \$2.9 billion. Grain mill products include flour, cereal breakfast foods, rice milling products, prepared flour mixes and doughs, wet corn milling products, dog and cat food, and prepared feeds and feed ingredients for animals and fowls.

Canada, Japan, the Netherlands, and Mexico are the largest importers of U.S. grain mill products. The United States sent 15.5 percent of all grain mill exports to Canada during the 1989-2000 period; Japan, the Netherlands, and Mexico had import shares of U.S. exports of 11.6, 9.5, and 7.4 percent, respectively, during the same period. The import shares for Canada and Mexico have been gradually increasing, while the Netherlands' import share has been decreasing. This change may be due mainly to the free trade agreements with Canada and Mexico.

Over half of all U.S. grain mill product imports are from Canada. Canada's export share of U.S. imports during the 1989-2000 period was 51.3 percent. The next largest exporter of grain mill products to the United States was Thailand with an export share of 14.9 percent. Germany, the Netherlands, and Australia were the next largest exporters. Canada's dominant export share increased from 45.3 percent in 1989 to 54.5 percent in 1996, but then fell slightly to 51.7 percent in 2000.

### SIC 205 - Bakery Products

The United States is a net importer of bakery products. The average annual trade deficit during the 1989-2000 period was \$270 million. Total bakery product exports increased from \$110 million in 1989 to \$418 million in 2000, while imports increased from \$343 million to \$1.02 billion. The trade deficit increased during the late 1990s to \$598 million in 2000.

Canada is the United States' major trading partner for bakery products. Canada's dominate role in U.S. bakery product trade may be due to the their proximity to the United States and the perishable nature of bakery products. During the 1989-2000 period, 58.7 percent of all U.S. bakery product exports were sent to Canada. Canada's import share of U.S. exports has increased during recent years to 65.4 percent in 2000. Mexico is the second largest importer of U.S. bakery products with an import share of 7.3 percent during the 1989-2000 period.

Even though a majority of U.S. bakery product exports are sent to Canada, the United States is still a net importer of bakery products from Canada. Canada's export share of U.S. imports during the 1989-2000 period was 42.0 percent. Mexico and Denmark were the next largest exporters of bakery products to the United States, with export shares of 9.2 and 8.0 percent, respectively. Canada and Mexico's export shares increased in the early 1990s and then remained fairly constant; Denmark's export share has been decreasing.

### SIC 206 - Sugar and Confectionary Products

The United States has a trade deficit for sugar and confectionary products. The annual trade deficit during the 1989-2000 period averaged \$782 million and has been slightly over \$1 billion during the last four years.

Canada, Japan, Germany, and Mexico are the major importers of U.S. sugar and confectionary products. Canada is the leading importer of chocolate and cocoa products and candy and other confectionary products from the United States; Japan is the leading importer of cane sugar and chewing gum from the United States; and Germany is the leading importer of salted and roasted nuts and seeds. Canada's import share of U.S. exports during the 1989-2000 period was 21.9 percent. Japan, Germany, and Mexico had import shares of 12.0, 9.9, and 7.5 percent, respectively. Canada's import share has been somewhat higher in recent years, it was 25.7 percent in 2000; Japan's import share has declined slightly during the 1990s; Mexico's import share rebounded from a low in the mid-1990s to 13 percent in 2000; Germany's import share remained fairly constant through most of the 1990s, but has fallen the last two years.

Canada and Brazil are the leading exporters of sugar and confectionary products to the United States. Canada's export share of U.S. imports during the 1989-2000 period was 13.8 percent, while Brazil's export share was 11.7 percent. The next largest exporters were India, Mexico, and the Dominican Republic with export shares ranging from 6.5 to 5.0 percent. The Dominican Republic exports mostly cane sugar, Brazil exports cane sugar and salted and roasted nuts and seeds. India is the largest exporter of salted and roasted nuts and seeds to the United States, while Canada is the largest exporter of chocolate and cocoa products and candy and other confectionary products to the United States. Canada's export share has increased consistently from 7.4 percent in 1989 to 20.2 percent in 2000, while Brazil's export share has declined slightly.

### SIC 207 - Fats and Oils

The United States is a net exporter of fats and oils. The average annual trade surplus during the 1989-2000 period for fats and oils was \$1.9 billion. Exports increased from \$2.67 billion in 1989 to \$4.69 billion in 1997, and then decreased to \$3.32 billion in 2000. Imports increased from \$846 million in 1989 to \$1.88 billion in 1997, and then decreased to \$1.67 billion in 2000.

Mexico, Canada, the former Soviet Union, Japan, and China are the leading importers of U.S. fats and oils. Mexico and Canada had import shares of U.S. exports of 10.3 percent and 10.1 percent, respectively, during the 1989-2000 period. The former Soviet Union, Japan, and China had import shares ranging between 5.9 and 4.7 percent. From 1989-1991, the Soviet Union was the major destination of U.S. fats and oils exports. The Soviet Union had an average export share of 17.9 percent during this period. Exports to the former Soviet republics dropped considerably after 1991. Since then, Mexico and Canada have consistently been the top two importers of U.S. fats and oils, with the exception of 1995 when a significant share was sent to China. In 1999 and 2000, Switzerland and the Philippines were the third and fourth largest importers, respectively.

The major exporters of fats and oils to the United States are Canada, Italy, the Philippines, and Malaysia. Canada's export share of U.S. imports during the 1989-2000 period was 29.4 percent. Canada's export share increased during the mid-1990s and averaged 32.7 percent during the 1995-2000 period. Italy, the Philippines, and Malaysia had export shares of 16.3, 15.0, and 8.7 percent, respectively, during the 1989-2000 period.

### SIC 208 - Beverages

The United States is a major net importer of beverages. Beverages in this category include malt beverages; malt; wines, brandy, and brandy spirits; distilled and blended liquors; bottled and canned soft drinks and carbonated waters; and flavoring extracts and flavoring syrups not classified elsewhere. The U.S. annual beverage trade deficit averaged \$3.36 billion during the 1989-2000 period and was \$5.94 billion in 2000. U.S. beverage exports increased from \$928 million in 1989 to \$2.21 billion in 2000, while imports increased from \$3.63 billion in 1989 to \$8.15 billion in 2000.

Japan and Canada are major destinations for U.S. beverage exports. Japan had been the leading importer of U.S. beverages until recent years when U.S. exports to Canada increased and surpassed exports to Japan. Japan's import share of U.S. exports decreased from 29.8 percent in 1989 to 11.4 percent in 2000, and averaged 17.8 percent during this period. Canada's import share averaged 14.1 percent during this period, but has been greater than Japan's since 1998. Canada's import share of U.S. exports in 2000 was 19.0 percent. The next largest importers of U.S. beverages are the United Kingdom, Mexico, and Australia. The United Kingdom's import share averaged 7.4 percent during the 1989-2000 period, but has averaged about 10 percent since 1998. The leading destinations for U.S. malt beverages are Canada, Mexico, Ireland, and Japan. Malt beverage exports to Japan, Hong Kong, Brazil, and Taiwan have decreased substantially in recent years. The United States exports malt mainly to Mexico, and also Japan. The United Kingdom, Canada, the Netherlands, and Japan are the leading destinations for U.S. exports of wines, brandy, and brandy spirits; Japan, Canada, Germany and Mexico are the major destinations for distilled and blended liquors; and Canada, Japan, and Mexico are the leading destinations for bottled and canned soft drinks and carbonated waters.

France is the leading exporter of beverages to the United States. France's export share of U.S. imports during the 1989-2000 period averaged 22.6 percent and did not vary significantly. The United Kingdom, Canada, Mexico, the Netherlands, and Italy are the next largest exporters to the United States with export shares during the 1989-2000 period of 14.1, 13.5, 10.1, 9.3, and 8.9 percent respectively. Mexico has become a larger exporter of beverages to the United States in recent years; Mexico's export share was 15.7 percent in 2000. Of the beverage categories, the largest percentage of imports for the United States are wines, brandy, and brandy spirits; distilled and blended liquors is second and malt beverages third. About half of the wines, brandy, and brandy spirit imports are from France; the United States also imports a significant amount from Italy, Australia, Chile, and Spain. Mexico and the Netherlands are large exporters of malt beverage to the United States, and malt is imported from Canada. Distilled and blended liquors are imported mostly from the United Kingdom, Canada, Mexico, Sweden, France, and Ireland, in that order.



### SIC 209 - Miscellaneous Food Preparations and Kindred Products

The United States has a trade deficit in miscellaneous food preparations and kindred products. Products in this category include canned and cured fish and seafoods; prepared fresh or frozen fish and seafoods; roasted coffee; potato chips, corn chips, and similar snacks; manufactured ice; macaroni, spaghetti, vermicelli, and noodles; and food preparations not classified elsewhere. The U.S. annual trade deficit for these miscellaneous products averaged \$584 million during the 1989-2000 period. Exports increased from \$800 million in 1989 to \$2.47 billion in 2000. Imports increased from \$1.73 billion to \$3.38 billion during the same period.

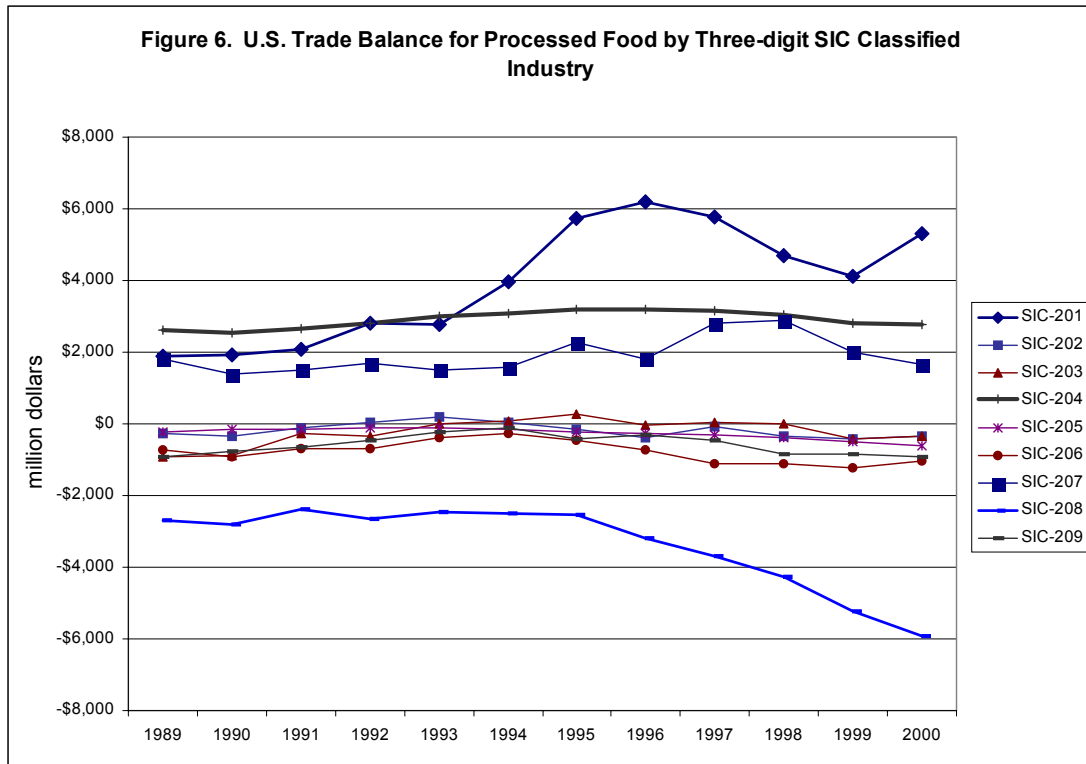
Canada and Japan are the major importers of miscellaneous products from the United States. Canada's import share of U.S. exports during the 1989-2000 period was 31.7 percent and Japan's import share was 13.3 percent. The United Kingdom, Mexico, and Hong Kong were the next largest importers with import shares ranging from 4.7 percent to 5.8 percent.

The leading exporters of miscellaneous products to the United States are Canada and Thailand. Thailand is the largest exporter of canned and cured fish and seafoods to the United States. Canada and Thailand had export shares of U.S. imports of 19.8 and 12.6 percent, respectively, during the 1989-2000 period. Thailand was the leading exporter until 1993; Canada's export share has been increasing since the early 1990s, while Thailand's has been decreasing. Canada's export share in 2000 was 25.4 percent, while Thailand's was the second highest at 8.3 percent. The next largest exporters to the United States have been Italy, Indonesia, Mexico, and India. Italy is the largest exporter of macaroni, spaghetti, vermicelli, and noodles to the United States.

### Trade Balance

The United States is a net importer in six of the nine categories (dairy products; canned, frozen, and preserved fruits and vegetables; bakery products; sugar and confectionary products; beverages; and miscellaneous products) and a net exporter in three categories (meat products, grain mill products, and fats and oils) (Figure 6). Despite being a net importer in more categories, the United States is a net exporter overall. The trade surpluses in meat products, grain mill products, and fats and oils is large, while the trade deficits in most of the other categories are relatively smaller. The exception is the large trade deficit in beverages.

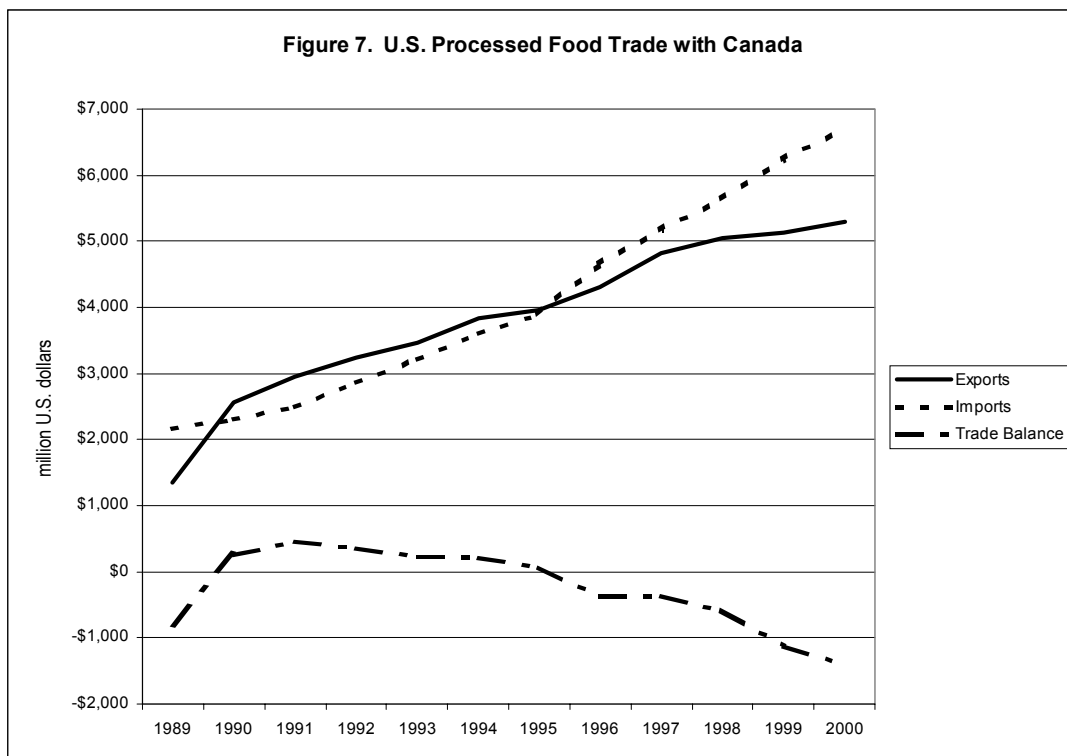
The U.S. trade surplus in SIC-20 products averaged \$3.34 billion during the 1989-2000 period. In 1990 there was a trade deficit, but in each following year there was a surplus that increased to \$7.69 billion in 1995. The trade surplus remained over \$6 billion in 1996 and 1997, but has since decreased. The surplus was \$535 million in 2000.



Source: U.S. International Trade Commission.

### Trade with Canada

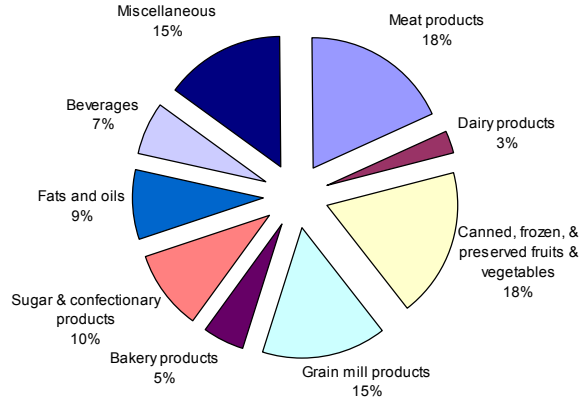
U.S. - Canada processed food trade has been increasing in dollar value (Figure 7). The solid line in figure 7 shows U.S. exports to Canada, and the dotted line shows U.S. imports from Canada. U.S. exports to Canada of SIC-20 products increased 279 percent, from \$1.4 billion in 1989 to \$5.3 billion in 2000. Canadian exports to the United States have increased 205 percent, from \$2.2 billion to \$6.7 billion, during that time period. The United States has, on average, been a net importer of processed goods from Canada. The average annual trade deficit for the United States during this period was \$251 million, but has been increasing in recent years. The United States had large trade deficit with Canada of \$816 million in 1989, but had a trade surplus in the following six years. The surplus became a deficit again in 1996; the trade deficit increased in each following year and totaled \$1.4 billion in 2000. The large increase in U.S. exports in 1990 seem to suggest that CUSTA had a more immediate impact on U.S. processed food exports to Canada. Canadian exports to the United States did not increase substantially during the first three years of the agreement, but started to increase more rapidly in 1992. The U.S. trade balance with Canada decreased every year starting in 1992. U.S. exports to Canada now seem to be leveling off while imports from Canada continue to increase.



Source: U.S. International Trade Commission.

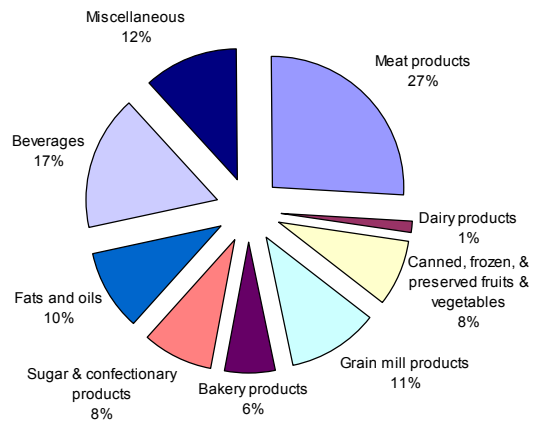
Meat products, fruits and vegetables, and grain mill products are the largest processed food groups that the United States exports, in dollar terms, to Canada (Figure 8). Eighteen percent of U.S. processed food exports to Canada during the 1989-2000 period were meat products; 18 percent were canned, frozen, and preserved fruits and vegetables, and 15 percent were grain mill products. In dollar terms, the greatest imports from Canada are for meat products and beverages (Figure 9). Close to 27 percent of U.S. processed food imports from Canada during the 1989-2000 period were meat products. Seventeen percent of imports were beverages and 11 percent were grain mill products. The amounts of trade to and from Canada of each processed food category as a percent of total processed food trade has not changed significantly during the 1989-2000 period, with a few exceptions. Canadian exports of canned, frozen, and preserved fruits and vegetables to the United States are accounting for an increasing percentage of total processed food exports, while beverage exports to the United States accounted for a decreasing percentage of total exports. The percent of U.S. exports to Canada accounted for by meat products has slightly decreased. Overall, however, the types of processed foods, as categorized by the three-digit SIC codes, have not changed significantly.

**Figure 8. U.S. Processed Food Exports to Canada by Classification, 1989-2000**



Source: U.S. International Trade Commission.

**Figure 9. U.S. Processed Food Imports from Canada by Classification, 1989-2000**



Source: U.S. International Trade Commission.

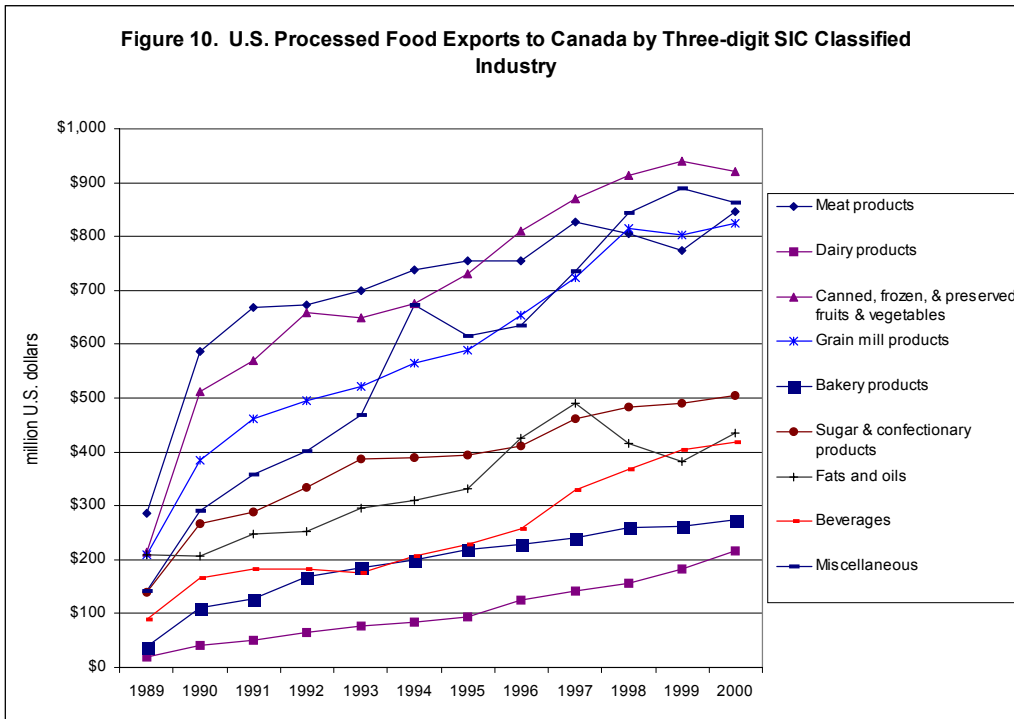
Figure 10 shows U.S. exports to Canada since 1989 for each of the nine 3-digit classes. Figure 11 shows U.S. imports from Canada and Figure 12 shows the trade balance with Canada for each product class for 1989-2000. The United States has been a net importer of meat products, bakery products, fats and oils, and beverages from Canada. The United States has also been a net importer from Canada of sugar and confectionary products in recent years. The annual trade deficit during the 1989-2000 period averaged \$443 million for beverages, \$368 million for meat products, \$79 million for fats and oils, and \$59 million for bakery products. The trade deficits for meat products and bakery products have been increasing; the fats and oil trade deficit was increasing until 1999. The U.S. trade deficit with Canada for meat products increased to \$1.1 billion in 2000.

The United States has been a net exporter to Canada of dairy products, fruits and vegetables, grain mill products, sugar and confectionary products, and miscellaneous products. The annual trade surplus with Canada during the 1989-2000 period averaged \$375 million for canned, frozen, and preserved fruits and vegetables; \$133 million for grain mill products; \$102 million for miscellaneous products; \$54 million for dairy products; and \$34 million for sugar and confectionary products. The trade balance for sugar and confectionary products has continually declined from a surplus of \$131 million in 1993 to a deficit of \$102 million in 2000.

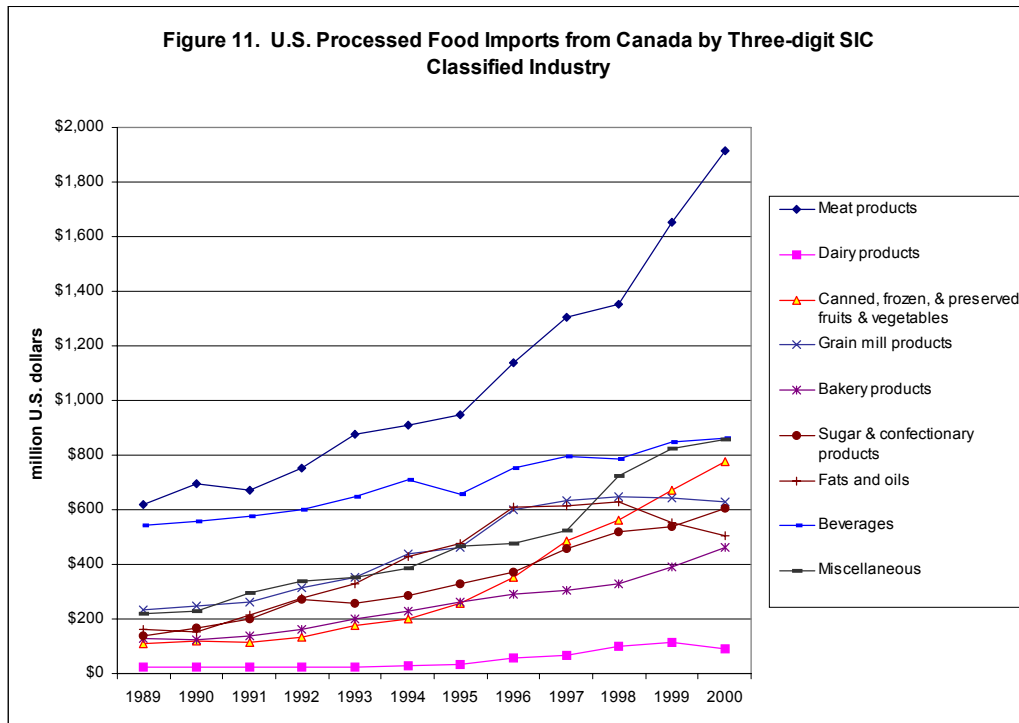
In dollar terms, most of the U.S. dairy exports to Canada are dry, condensed, and evaporated products. Dog and cat food account for the largest percentage of grain mill exports to Canada, followed by wet corn milling products, prepared feeds and feed ingredients for animals and fowls (except cats and dogs), and cereal breakfast foods. Flour and other grain mill products account for only a small percentage of grain mill exports to Canada, in dollar terms. Slightly less than half of the sugar and confectionary product exports to Canada is chocolate and cocoa products. Salted and roasted nuts and seeds and candy and other confectionary products account for most of the rest of the sugar and confectionary product exports to Canada. Soybean oil mill products account for about half of the fats and oils exports to Canada.

Exports of bottled and canned soft drinks and carbonated waters to Canada have increased rapidly since 1996. These products now account for nearly 40 percent of the beverage exports to Canada. Exports of wines, brandy, and brandy spirits to Canada have also been increasing, accounting for the second largest percentage of beverage exports to Canada, followed by distilled and blended liquors. Exports of malt beverages to Canada have remained fairly constant. Roasted coffee accounts for about 20 percent of the miscellaneous exports to Canada classified under SIC-209. Canned and cured fish and seafood; potato chips, corn chips, and similar snacks; and macaroni, spaghetti, vermicelli, and noodles also account for a portion of miscellaneous exports. Over half of the miscellaneous exports is classified as food preparations that are not classified elsewhere.

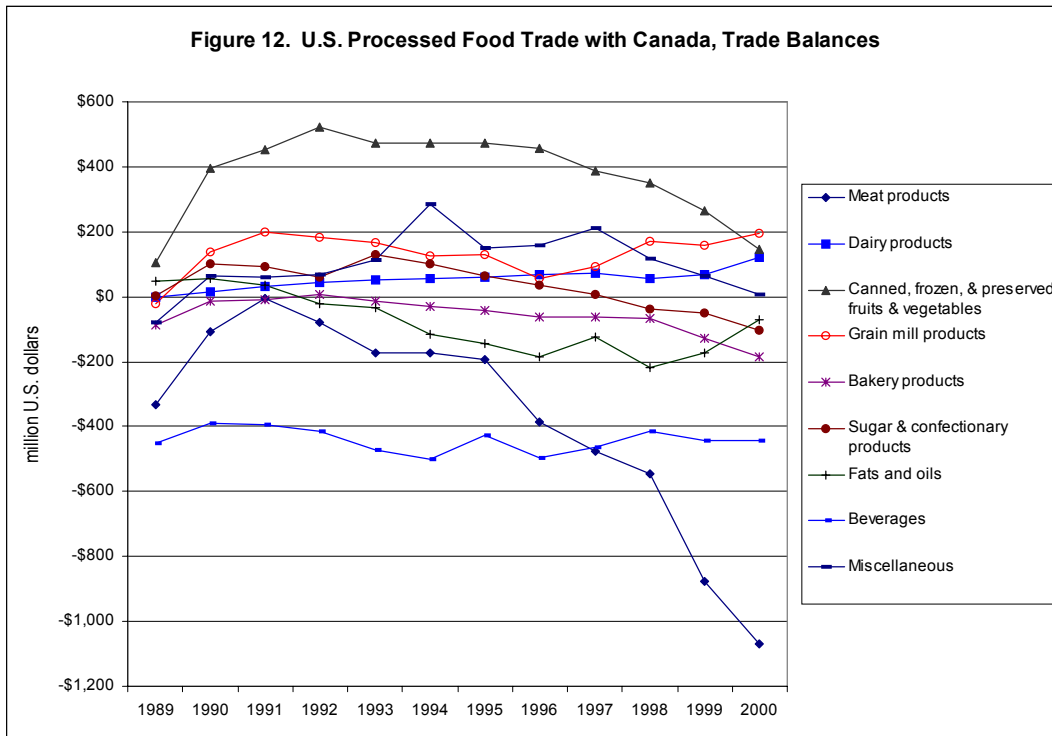
Imports of dry, condensed, and evaporated dairy products increased rapidly from 1995 to 1999; they account for about half of the dairy product imports from Canada. Cheese also accounts for a significant percentage of the dairy imports. A majority of the canned, frozen, and preserved fruit and vegetable imports from Canada are frozen fruits, fruit juices, and vegetables. Imports of these products and other fruit and vegetable products have been increasing rapidly.



Source: U.S. International Trade Commission.



Source: U.S. International Trade Commission



Source: U.S. International Trade Commission.

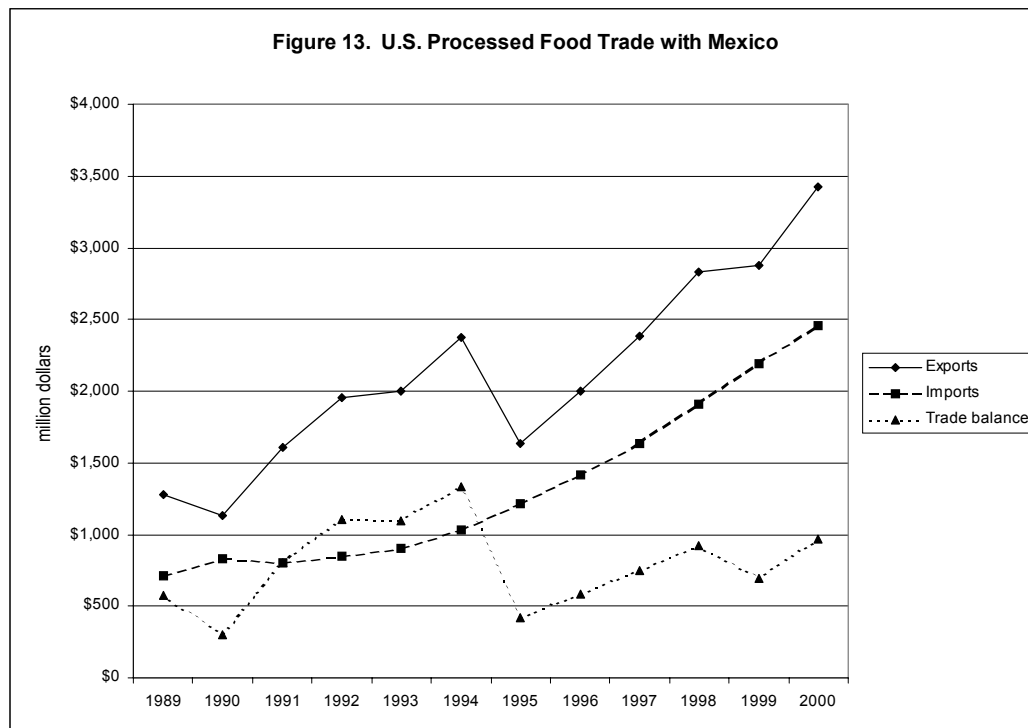
Imports of all types of grain mill products have generally been increasing, except for wet corn milling products; imports of wet corn milling products from Canada has remained fairly constant in nominal dollar terms. Prepared feeds and feed ingredients for animals account for the largest percentage of grain mill product imports from Canada. Prepared flour mixes and dough is second followed by cereal breakfast foods. Among grain mill products, imports of prepared flour mixes and dough has increased at the greatest pace. Imports of most other grain mill products began to decrease slightly in 1997, but imports of prepared flour mixes and dough continued to increase.

A majority of the sugar and confectionary imports from Canada are chocolate and cocoa products, while most of the fats and oils imports are vegetable oil mill products (not including corn, cottonseed, or soybeans). The largest percentage of beverage imports from Canada are distilled and blended liquors, followed by malt beverages and bottled and canned soft drinks and carbonated waters. Imports of food preparations that are not classified elsewhere have increased dramatically, they now account for close to half of the imports classified as SIC-209. The next largest imports from Canada in this category is canned and cured fish and seafood, followed by prepared fish or frozen fish and seafood.

## Trade with Mexico

Processed food trade with Mexico has increased significantly under NAFTA (Figure 13). U.S. exports to Mexico are shown as the solid line in figure 13, and U.S. imports from Mexico are the dashed line. U.S. exports to Mexico increased from \$1.1 billion in 1989 to \$3.4 billion in 2000. There was a sharp decline in U.S. exports to Mexico in 1995, most likely due to the peso crisis, but exports to Mexico have since increased significantly. Imports from Mexico started to increase significantly in 1994, and has continued to increase. Mexican exports to the United States have increased from \$700 million in 1989 to \$1.0 billion in 1994 to \$2.5 billion in 2000. The United States has been a net exporter of processed food products to Mexico during the entire 1989-2000 period. While both imports and exports are increasing, the trade balance does not seem to be showing any significant trend.

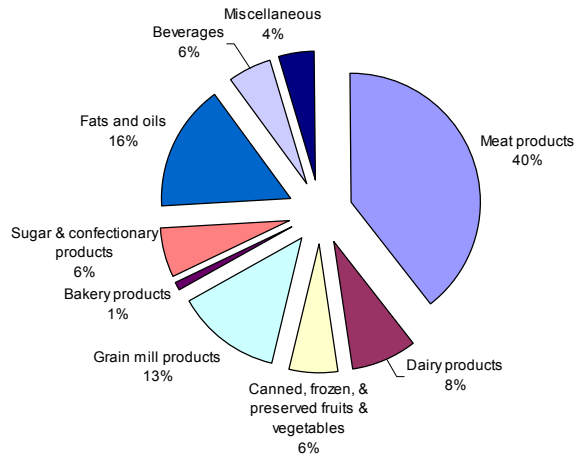
Meat products are the largest U.S. processed food exports to Mexico, in dollar terms. During the 1989-2000 period, 40 percent of U.S. processed food exports to Mexico consisted of meat products (Figure 14). The next two largest categories exported to Mexico were fats and oils (16 percent) and grain mill products (13 percent). The greatest imports from Mexico, in dollar terms, are beverages and canned, frozen, and preserved fruits and vegetables. These two categories account for 70 percent of the U.S. processed food imports from Mexico during the 1989-2000 period (Figure 15). From 1989 to 1994, fruit and vegetables were the food products most imported from Mexico, but in 1995, imports of beverages from Mexico surpasses those of fruits and vegetables and continued to increase substantially. In 2000, 52 percent of the food product imports from Mexico consisted of beverages.



Source: U.S. International Trade Commission

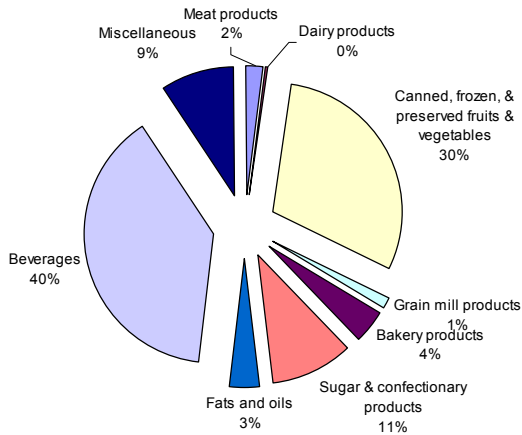


**Figure 14. U.S. Processed Food Exports to Mexico by Classification, 1989-2000**



Source: U.S. International Trade Commission.

**Figure 15. U.S. Processed Food Imports from Mexico by Classification, 1989-2000**



Source: U.S. International Trade Commission

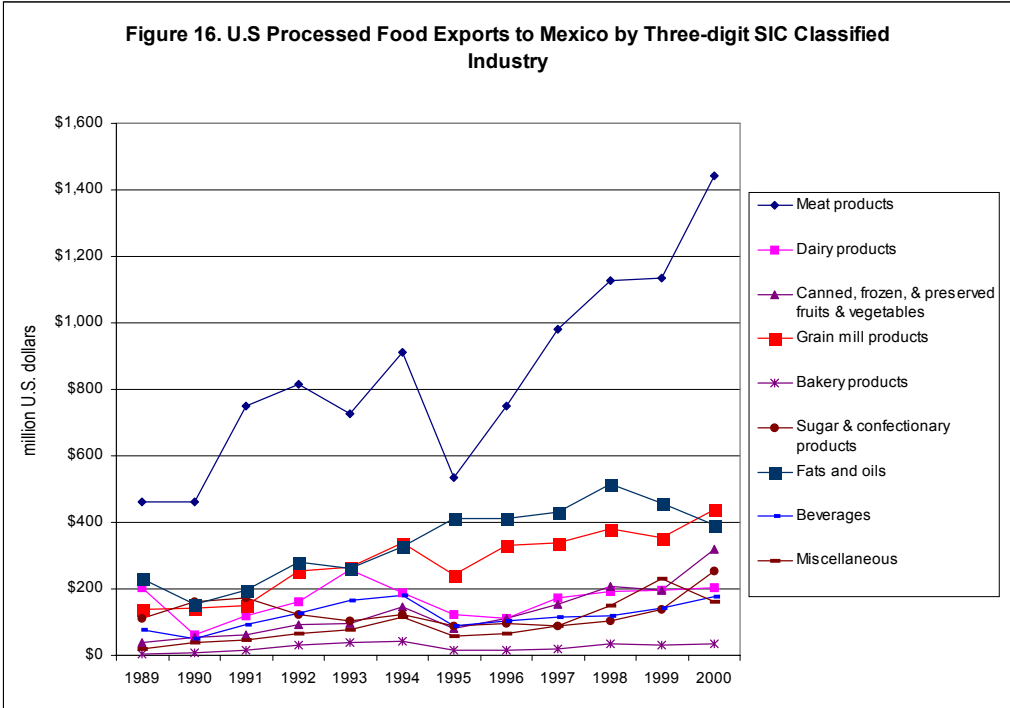
Figure 16 shows U.S. exports to Mexico for each of the nine 3-digit classes since 1989. Figure 17 shows U.S. imports and Figure 18 shows the trade balance with Mexico for each product class. The United States is a large net exporter of meat products to Mexico, and is also a net exporter of grain mill products, fats and oils, and dairy products. The United States is a large net importer of beverages from Mexico, and also a significant net importer of canned, frozen, and preserved fruits and vegetables. The trade deficit in beverages has been increasing substantially since 1994. The United States also has a small trade deficit with Mexico in most years for bakery products and miscellaneous products. The United States was a net exporter of sugar and confectionary products to Mexico from 1989 to 1994, but became a net importer in 1995. From 1995 to 1999, the sugar and confectionary trade deficit with Mexico increased each year, but in 2000, the trend stopped and the United States had a small trade surplus in this category.

Greater than half of the dairy exports to Mexico consist of dry, condensed, and evaporated dairy products. Natural, processed, and imitation cheese is consuming an increasing percentage of the dairy exports to Mexico. Of the canned, frozen, and preserved fruits and vegetables exported to Mexico, the largest percentage consists of dried and dehydrated fruits, vegetables, and soup mixes. In recent years, wet corn milling products and dog and cat food accounted to about half of the grain mill product exports to Mexico. Dog and cat food exports to Mexico have increased substantially since the mid-1990s. Soybean oil, vegetable oil, and animal and marine fats and oils account for fairly equal portions of U.S. fats and oils exports to Mexico. The sugar and confectionary product exports to Mexico consist largely of chocolate and cocoa products. Food preparations not classified elsewhere have accounted for 50-90 percent of the miscellaneous product exports to Mexico.

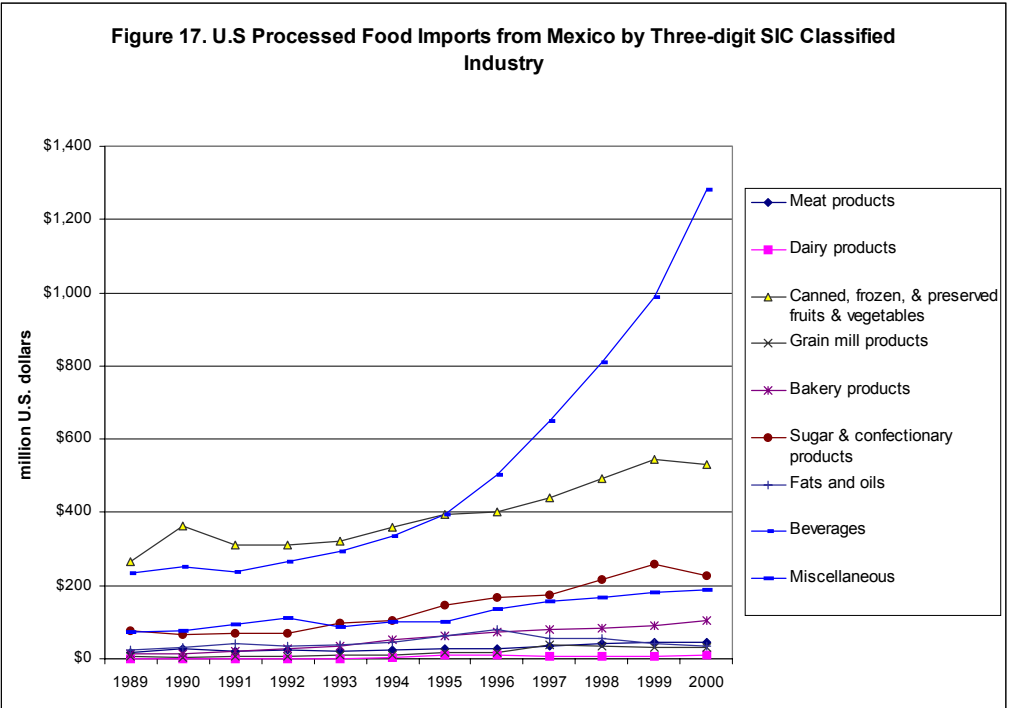
Imports of malt beverages from Mexico have increased substantially. About 60 percent of the beverage imports from Mexico consist of malt beverages. The United States has also increased imports of distilled and blended liquors and bottled and canned soft drinks and carbonated waters from Mexico. The United States exports some liquors and malt beverages and other beverages to Mexico, but in small quantities compared to the level of imports. The United States also exports malt to Mexico.

About half of the canned, frozen, and preserved fruits and vegetables imported from Mexico consist of frozen fruits, fruit juices, and vegetables. The United States also imports significant quantities of canned fruits, vegetables, preserves, jams, and jellies; and pickled fruits and vegetables, vegetable sauces and seasonings. Grain mill product imports from Mexico are very small and consist largely of cereal breakfast foods and some wet corn milling products.

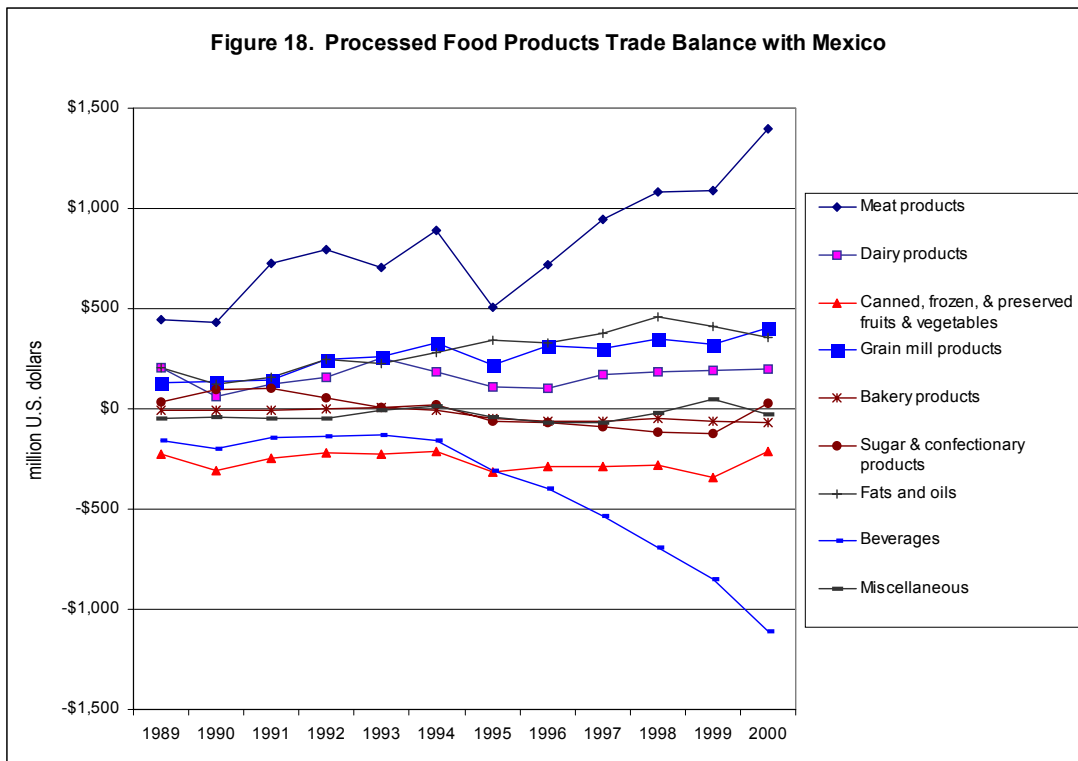
Imports of refined cane sugar from Mexico have increased rapidly during the 1990s, from 22 percent of the total sugar and confectionary product imports from Mexico in 1993, in dollar terms, to 46 percent in 2000. Imports of other sugar and confectionary products from Mexico have increased slightly. A majority of the fats and oils imports from Mexico are vegetable oils (except corn, cottonseed, and soybean). The United States, though, is a net exporter to Mexico in all of the fats and oils categories. The largest portion of the miscellaneous product imports from Mexico consists of food preparations not classified elsewhere. The United States also imports from Mexico significant quantities of canned and cured fish and seafoods; and prepared, fresh or frozen fish and seafoods.



Source: U.S. International Trade Commission.



Source: U.S. International Trade Commission

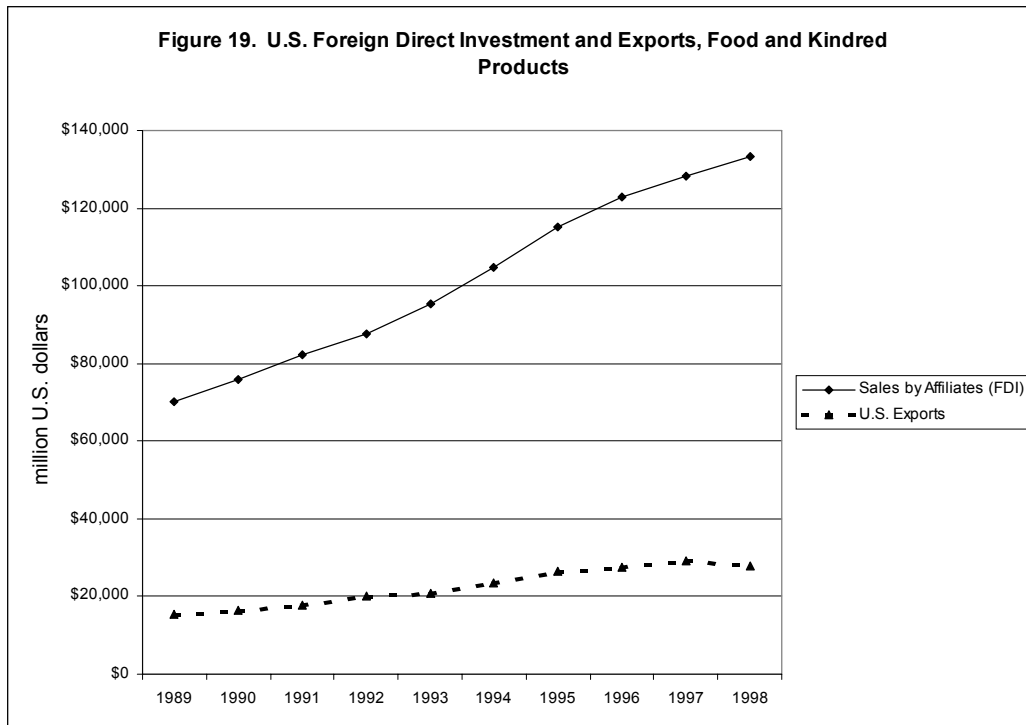


Source: U.S. International Trade Commission.

Canada and Mexico are important trading partners with the United States in the processed food industry. Resource endowments in these two countries differ. Canada is similar to the United States in resource endowments, while Mexico is different. As a result, processed food trade between the United States and Canada is characterized as an intra-industry trade with differentiated products. On the other hand, trade with Mexico is characterized as inter-industry trade on the basis of the principles of comparative advantage.

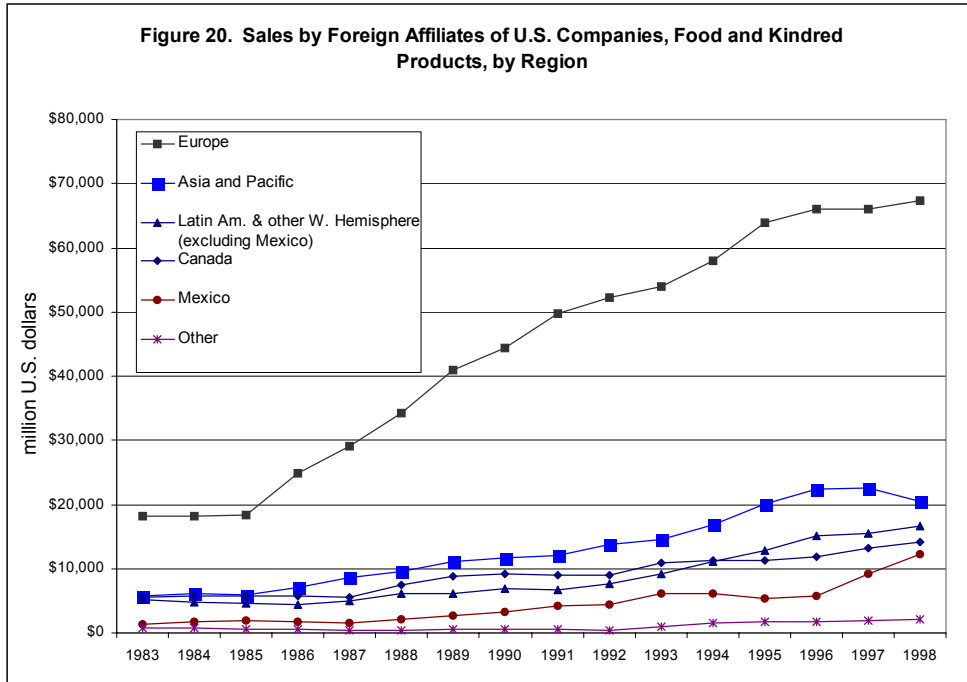
### Foreign Direct Investment

Foreign direct investment in the processed foods industry is a more widely used strategy than exports. Sales by affiliates in foreign countries has been increasing rapidly and is much greater than exports from the United States (Figure 19). Total sales by U.S. affiliates of companies in the SIC-20 category in 1998 were \$133 billion. Total exports in 1998 were \$28 billion. Foreign direct investment data were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The BEA defines a U.S. affiliate as “a business enterprise in which there is foreign direct investment - that is, in which a single foreign person owns or controls, directly or indirectly, 10 percent or more of the voting securities or an equivalent interest.” A foreign affiliate of a U.S. company consists of all foreign business enterprises owned 10 percent or more, directly or indirectly, by a U.S. person.

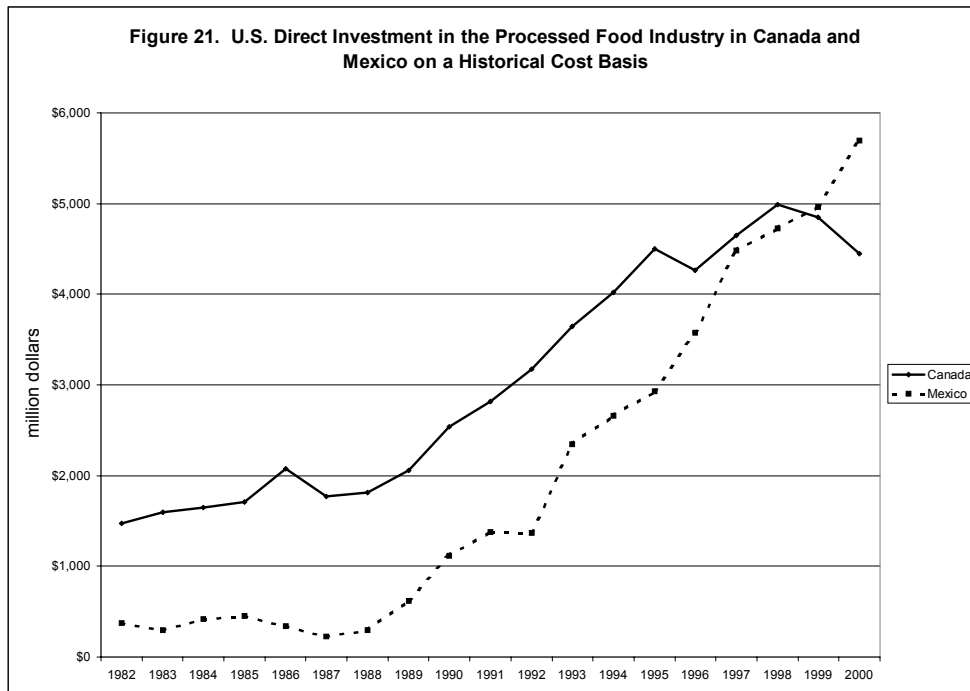


Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Sales by affiliates of U.S. companies in foreign countries have been steadily increasing from \$60 billion in 1988 to \$133 billion in 1998. About half of the U.S. FDI in the processed food industry has been in Europe (Figure 20). Sales from affiliates in Europe increased from \$34 billion in 1988 to \$67 billion in 1998. U.S. FDI has been largest in the United Kingdom, Canada, Germany, Mexico, and the Netherlands. In 1998, sales from affiliates in the United Kingdom totaled \$17.5 billion; sales totaled \$14.2 billion in Canada, \$12.3 billion in Mexico, \$9.0 billion in the Netherlands, \$6.8 billion in France, \$5.7 billion in Japan, and \$4.4 billion in Spain; data from Germany, Brazil, and Argentina were not available. U.S. FDI in Latin America has been increasing significantly. Sales of affiliates in Latin America and other Western Hemisphere countries (excluding Canada) increased from \$8.1 billion in 1988 to \$29.0 billion in 1998. Sales in Mexico increased from \$2.1 billion in 1988 to \$12.3 billion in 1998. Sales by affiliates in Asia and the Pacific totaled \$20.5 billion in 1998. Figure 21 shows U.S. investment in the processed food industry in Canada and Mexico from 1982 to 2000 measured on a historical cost basis. This figure shows that investment in Canada and Mexico have increased substantially since the late 1980s. Investment in Canada has leveled off, but investment in Mexico continues to increase.



Source: U.S. Department of Commerce, Bureau of Economic Analysis.



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Total assets of foreign affiliates in the processed food industry totaled \$129 billion in 1998. Total assets of affiliates totaled \$67.9 billion in Europe, \$28.7 billion in Latin America and other Western Hemisphere countries (excluding Canada), \$18.2 billion in Asia and the Pacific, \$1.8 billion in Africa, \$391 million in the Middle East, and \$12.0 billion in Canada. Assets totaled \$21.5 billion in the United Kingdom and \$15.0 billion in Mexico. FDI in Mexico has increased dramatically over recent years; total assets of affiliates in Mexico totaled only \$1.2 billion in 1988 and increased to \$5.8 billion in 1996 and \$15.0 billion in 1998. Assets in Canada increased from \$5.1 billion in 1988 to \$19.9 billion in 1996, but then decreased to \$12.0 billion in 1998.

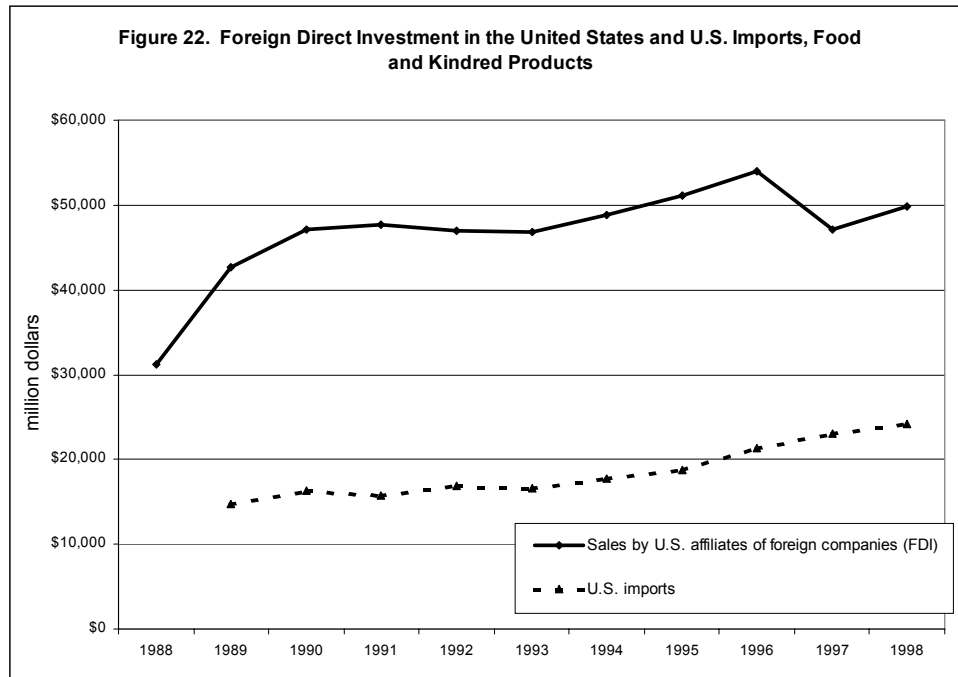
Data on foreign direct investment in the United States were also obtained from the U.S. Department of Commerce, Bureau of Economic Analysis. Sales by U.S. affiliates of foreign companies in the processed food industry increased from \$31 billion in 1988 to \$54 billion in 1996, and then decreased slightly to \$50 billion in 1998 (Figure 22). Sales by U.S. affiliates of foreign companies is greater than U.S. imports.

The majority of FDI in the United States is from European companies (Figure 23). Sales of U.S. affiliates of European companies totaled \$36 billion in 1998. A significant amount of those sales are from companies from the United Kingdom. Sales of U.S. affiliates of companies from the United Kingdom totaled \$12.1 billion in 1998 and averaged \$14.1 billion during the 1989-1998 period. Switzerland also has a significant amount of FDI in the United States. U.S. affiliates of Swiss companies had sales of \$10.3 billion in 1998 and average sales of \$9.5 billion during the 1992-1998 period. Sales from U.S. affiliates of Canadian companies averaged \$5.9 billion during the 1989-1998 period, while sales from U.S. affiliates of Japanese countries averaged \$5.4 billion during that period.

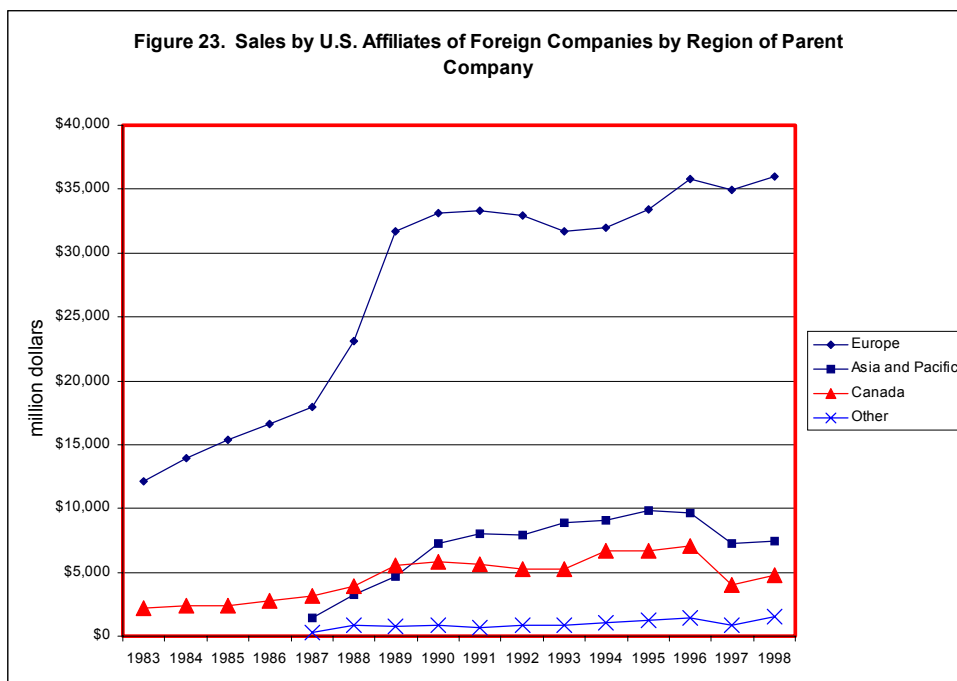
### **Factors Affecting Trade Flows**

Foreign direct investment may affect trade flows. This effect may be either positive or negative, depending on the relationship between FDI and exports (i.e., compliment or substitute in nature). FDI and trade are substitutes if FDI in a foreign country replaces trade. FDI and trade are compliments if FDI in a foreign country creates more trade with that country. The complimentary relationship may exist if the affiliate in the foreign country can create a market for products from the home country to be exported there, or if the affiliate needs intermediate products imported from the home country. Economic conditions such as national income of the importing country and the exchange rate affect trade flows; free trade agreements, export price, and transportation costs may also affect trade flows.

As national income increases, imports are likely to increase. The increase in trade flows between the United States and Canada and between the United States and Mexico could partly be explained by growth in GDP in these countries. Canada's real GDP increased by 31 percent from 1989 to 2000, while Mexico's real GDP increased by 48 percent. U.S. real GDP increased by 41 percent during this period. U.S. processed food trade with Canada and Mexico has increased rapidly during the last decade, part of this increase may be explained by a strong economy.



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

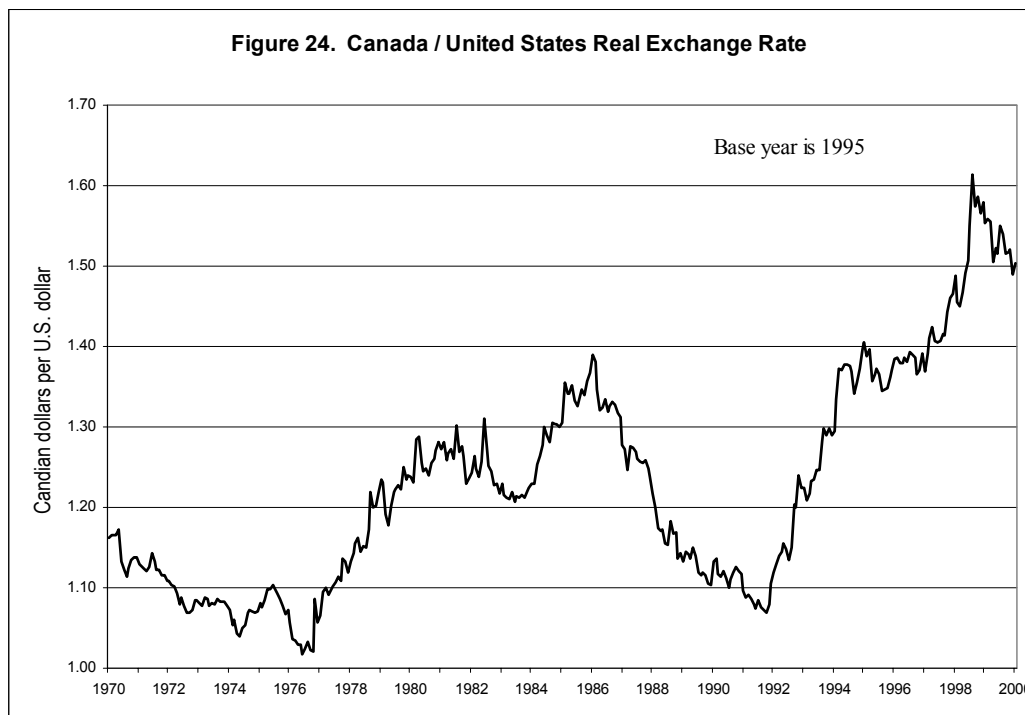


Source: U.S. Department of Commerce, Bureau of Economic Analysis

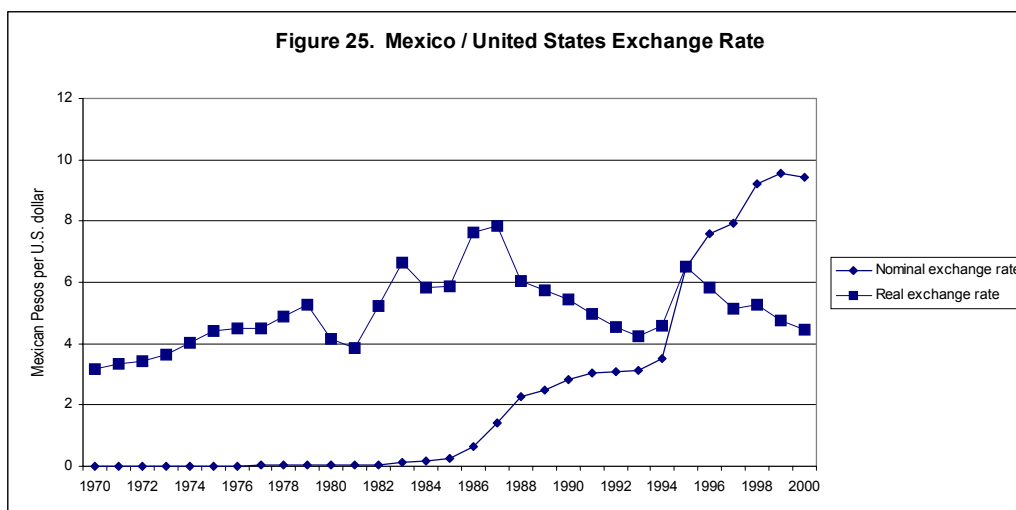


The exchange rate is a likely factor affecting trade flows. A depreciating currency can have a positive effect on exports and a negative effect on imports. Likewise, an appreciating currency can have a negative effect on exports and a positive effect on imports. Figure 24 plots the Canada/U.S. real exchange rate with 1995 as the base year. The Canadian dollar has been declining in value relative to the U.S. dollar since 1991. The devaluation in the 1990s has coincided with the increase in agricultural exports from Canada to the United States under CUSTA. Appreciation of the U.S. dollar makes U.S. goods more expensive in the foreign market and foreign goods less expensive in the U.S. market. The change in the exchange rate may have some effect on trade flows. Figure 25 shows the nominal and real exchange rate between the Mexican peso and the U.S. dollar. In nominal terms, the U.S. dollar has appreciated considerably against the Mexican peso. The depreciation of the peso has been largely due to high inflation in Mexico. In real terms, the U.S. dollar has not been appreciating against the peso.

Free trade agreements affect trade flows. The Canada-U.S. Free Trade Agreement (CUSTA) was implemented in 1989 and gradually reduced barriers to trade between the United States and Canada. The full effect of CUSTA on processed trade flows between the United States cannot be determined because data are not available prior to 1989. The data do suggest, however, that CUSTA may have affected trade flows. The effect on U.S. exports to Canada appears to have been immediate. U.S. processed food exports to Canada nearly doubled in nominal dollar terms from 1989 to 1999. The United States went from a net importer of processed foods from Canada in 1989 to a net exporter until 1996. Canadian exports to the United States also increased after CUSTA, but at a slower rate initially. By the mid-1990s, Canadian exports to the United States were increasing more rapidly than U.S. exports to Canada; the United States once again became a net importer of processed goods from Canada.



Source: Economic Research Service, USDA



Source: Economic Research Service, USDA

The North American Free Trade Agreement (NAFTA) of 1994 added Mexico to the free trade agreement. NAFTA does appear to have affected processed food trade flows with Mexico. Imports from Mexico have increase rapidly since 1994, and exports to Mexico have increased since 1995. Exports to Mexico, though, were increasing fairly significantly prior to NAFTA. Exports to Mexico were increasing from 1989 to 1994, but then decreased in 1995, and have since increased significantly.

It is widely considered that processed food products produced in the NAFTA countries generally differ from one another. Thus, the processed food industry can be classified as having imperfect competition. Regional free trade agreements facilitate intra-industry trade of the differentiated processed food products and consequently increase production efficiency, resulting in an increase in trade volume. Figure 25 illustrates a version of the intra-industry trade model discussed by Salvatore (2001). In this figure, the horizontal axis represents the number of firms in an industry, and the vertical axis shows price and average production cost. The price curve is negatively sloped because product price decreases when the number of firms increase due to increased competition. The average cost curve is positively sloped because when more firms produce a given industry output, each firm's share of the industry output decreases, and so each firm will incur higher average costs of production (Salavatore, 2001). The intersection of the price and average cost curves is the equilibrium point where each firm breaks even. By expanding international trade, firms in each country can specialize in production of a smaller range of products and can reduce their average costs. The average cost curve shifts down because an increase in market size or total industry sales due to NAFTA increases the market share for each firm, which results in a lower average cost of production for each firm (Salvatore, 2001). Trade expansion resulting from the regional free trade agreements such as NAFTA induces a greater number of firms into the food processing industry and results in lower average cost and price in the industry.

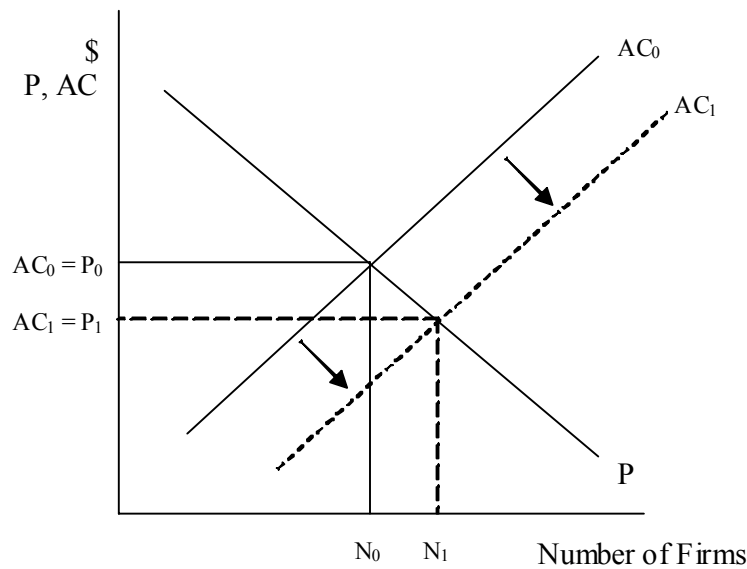


Figure 26. Monopolistic Competition and Intra-Industry Trade

To assess the impact of the free trade agreement, it is interesting to look at how Canada's and Mexico's export and import shares with the United States have changed since the free trade agreements were implemented. Table 6 shows how Canada's import shares of U.S. exports have changed since 1989 for processed food products and for each product class; Table 7 shows Canada's export shares of U.S. imports. Table 8 shows Mexico's import shares of U.S. exports during the 1989-2000 period, and Table 9 shows Mexico's export shares of U.S. imports during this period. Import and export shares for Canada since 1989 and for Mexico since the implementation of NAFTA have generally been increasing (exports to Mexico decreased sharply in 1995, most likely because of the peso crisis, but have rebounded). Data show that processed food trade with Canada and Mexico has increased partly because total processed food trade has increased with lower prices resulting from elimination of trade barriers (trade creation effects) and partly because trade with Canada and Mexico is replacing trade with other countries (trade diversion effects).

Table 6. Canada's Import Shares of U.S. Processed Food Exports (percent of U.S. exports imported by Canada)

	Food & kindred products (SIC 20)	Meat products (SIC 201)	Dairy products (SIC 202)	Preserved fruits & vegetables (SIC 203)	Grain mill products (SIC 204)	Bakery products (SIC 205)	Sugar & confectionary products (SIC 206)	Fats & oils (SIC 207)	Beverages (SIC 208)	Misc. (SIC 209)
1989	8.8	6.1	4.0	14.8	6.7	35.7	12.7	7.9	9.6	17.8
1990	15.7	11.4	9.0	27.6	12.5	58.6	19.5	9.0	15.9	31.0
1991	16.7	12.7	9.0	28.2	14.3	56.9	19.9	10.1	14.4	28.7
1992	16.1	11.5	7.7	29.0	14.3	57.2	21.8	8.8	12.6	27.7
1993	16.6	11.9	8.1	27.8	14.1	54.2	22.8	11.0	11.3	28.0
1994	16.4	10.7	9.6	26.0	14.3	53.9	20.8	10.5	10.9	33.5
1995	15.0	8.9	10.4	25.3	14.4	60.5	20.5	8.7	10.9	32.3
1996	15.6	8.5	14.7	26.9	15.3	60.3	19.0	11.5	11.9	29.4
1997	16.6	9.4	13.2	27.2	16.6	58.7	22.9	10.4	14.0	33.1
1998	18.1	10.2	15.1	28.8	19.2	61.2	25.6	8.9	16.3	36.6
1999	19.2	10.0	17.7	28.7	20.2	62.4	27.8	10.5	18.3	34.2
2000	18.7	8.9	18.7	27.8	20.7	65.4	25.7	13.1	19.0	34.9

Table 7. Canada's Export Shares of U.S. Processed Food Imports (percent of U.S. imports exported by Canada)

	Food & kindred products (SIC 20)	Meat products (SIC 201)	Dairy products (SIC 202)	Preserved fruits & vegetables (SIC 203)	Grain mill products (SIC 204)	Bakery products (SIC 205)	Sugar & confectionary products (SIC 206)	Fats & oils (SIC 207)	Beverages (SIC 208)	Misc. (SIC 209)
1989	14.6	22.0	2.9	4.6	45.3	37.2	7.4	19.1	14.9	12.7
1990	14.1	21.7	2.9	4.3	46.8	35.8	7.2	16.9	14.5	13.3
1991	15.8	21.1	3.1	5.1	46.1	36.4	9.2	22.5	15.9	15.6
1992	16.9	24.9	3.0	5.2	47.9	38.7	12.3	23.2	14.6	17.5
1993	19.4	28.3	3.2	7.6	50.1	42.8	12.2	27.5	16.1	18.7
1994	20.3	30.7	3.4	8.0	51.0	42.3	13.4	30.8	16.1	18.0
1995	20.8	35.3	3.2	9.8	51.6	43.8	13.9	31.1	14.2	20.0
1996	21.8	42.5	4.7	11.5	54.5	44.3	12.9	32.6	14.1	19.2
1997	22.5	42.9	5.8	15.2	52.8	43.2	14.6	32.5	13.2	19.4
1998	23.3	41.9	7.1	17.8	54.0	41.2	17.4	35.1	12.0	22.9
1999	23.6	45.4	8.0	18.2	53.8	42.8	18.0	34.1	11.4	23.9
2000	24.1	45.8	6.1	21.2	51.7	45.3	20.2	30.3	10.6	25.4

Table 8. Mexico's Import Shares of U.S. Processed Food Exports (percent of U.S. exports imported by Mexico)

	Food & kindred products (SIC 20)	Meat products (SIC 201)	Dairy products (SIC 202)	Preserved fruits & vegetables (SIC 203)	Grain mill products (SIC 204)	Bakery products (SIC 205)	Sugar & confectionary products (SIC 206)	Fats & oils (SIC 207)	Beverages (SIC 208)	Misc. (SIC 209)
1989	8.3	9.8	40.8	2.6	4.4	3.1	10.0	8.6	8.4	2.5
1990	6.9	9.0	13.9	2.9	4.6	4.8	11.7	6.7	4.9	4.0
1991	9.1	14.2	21.1	3.1	4.6	6.7	11.8	8.0	7.4	3.6
1992	9.7	14.0	18.9	4.1	7.3	11.0	8.1	9.8	8.6	4.6
1993	9.6	12.3	26.5	4.1	7.2	11.4	6.2	9.8	10.7	4.7
1994	10.1	13.2	21.1	5.5	8.5	11.8	6.6	11.1	9.5	5.8
1995	6.2	6.3	13.8	2.8	5.9	4.0	4.5	10.8	4.2	3.0
1996	7.3	8.4	13.2	3.7	7.7	3.6	4.5	11.2	4.9	3.1
1997	8.2	11.1	16.4	4.8	7.7	4.6	4.3	9.2	4.9	3.9
1998	10.1	14.2	18.8	6.6	9.0	8.2	5.5	11.1	5.3	6.5
1999	10.8	14.7	19.1	6.1	8.9	6.9	7.8	12.6	6.4	8.8
2000	12.1	15.2	17.8	9.6	10.9	8.4	13.0	11.8	8.0	6.5

Table 9. Mexico's Export Shares of U.S. Processed Food Imports (percent of U.S. imports exported by Mexico)

	Food & kindred products (SIC 20)	Meat products (SIC 201)	Dairy products (SIC 202)	Preserved fruits & vegetables (SIC 203)	Grain mill products (SIC 204)	Bakery products (SIC 205)	Sugar & confectionary products (SIC 206)	Fats & oils (SIC 207)	Beverages (SIC 208)	Misc. (SIC 209)
1989	4.8	0.6	0.1	11.2	1.2	3.8	4.2	2.9	6.4	4.1
1990	5.1	0.9	0.1	13.3	0.9	3.8	2.9	3.5	6.5	4.5
1991	5.1	0.7	0.1	13.6	0.9	5.8	3.3	4.4	6.5	5.0
1992	5.0	0.8	0.1	11.8	1.1	6.9	3.2	2.8	6.5	5.9
1993	5.4	0.7	0.1	13.8	1.2	7.3	4.7	3.3	7.3	4.5
1994	5.8	0.8	0.3	14.3	1.1	9.8	4.9	3.3	7.6	4.8
1995	6.5	1.0	1.0	15.1	2.0	10.2	6.1	4.2	8.6	4.3
1996	6.6	1.0	0.8	13.2	1.6	11.1	5.8	4.2	9.4	5.5
1997	7.1	1.1	0.5	13.8	3.2	11.2	5.5	3.0	10.8	5.9
1998	7.9	1.3	0.6	15.5	2.8	10.5	7.3	3.1	12.4	5.3
1999	8.3	1.2	0.5	14.7	2.5	10.1	8.6	2.7	13.3	5.3
2000	8.8	1.1	0.7	14.5	2.5	10.2	7.6	2.1	15.7	5.6

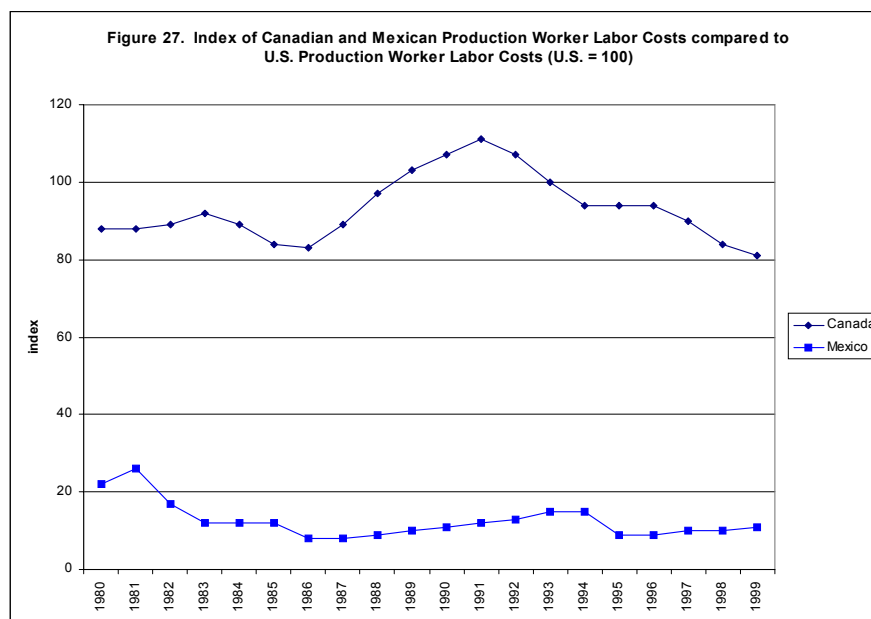
Trade flows can also be influenced by foreign production capacity, prices of goods, and transportation costs. If a country has a high production capacity, exports to that country are less likely because they have a greater ability to produce the products in their own country. Prices of goods can obviously affect trade flows. For example, exports are likely to decrease if price in the exporting country increases. Transportation costs can also affect trade. The further two countries are from each other, the less likely trade will occur because of transportation costs.

## Factors Affecting Foreign Direct Investment

Foreign direct investment may be influenced by the host country market size and market potential, wage rates, interest rates, transportation costs, tax considerations, exchange rates, exchange rate volatility, productivity in the host country, the regional trading area of the host country, and cultural linkages between the host country and the home country. When a firm invests in another country through FDI, they are basically looking to either take advantage of a new market or to decrease costs.

Market size and potential is likely a major factor affecting FDI. FDI will likely be greater in countries with a larger market size where per capita income is greater and where growth rates are high. These conditions are preferable because they provide a greater opportunity for the affiliate to sell its output. The regional trading area may also influence FDI because it allows free movements of capital among the member countries. Cultural linkages, or similarities between the countries, is also important. Firms are more likely to invest in countries that are similar to their home country in culture and resource endowments. They may feel more comfortable and may be more likely to sell their products in countries with similar cultures.

FDI may take place to take advantage of lower wage rates or lower interest rates in the host country or possibly because of tax advantages. Firms may also take into consideration government regulations when deciding where to invest; they may try to take advantage of countries with fewer environmental regulations, worker safety regulations, etc. Wage rates may be important, but so is labor productivity. Figure 26 shows production worker labor costs in manufacturing industries in Canada and Mexico as an index compared to U.S. labor costs in those industries. This figure shows that labor costs are considerably less in Mexico. Labor costs are also less in Canada than in the United States during most years. Another factor to consider is transportation costs. Firms may find it cheaper to produce a good in a foreign country rather than export the good partly because of transportation costs.



Source: U.S. Department of Labor, Bureau of Labor Statistics.

## Development of an Empirical Model

An econometric model is developed to estimate the effect of different factors on processed food trade flows between the United States, Canada, and Mexico. Separate models are estimated for U.S. exports to Canada, U.S. exports to Mexico, U.S. imports from Canada, and U.S. imports from Mexico. Another model is developed to estimate the effects of different factors on U.S. FDI in Canada and Mexico.

### Export and Import Equations

U.S. exports to country  $j$  are specified as a function of U.S. FDI in country  $j$ , the real exchange rate, real GDP in country  $j$ , a lagged U.S. export to country  $j$  variable, and seasonal dummy variables. U.S. imports from country  $i$  are specified as a function of FDI in the United States from country  $i$ , the real exchange rate, U.S. real GDP, a lagged import from country  $i$  variable, and seasonal dummy variables. The specified export model is:

$$X_{jt} = f_j(\text{FDI}_{jt}^{\text{US}}, \text{RER}_{jt}, \text{RGDP}_{jt}, X_{jt-1}, D1_t, D2_t, D3_t) \quad (1)$$

where

- $X_{jt}$  = U.S. exports to country  $j$  in time  $t$
- $\text{FDI}_{jt}^{\text{US}}$  = U.S. foreign direct investment in country  $j$  in time  $t$
- $\text{RER}_{jt}$  = real exchange rate between the U.S. dollar and country  $j$ 's currency in time  $t$
- $\text{RGDP}_{jt}$  = real GDP in country  $j$  in time  $t$
- $X_{jt-1}$  = lagged dependent variable
- $D1_t, D2_t, D3_t$  = seasonal dummy variables.

The specified import model is:

$$M_{it} = f_i(\text{FDI}_{it}^f, \text{RER}_{it}, \text{USR GDP}_t, M_{it-1}, D1_t, D2_t, D3_t) \quad (2)$$

where

- $M_{it}$  = U.S. imports from country  $i$  in time  $t$
- $\text{FDI}_{it}^f$  = foreign direct investment by country  $i$  in the United States in time  $t$
- $\text{RER}_{it}$  = real exchange rate between the U.S. dollar and country  $i$ 's currency in time  $t$
- $\text{USR GDP}_t$  = U.S. real GDP in time  $t$
- $M_{it-1}$  = lagged dependent variable
- $D1_t, D2_t, D3_t$  = seasonal dummy variables.

FDI is measured as sales by affiliates in real U.S. dollars. In the export model, the variable is sales of affiliates of U.S. companies operating in the foreign country (Canada or Mexico), and in the import model it is sales of affiliates of foreign (Canadian or Mexican) companies operating in the United States. Mexican FDI in the United States is not included in the imports from Mexico model because Mexico invests very little in the United States, and complete data are not available. If FDI has a positive sign, it complements exports; if it has a negative sign, it is a substitute for exports.

The exchange rate is measured as Canadian dollars or Mexican pesos per U.S. dollar; an increase in the variable indicates an appreciation of the U.S. dollar relative to the foreign currency. It is expected that exports to the United States are positively related to the exchange rate and that imports are inversely related to the exchange rate because U.S. goods become more expensive in the foreign market and foreign goods less expensive in the U.S. market when the U.S. dollar appreciates.

Real GDP is a measure of purchasing power. An increase in real GDP in the importing country is expected to have a positive effect on imports.

Quarterly dummy variables are included in the model to account for seasonality in trade flows. Three dummy variables are used for quarters 1 (January - March), 2 (April - June), and 3 (July - September). The dummy variable for quarter 4 (October - December) is dropped to avoid a multicollinearity problem.

This model is estimated using SIC 2-digit trade data for all processed food products as the dependent variable. The dependent variable in each case is measured in real U.S. dollars.

#### FDI Equation

U.S. foreign direct investment abroad is specified as a function of GDP growth in the foreign country, inflation in the foreign country, wage rates in the foreign country, the exchange rate, exchange rate volatility, regional trade agreements, and a country dummy variable. One model is estimated for both Canada and Mexico using the pooling technique. The specified model is

$$FDI_{jt}^{US} = g_j(RGDPGR_{jt}, INF_{jt}, LC_{jt}, RER_{jt}, ERV_{jt}, RTA_{jt}, DMEX) \quad (3)$$

where

$FDI_{jt}^{US}$  = U.S. foreign direct investment in country j in time t

$RGDPGR_{jt}$  = real GDP growth in country j in time t

$INF_{jt}$  = inflation in country j in time t

$LC_{jt}$  = labor cost in country j in time t compared with U.S. labor cost in time t

$RER_{jt}$  = real exchange rate between the U.S. dollar and country j's currency in time t

$ERV_{jt}$  = real exchange rate volatility for country j in time t

$RTA_{jt}$  = dummy variable for regional trade agreements with country j in time t

$DMEX$  = dummy variable for Mexico.

Real GDP growth in the host country is expected to have a positive effect on U.S. FDI. U.S. companies are more likely to invest in countries with a growing economy because there will be greater market potential for the company's product. Inflation is expected to have a negative effect; companies are likely to avoid investment in countries with high inflation rates. Labor cost in the host country is expected to have a negative effect. U.S. companies are likely to increase investment in a country when labor costs in that country are less relative to U.S. labor costs.

The real exchange rate could have a positive effect on FDI. If the U.S. dollar appreciates, products in the host country will be cheaper, and investment in that country may be more likely. It may also be possible that a weak foreign currency could be a sign that the country's economy is weak, in which case, U.S. firms may want to avoid investing in that country. Exchange rate volatility could have a positive effect on U.S. investment because firms may want to invest in the foreign country to avoid exchange rate risk. On the other hand, a high level of exchange rate volatility could indicate that the country's economy is unstable, and U.S. firms are likely to avoid investment in an unstable economy.

The regional trade agreement dummy variable is expected to have a positive effect on FDI. This variable equals 1 during years that a free trade agreement was in effect for that country (1989 to present for Canada and 1994 to present for Mexico), and 0 otherwise. The free trade agreements are expected to have positively influenced U.S. investment in Canada and Mexico. A dummy variable is also included for Mexico to determine if investment in Mexico differs from investment in Canada after all other factors have been accounted for.

### Data

Quarterly data for 1989 - 1998 are used in the export and import analysis. Annual data for 1982 - 1999 are used in the FDI model. The processed food trade data were obtained from the USITC's Interactive Tariff and Trade DataWeb. Data at both the 2-digit and 3-digit SIC classification levels were obtained for the analysis. This database includes U.S. export and import data segregated by country of origin and country of destination. Data classified at the 4-digit level were also obtained from this database to get a better description of the type of products being traded. These trade data are measured as nominal U.S. dollars and are converted to real dollars in the empirical analysis using the CPI. It's not possible for the trade data to be measured as a quantity because the data are an aggregation of different products. (Monthly data were available and obtained, but quarterly data were used in the analysis because of a lack of monthly data for some independent variables.)

Foreign direct investment data were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis. Nominal sales and total assets for foreign affiliates of U.S. companies were obtained from tables titled "Sales by Affiliates, Country by Industry" and "Total Assets by Affiliates, Country by Industry," in *U.S. Direct Investment Abroad: Operation of U.S. Parent Companies and their Foreign Affiliates*. Data on foreign direct investment in the United States were also obtained from the U.S. Department of Commerce, Bureau of Economic Analysis. Data were obtained from the table titled "Sales by Affiliates, Country of UBO by Industry of Affiliate" in the publication titled *Foreign Direct Investment in the United States: Operations of U.S. Affiliates of Foreign Companies*. The data for 1997 and 1998 in this data set are preliminary estimates.

Sales by affiliates were used as the measure of FDI in the export and import models. Nominal sales were converted to real sales by using the CPI. Annual data were available through 1998. The numbers in this dataset for 1998 are preliminary estimates. The annual data were converted to quarterly data to be used in the model by dividing the numbers by four.



Data for U.S. direct investment position abroad on a historical-cost basis for 1982 - 2000 were also obtained from the Bureau of Economic Analysis. These data were used for the dependent variable in the FDI model.

Data for the real exchange rate were obtained from the Economic Research Service. The data are adjusted for inflation with 1995 as the base year. The real exchange rate in the FDI model is converted to an index since there are data for both Canada and Mexico and the unit of measurement needs to be the same. The index is calculated as the exchange rate in a given year divided by the average exchange rate during the 1981-2000 period. Exchange rate volatility in the FDI model is calculated as the real exchange rate minus the 3-year moving average, and then squared.

Real GDP and real GDP growth data for the United States, Canada, and Mexico were obtained from the International Monetary Fund's World Economic Outlook Database. Inflation data in Canada and Mexico, measured as percent change in CPI, were also obtained from the IMF's World Economic Outlook Database. Labor cost data for Canada and Mexico were obtained from the U.S. Department of Labor, Bureau of Labor Statistics. Labor cost is measured as an index where labor cost in the United States equals 100.

### Estimation Procedures

The export and import models are estimated using ordinary least squares estimation (OLS). The models are corrected for 1<sup>st</sup>-order autocorrelation, which was detected using the Durbin-h statistic. A linear functional form is used for the estimation. Since FDI is endogenous, the instrumental variable technique is used to estimate Equations (1) and (2); the FDI variable is first estimated as a function of real GDP and lagged real GDP in the host country and real exchange rate and lagged real exchange rate. Equation (3) is not used to estimate the value of FDI in Equation (1) since Equation (1) uses quarterly data, while Equation (3) is based on annual panel data. The estimated values for FDI are then used in the export and import equations to estimate the parameters of these two equations as follows

$$X_{jt} = \alpha_0 + \alpha_1 \widehat{FDI}_{jt}^{US} + \alpha_2 RER_{jt} + \alpha_3 RGDP_{jt} + \alpha_4 X_{jt-1} + \alpha_5 D1_t + \alpha_6 D2_t + \alpha_7 D3_t + \varepsilon_t \quad (4)$$

$$M_{it} = \beta_0 + \beta_1 \widehat{FDI}_{it}^f + \beta_2 RER_{it} + \beta_3 USRGDP_t + \beta_4 M_{it-1} + \beta_5 D1_t + \beta_6 D2_t + \beta_7 D3_t + \varepsilon_t \quad (5)$$

Panel data, a combination of time series and cross section data, are used in the FDI model. The model uses annual data for two countries (Canada and Mexico) for 17 years (1983-1999). A pooling technique is used to estimate this model. A linear functional form is used for the estimation. The equation is specified as

$$FDI_{jt}^{US} = \gamma_0 + \gamma_1 RGDPGR_{jt} + \gamma_2 INF_{jt} + \gamma_3 LC_{jt} + \gamma_4 RER_{jt} + \gamma_5 ERV_{jt} + \gamma_6 RTA_{jt} + \gamma_7 DMEX + \varepsilon_t \quad (6)$$

## Results

The results do not conclusively indicate that there is either a compliment or substitute relationship between FDI and U.S. processed food trade with Canada and Mexico. Results indicate that U.S. imports from Canada are increasing mainly because of the growing U.S. economy and not because of the exchange rate. The exchange rate does not appear to have hindered exports to Canada. U.S. exports to Canada have been increasing, but Canadian GDP growth does not seem to be a significant factor for the increased exports. A growing Mexican economy has contributed to increased U.S. exports to Mexico, while a strong dollar hinders exports to Mexico. Imports from Mexico are influenced by U.S. real GDP.

Table 10 shows the results for the import and export models for Canada and Mexico. Calculated elasticities for real exchange rate and real GDP are shown on the bottom of table 10. These elasticities are the percent change in imports or exports that would result from a one percent change in either the real exchange rate or real GDP.

Canadian FDI in the United States has a negative effect on imports from Canada, and U.S. FDI has a positive effect on exports to Canada and Mexico. These results would indicate that U.S. FDI and exports are compliments, while foreign FDI in the United States and U.S. imports are substitutes. However, FDI was not found to have a statistically significant effect on imports or exports of processed food products with either Canada or Mexico. This result indicates that U.S. FDI in Canada and Mexico in the processed food industry has not significantly influenced processed food trade with Canada or Mexico.

Processed food trade with Canada does not appear to be sensitive to the exchange rate. The exchange rate has the expected sign in each case (a negative effect on exports and a positive effect on imports), but is statistically significant only for exports to Mexico. A 1 percent appreciation of the U.S. dollar relative to the Mexican peso leads to a 0.5 percent decrease in exports to Mexico, and vice versa.

U.S. real GDP is found to have a positive and significant effect on U.S. imports from both Canada and Mexico. A 1 percent increase in U.S. real GDP leads to a 0.99 percent increase in imports from Canada and a 1.49 percent increase in imports from Mexico. These elasticities are higher than expected. Mexican real GDP has a significant effect on exports to Mexico, but Canadian real GDP is not found to significantly affect U.S. exports to Canada. A 1 percent increase in Mexican real GDP is found to increase U.S. exports to Mexico by 1.54 percent. This result indicates that a growing Mexican economy is highly beneficial for U.S. exports.

The lagged dependent variable is significant and positive in each equation. This result indicates that imports or exports are greater if imports or exports were high in the previous period. This variable is highly significant and explains a significant amount of the variation in exports and imports, especially in the exports to Canada model. These results indicate that exports and imports can somewhat be explained by real GDP and exchange rate, but that much of the variation is due to other factors. Exports and imports to and from Canada and Mexico seem to be trending upwards even after the other variables have been accounted for. This upward trend could be due to trade liberalization under CUSTA and NAFTA.

Table 10. Results of Import and Export Models

Independent variables	Imports from Canada	Exports to Canada	Imports from Mexico	Exports to Mexico
	Estimated coefficients (p-value in parentheses)			
Intercept	<b>-4785</b> (0.0632)	-957 (0.5719)	<b>-3132793</b> (0.0003)	-1013404 (0.7054)
FDI	-0.021 (0.8076)	0.294 (0.5997)		39.94 (0.7486)
Real exchange rate	62.07 (0.9388)	-511.44 (0.9423)	33069 (0.4404)	<b>-418872</b> (0.0001)
Real GDP	<b>1.097</b> (0.0522)	0.589 (0.9423)	<b>528.04</b> (0.0007)	<b>5362</b> (0.0535)
Lagged dependent variable	<b>0.64</b> (0.001)	<b>0.82</b> (0.0001)	<b>0.53</b> (0.0003)	<b>0.24</b> (0.0342)
D1	<b>-983</b> (0.0001)	<b>-811</b> (0.0096)	<b>412595</b> (0.0001)	<b>-730744</b> (0.0001)
D2	-84 (0.5369)	147 (0.5807)	<b>665540</b> (0.0001)	<b>-954265</b> (0.0001)
D3	<b>-218</b> (0.0444)	155 (0.5823)	106926 (0.2881)	<b>-580293</b> (0.0013)
R <sup>2</sup>	0.991	0.911	0.957	0.900
<b>Elasticities</b>				
Real exchange rate	0.010	-0.084	0.065	<b>-0.496</b>
Real GDP	<b>0.988</b>	0.053	<b>1.489</b>	<b>1.538</b>

Results from the FDI model estimation indicate that inflation, labor cost, and free trade agreements significantly influence U.S. FDI in Canada and Mexico. Results also indicate that investment in Mexico is lower than investment in Canada after other variables have been accounted for. Real GDP growth in Canada or Mexico has a positive effect on U.S. investment, but the effect is not very significant statistically. Table 11 shows the results of the FDI model estimation.

Inflation and labor costs have negative effects on U.S. investment. U.S. companies will decrease investment in Canada or Mexico when inflation in those countries increases. Labor cost seems to be an important factor that U.S. firms consider when making investment decisions. Results indicate that when the ratio of foreign labor cost to U.S. labor cost decreases by 1 percent, investment in that country increases by 0.78 percent.

Table 11. Results of FDI Estimation

Independent variables	Estimated coefficient	Elasticities
Intercept	<b>4522</b> <b>(0.0238)</b>	
Real GDP growth	42.31 (0.2424)	0.068
Inflation	<b>-6.91</b> <b>(0.046)</b>	<b>-0.088</b>
Labor cost	<b>-26.33</b> <b>(0.0881)</b>	<b>-0.776</b>
Real exchange rate	-7.31 (0.2946)	-0.413
Exchange rate volatility	0.148 (0.8011)	0.008
Regional trade agreements	<b>1200</b> <b>(0.0001)</b>	
Mexico dummy variable	<b>-2443</b> <b>(0.0603)</b>	
<hr/>		
R <sup>2</sup> = 0.915		

Real exchange rate has a negative effect and exchange rate volatility has a positive effect on U.S. investment in Canada and Mexico, but the effect of both of these variables is statistically insignificant. Exchange rate and exchange rate volatility do not appear to be important factors affecting U.S. investment in Canada or Mexico in the processed food industry.

The regional trade agreement dummy variable is highly significant and positive, which indicates that U.S. FDI in Canada and Mexico has increased significantly since the inceptions of CUSTA and NAFTA, holding other variables constant. The result suggests that free trade agreements have positive effects on U.S. FDI. The dummy variable for Mexico is also significant, and is negative. This result indicates that U.S. investment in Mexico is smaller than investment in Canada after holding the other variables constant, which suggests that there has been some preference by U.S. firms to invest in Canada instead of Mexico despite factors such as low labor cost in Mexico. Mexico's labor costs are significantly lower than those in Canada, but FDI in Canada has exceeded FDI in Mexico until just recently. The situation may be changing as FDI in Mexico continues to increase and FDI in Canada levels off.

## Conclusions

Canada is the largest exporter of processed foods to the United States and the second largest importer of these products from the United States behind Japan. Canada and Mexico have, in recent years, become increasingly important trading partners in processed foods.

The study does not conclusively indicate any type of relationship between FDI and trade. For the most part, trade in processed foods has not been sensitive to the exchange rate. The real exchange rate does not significantly effect imports from Canada or Mexico or exports to Canada. The exchange rate, however, does effect exports to Mexico. Some of the increase in trade flows can be explained by growth in real GDP. Real GDP in the United States has positive effects on imports from Canada and Mexico, and Mexican real GDP has positively influenced U.S. exports to Mexico. Increases in U.S. exports to Canada cannot be attributed, according to these results, to an increase in Canadian real GDP. The lagged dependent variable and other factors such as trade liberalization appear to explain a significant amount of the upward trend in U.S. processed food trade with Canada and Mexico. This upward trend may be due to trade liberalization under CUSTA and NAFTA. The regional free trade agreements allow the processed food industries in the countries to be more efficient by increasing their production, which results in the trade volume of processed food products among the countries increasing faster than trade of unprocessed agricultural commodities.

CUSTA and NAFTA appear to have significantly influenced an increase in U.S. FDI in Canada and Mexico. Labor cost and inflation in the host country also influences U.S. FDI. U.S. firms look to avoid host countries with high inflation rates, and they look to take advantage of countries with low labor costs. U.S. firms have favored investment in Canada, holding all other variables constant. Despite significantly lower labor costs in Mexico, U.S. firms have, until recently, invested more in Canada. The situation may be changing if wages in Mexico continue to remain significantly lower than in Canada.

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