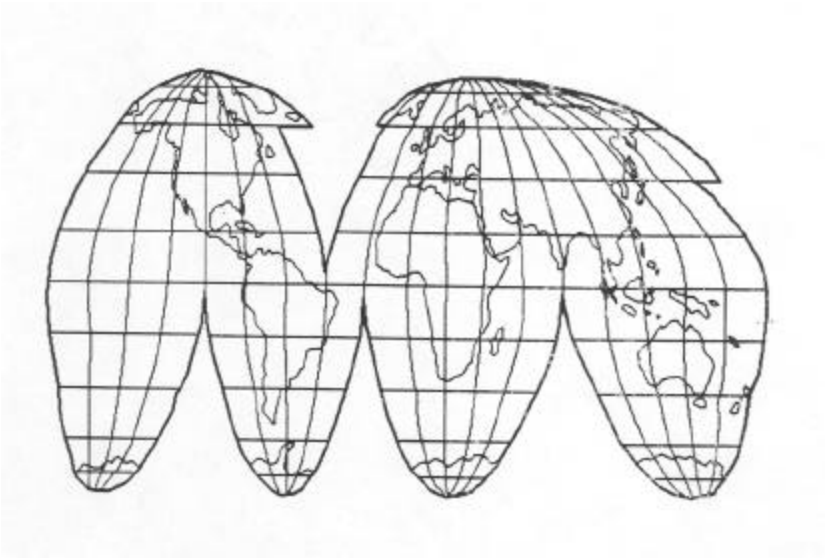
An Analysis of a United States-Canada-Mexico Free Trade Agreement



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International Agricultural Trade Research Consortium

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On

An Analysis of a United States-Canada-Mexico Free Trade Agreement

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Preface

The International Agricultural Trade Research Consortium (IATRC) is a group of more than 130 economists from thirteen different countries interested in agricultural trade, representing the academic community, governments, and private institutions. Founded in 1980, the IATRC has the following objectives:

- to promote and stimulate improvement in the quality and relevance of international agricultural trade research and policy analysis;
- to encourage collaborative research among its members;
- to facilitate interaction among researchers and analysts in different countries engaged in trade research; and
- to improve the general understanding of international trade and trade policy issues among the public at large.

This is one of two papers commissioned by the International Agricultural Trade Research Consortium on various aspects related to the agricultural sector of a prospective North American Free Trade Agreement. The companion paper to this one has been prepared by a working group chaired by Richard Barichello, University of British Columbia. To minimize duplication with the Barichello paper this paper has given greater attention to the role of Mexico, currency exchange rates, and explicit modeling of the trade relationship.

Special thanks are due to Evette Harris, University of Minnesota, for her able assistance with manuscript preparation.

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1. A Free Trade Agreement in a Broader Context*

The effects of the proposed Free Trade Agreement (FTA) between the United States, Canada, and Mexico should be distinguished from the relationships that already exist among the three countries and from those events that would occur in absence of the FTA. The countries are already important trading partners, and the larger economic size of the U.S. has brought about an asymmetrical relationship. The U.S. is a much more important trading partner for Canada and Mexico than either of those countries is for the U.S.

Certain important policy problems will continue to exist with or without a FTA. Mexico enters the trade negotiations with a large external debt, a much lower average wage and per capita income than its northern neighbors, a higher inflation rate, and a depreciating currency. The U.S. enters negotiations with a persistent trade deficit, international debtor status, and traditional manufacturing industries (automobiles, steel, textiles, and apparel) that have contracted due to import competition. U.S. fiscal policy has been characterized by chronic deficits. The unemployment rate has increased as part of the recession. Monetary policy may either be directed toward lower interest rates designed to shorten the recession or higher interest rates designed to strengthen the dollar.

It should be noted that certain Mexican products already benefit from the tariff preferences in absence of the FTA. The maquiladoras along the U.S. border are a major source of Mexican industrial exports. Certain products qualify for the General System of Preferences and the Caribbean Initiative. Thus, the initial trade situation in the U.S. facing Mexican producers is not one of non-discriminatory tariffs.

It should also be noted that, prior to the trilateral FTA negotiations, Mexico carried out substantial unilateral trade liberalization. Prior to 1983 the Mexican economy was subject to direct controls and the industrial sector was heavily protected. The main policy tools were import licenses, official prices, and the exchange rate (Sobarzo). Although 37 criteria were relevant to issuing import licenses, in practice the most important were (1) whether the imported product was produced in the country, and (2) whether domestic production was necessary to satisfy national needs. By 1982, 100% of import categories were subject to import licenses. Imports were also restricted by the use of official prices. They were the basis of tariff rates, and they were set at levels far above comparable world prices. Finally the use of an overvalued exchange rate made imported inputs artificially cheap for Mexican manufacturers.

Unilateral liberalization by Mexico began in 1983. The number of import categories subject to import licenses was reduced and by 1986 only 35% of categories were covered. However, 60% of agricultural products remained covered in 1991.

Mexico joined the GATT in 1986, and official prices were gradually eliminated and tariff rates fell. Maximum tariff rates fell from 100% to 20% in 1989, and the trade weighted average tariff fell from 25% in 1985 to 10% in 1989 (Sobarzo, p.16). Thus, U.S. exporters faced a more open Mexican market in 1991 than they did in 1980 even before the FTA negotiations began.

Agreement on a free trade area between the U.S. and Canada has already been reached, and implementation of the arrangement began in January 1989. The existence of the U.S.-Canada agreement makes the current trilateral negotiations less important for Canada than they would have been in absence of the bilateral agreement. The additional benefits to Canada from gaining greater access to the Mexican market are much smaller than the gains already obtained from the bilateral U.S.-Canadian agreement.

Indirect Influences on Agricultural Trade

Although this paper is primarily concerned with the effects of the FTA on agricultural trade, other aspects of the FTA will influence agricultural products indirectly. Agricultural machinery, pesticides, herbicides, fertilizer, and gasoline are important traded inputs that influence costs and the effective rate of protection for agricultural products. The scope of policy reform will influence trade. A significant issue is whether liberalization includes only tariffs and import quotas or whether it also includes production subsidies, price supports, input subsidies, parastatals, and other domestic policies that affect trade indirectly. In the U.S.-Canada agreement, only border measures were included.

Agricultural trade will also be influenced by international factor mobility. There will be a stronger incentive to make direct investments in Mexico by Americans and Canadians as well as investors from non-member countries. However, the amount of investment depends on relaxing Mexican restrictions on foreign investment. The Bush administration has stated that rules related to migration are not negotiable, but additional job opportunities in Mexico are expected to reduce the supply of migrants to the U.S. However, a reduction in migration may make it more difficult for American farmers to hire workers.

The Uruguay Round and Multilateral Trade

To the extent that the Uruguay Round of GATT negotiations succeeds in substantially lowering tariffs and relaxing import quotas on a most favored nation basis, the FTA and all preferential arrangements become less important. In the extreme case of complete elimination of all trade barriers by GATT, free trade agreements would have no effect on trade. In general, the effect of an FTA depends on the difference between a country's most favored nation tariff against non-members and its zero tariff against member countries. This difference represents the margin of discrimination in favor of members. Since the amount of damage imposed on non-members by an FTA depends on this margin of discrimination, the existence of FTA negotiations may influence the outcome of the Uruguay Round negotiations.

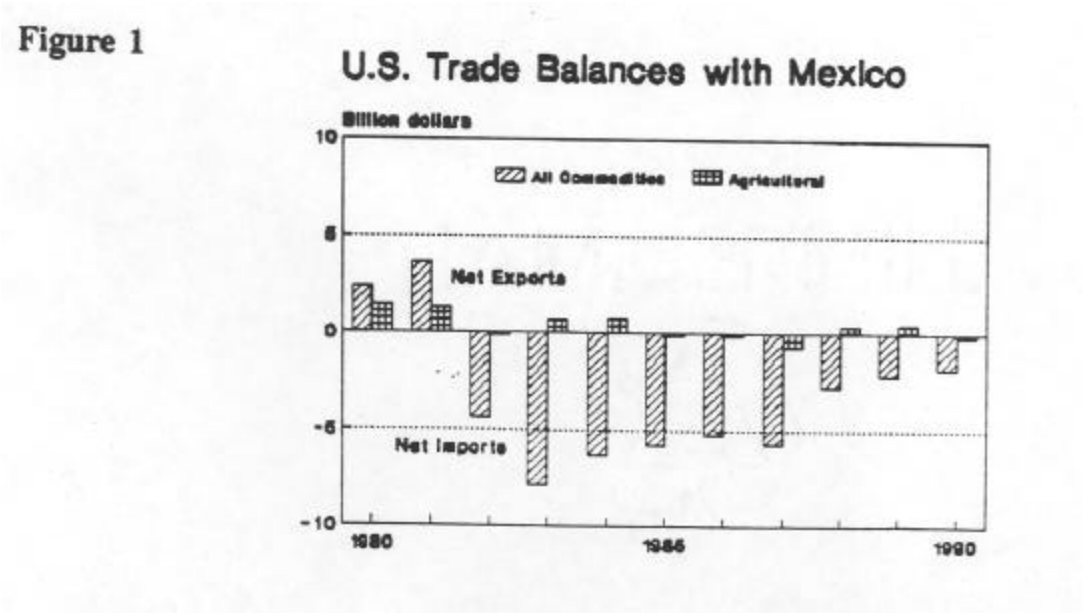
The outcome of the FTA also depends on whether membership is restricted to the U.S., Canada, and Mexico or whether additional countries in the Americas are added. For example, Chile and Costa Rica have already expressed interest in joining the FTA, and Mexico has discussed trade arrangements with other Latin American countries. As the number of participating countries gets larger the effects of the FTA approach those of multilateral liberalization. The effect of adding members to the FTA will be discussed in section eight of the paper.

2. Agricultural Trade Among the United States, Mexico, and Canada

The United States, Mexico and Canada are important trading partners. U.S.-Mexico bilateral agricultural trade increased from $3.5 million higher than in 1980 to a record level of $5.1 billion in 1990, about $10 million higher than in 1989 and nearly $1.0 billion higher than in 1988. Throughout the decade the value of this trade grew at an average annual rate of 6.5 percent, one of the highest growth rates among major U.S. agricultural trading partners. However, the growth pattern of U.S.-Mexican agricultural exports has differed. While Mexican agricultural exports to the United States showed a steady growth trend (aside from a surge in 1986 which was mainly the result of higher coffee prices), U.S. agricultural exports to Mexico have fluctuated widely, mainly reflecting Mexican harvest and adverse Mexican economic conditions.

In 1990, Mexico was the fourth largest single market for U.S. farm exports (after Japan, Canada, and Korea, fifth if the EC is included), with total export value of a record $2.55 billion. As a source of products, Mexico was our second largest supplier of agricultural products (after Canada), with total shipments of a record $2.6 billion in 1990. Despite a slight agricultural trade deficit with Mexico in 1990, the balance was in the U.S. favor for most of the 1980's.

Figure 1



Agricultural trade with Mexico accounts for less than 2 percent each of Canada's total agricultural exports and imports. Wheat, canola (rapeseed), and dairy products dominate Canada's agricultural exports to Mexico. Wheat exports to Mexico are made by the Canadian Wheat Board (CWB); sales have also benefited from government-backed credit. Canola exports are done by private government-backed credit and other government export promotion programs. Canada's dairy product exports, mainly nonfat dry milk, result from surplus production generated by Canada's supply management system, and are exported with subsidies financed by producer levies. Fruits and vegetables are Canada's main agricultural imports from Mexico and are subject to substantial tariffs.

The United States has become an increasingly important market for Canada, and takes over a third of Canada's agricultural exports. As Canada's crop exports have been buffeted by low world prices and bad weather, exports of animal products and other high valued products have increased. Most of these products go to the U.S.: Animal product exports – mainly live animals, pork, and beef – account for about 40% of Canada's exports to the U.S. (Table 1). For example, the value of Canada's exports fell 15 percent in 1989 as drought reduced export subsidies. Yet agricultural exports to the U.S. rose almost 13 percent.

Table 1--Canadian agricultural trade

Item	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
					Million Canadian dollars					
Agricultural exports	7,786	8,783	9,304	9,505	10,307	8,882	8,401	8,886	10,393	8,834
Share to U.S. (%)	14.3	14.3	17.3	18.2	21.7	27.3	31.7	32.1	31.0	36.0
Agricultural imports	5,128	5,614	5,056	5,185	6,111	6,018	6,607	6,767	6,934	7,113
Share from U.S. (%)	56.9	58.1	60.6	60.1	59.1	57.0	55.1	57.5	56.3	58.9
Agr. trade balance	2,658	3,169	4,248	4,320	4,196	2,864	1,794	2,119	3,459	1,721
With U.S.	(1,830)	(2,061)	(1,514)	(1,442)	(1,441)	(1,081)	(1,060)	(1,133)	(832)	(729)
Agr. exports as share of total exports (%)	10.5	10.8	11.4	10.7	9.4	7.7	7.2	7.3	7.8	6.6

Source: Agricultural Canada.

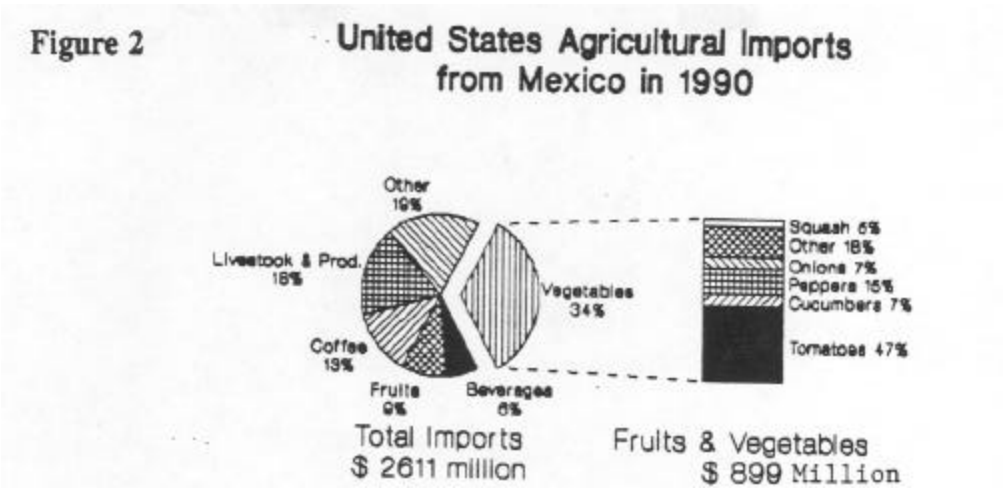
U.S. Mexican Agricultural Trade

U.S. agricultural imports from Mexico rose fairly steadily throughout the 1980's, starting at about $1.1 billion in the early 1980's reaching a record $2.6 billion in 1990. U.S. imports of horticultural products from Mexico have registered the most rapid increase, rising from $500 million in the early 1980's to a record $1.6 billion in 1989.

Mexican exports of horticultural products represent about 60% of total agricultural exports to the U.S. In recent years, Mexico has also become an important U.S. supplier of processed foods, including tomato paste and beverages such as fruit juices and beer.

The major agricultural imports from Mexico in 1990 were: fresh vegetables ($804 million), live cattle ($420 million), coffee ($328 million), fresh non-citrus fruits ($121 million), and fresh melons ($88 million) (Figure 2).

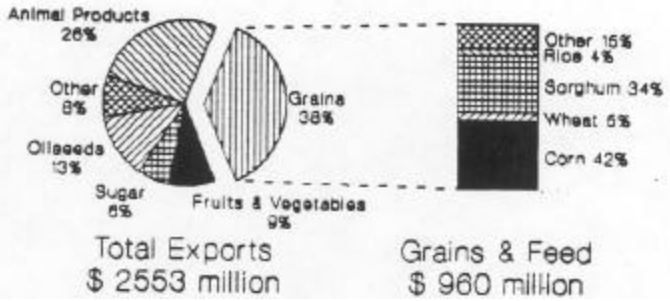
Figure 2 United States Agricultural Imports from Mexico in 1990



U.S. agricultural exports to Mexico varied fairly dramatically during the 1980's falling from about $2.5 billion in the early 1980's to $1.0 - $1.2 billion in 1986-87, before rising to a record level of $2.7 billion in 1989. Grains have typically been the largest export items. Dairy, livestock and poultry products have showed the most rapid growth, rising from less than $300 million in 1980 to about $800 million annually during the 1988-90 period. U.S. exports of horticultural products rose to a record $162 million in 1990 more than triple the amount exported in 1987.

The major agricultural exports to Mexico in 1990 were: corn ($400 million), grain sorghum ($328 million), soybeans and by-products ($265 million), sugar ($118 million), dried beans ($100 million), seeds ($87 million), beef and veal ($81 million), animal fats and oils ($79 million), cattle hides ($75 million), dairy products ($62 million), poultry meat ($56 million), live cattle ($55 million), and wheat ($51 million) (Figure 3).

Figure 3 United States Agricultural Exports to Mexico in 1990



U.S. Canadian Agricultural Trade

Canada's agricultural imports grew faster than agricultural exports in the 1980's, resulting in a shrinking trade surplus since 1983 (Tables 2 and 3). The U.S. is by far Canada's dominant supplier of agricultural imports, although its share of total imports in the 1980's remained constant at between 55-60 percent. Fruits, vegetables, and related products account for about half of Canada's imports from the U.S. In the mid-1980's when Canada's dollar was weak relative to the U.S. dollar, Canadian importers looked to other (non-U.S.) suppliers for horticultural products – for example, Chilean grapes and New Zealand apples. But U.S. fruit and vegetable exports to Canada have continued to rise in the 1980's. In 1989, the U.S. accounted for 91 percent of Canada's fresh vegetable imports and 74 percent of fresh fruit imports, down slightly from the 1980's.

Table 2--Canada's agricultural imports from the United States

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
					1,000 Canadian dollars					
Grains and feeds	355,521	400,840	326,065	292,018	381,451	346,584	353,749	339,004	417,069	513,885
Oilseeds and products	399,032	375,353	385,906	388,948	475,035	388,458	387,852	396,356	371,127	380,638
Animals and products	436,163	570,528	475,092	505,955	563,612	578,292	645,625	761,214	722,699	798,836
Fruits and nuts	648,088	735,241	773,599	741,814	842,447	811,443	875,137	914,233	971,299	964,039
Vegetables and products	382,896	493,666	494,936	518,609	581,333	575,809	648,385	714,636	711,659	775,938
Cotton and tobacco	150,981	131,998	85,058	120,719	130,355	82,257	26,152	57,608	78,060	80,934
Refined sugar	41,767	37,271	15,293	22,598	31,683	38,903	55,535	61,740	85,562	84,015
Other vegetable products 1/	322,982	293,518	273,167	278,878	322,787	331,214	355,697	335,834	282,619	281,557
Other agricultural products	223,609	283,000	291,169	309,025	348,620	355,028	372,295	400,520	282,000	309,852
TOTAL IMPORTS	2,961,039	3,321,415	3,120,285	3,178,564	3,677,323	3,507,988	3,720,427	3,981,145	3,902,294	4,189,694
Alcoholic beverages	NA	NA	NA	NA	29,935	61,193	32,182	41,335	55,283	89,172

1/ Includes seeds for sowing, plantation crops, and floriculture and nursery products. Source: Statistics Canada

Table 3--Canada's agricultural exports to the United States

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988 2/	1989 3/
					1,000 Canadian dollars					
Grains and feeds	206,315	209,707	261,597	287,061	327,406	357,442	397,364	449,078	503,000	662,652
Oilseeds and products	36,441	91,903	57,752	84,786	94,343	113,169	105,480	118,818	213,000	302,713
Animals and products	592,802	602,042	828,325	814,767	1,128,061	1,189,013	1,169,139	1,293,447	1,359,000	1,462,302
Fruits and nuts	40,937	46,768	65,045	65,411	68,857	77,298	96,955	103,609	102,000	74,230
Vegetables and products	58,204	88,566	101,944	117,288	132,908	144,188	152,466	171,636	166,000	245,610
Tobacco and vegetable fibers	20,592	32,820	52,635	46,343	43,086	54,263	62,592	69,930	55,000	28,336
Sugar and maple products	14,137	17,020	43,226	54,997	59,902	55,509	87,968	68,561	50,000	137,935
Other vegetable products 1/	22,377	29,404	41,024	59,706	71,222	80,035	176,342	184,812	129,000	159,818
Other agricultural products	139,297	141,955	154,564	208,072	310,407	356,004	411,927	388,341	493,000	386,998
TOTAL EXPORTS	1,131,102	1,260,185	1,606,112	1,736,431	2,235,992	2,426,921	2,660,333	2,848,232	3,070,000	3,460,594
Alcoholic beverages	NA	NA	NA	NA	531,963	524,486	505,795	513,352	498,280	483,583

1/ Includes seeds for sowing and plantation crops. 2/ Estimated from Agriculture Canada preliminary data, reported in the 1990 Annual Agricultural Situation report, FAS/Ottawa. 3/ Estimated from U.S. import data.
Source: Statistics Canada; Agriculture Canada; FATUS, ERS/USDA.

The U.S.-Canada Free Trade Agreement (FTA) went into effect on January 1, 1989. Tariffs on some agricultural products have come down 30 percent as of January 1, 1991. Tariffs on some agricultural products have already fallen to zero under the accelerated tariff reduction provisions. The tariff snapback provision was used for the first time in May 1990. Canada reduced its on asparagus from 15 to 12 percent for 2 weeks. Under this provision, for a period of 20 years, tariffs on fresh fruits and vegetables will be allowed to "snap back" to the previous Most Favored Nation level if: 1) for 5 consecutive days the import price is below 90 percent of the average monthly import price over the past 5 years, excluding the high and low years; and 2) planted acreage in the importing country is not higher than the previous 5-year average, again excluding the high and low years.

The grain support calculations under Article 705 resulted in Canada removing its import license on oats in 1989, giving U.S. exports free access to Canada. The calculations for the 1988/89 and 1989/90 will be announced in May 1991.

Canadian-Mexican Agricultural Trade

Two-way trade between Canada and Mexico for all products was only $2 billion in 1989, compared with $52 billion for U.S.-Mexican trade. Canada was a net importer with exports of $524 million and imports of $1.4 billion. About a fourth of Canada's exports to Mexico in 1989 were agricultural, but less than 10 percent of Canada's imports from Mexico were agricultural products.

Canadian-Mexican agricultural trade is small compared with U.S.-Canadian agricultural trade and variable, reflecting Mexico's unstable external financial situation. Canadian agricultural exports to Mexico in 1989 were only $127 million and agricultural imports from Mexico equaled just $104 million (Tables 4 and 5). Except for 1986, Canada was a net exporter during the 1980's. Canada's main agricultural products are wheat, canola, and dairy products. Imports from Mexico are more diverse and include tomatoes, peppers, cucumbers, frozen strawberries, melons, coffee, cotton, beer, and other alcoholic beverages.

Table 4--Canada's agricultural exports to Mexico

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
					1,000 U.S. dollars					
Live animals	7,792	8,628	4,899	607	10,567	16,456	3,235	2,189	5,803	8,540
Meats	1,159	2,776	2,313	386	2,180	3,377	1,956	2,981	7,620	14,969
Dairy products	44,844	84,248	57,013	1,707	17,865	25,668	19,037	11,541	34,184	39,094
Nonfat dry milk	23,702	54,213	44,960	1,690	17,604	25,645	19,024	11,520	34,123	38,623
Grains	21,933	10,318	10,400	71,971	10,363	2,975	12,595	16,700	30,944	2,362
Wheat	21,232	10,019	10,376	61,772	0	0	11,311	16,493	30,089	0
Oilseeds and products	7,569	18,282	216	107	28,402	13,273	26,580	68,575	45,376	50,342
Other products	5,744	39,020	12,060	6,384	10,556	19,394	10,128	11,882	4,655	12,412
TOTAL EXPORTS	89,041	163,272	86,901	81,162	79,933	81,143	73,531	113,868	128,582	127,719

Source: U.N. trade data, Statistics Canada.

Table 5--Canada's agricultural imports from Mexico

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
					1,000 U.S. dollars					
Fruits, nuts, veg.	37,876	49,228	39,207	40,711	34,269	37,013	38,002	42,959	57,471	66,351
Fresh fruit, nuts	9,714	7,070	7,532	8,520	6,582	7,472	8,845	11,497	18,487	21,724
Fresh vegetables	18,256	29,401	19,392	22,946	21,759	25,250	21,784	21,091	18,686	24,180
Tomatoes	7,423	17,474	7,942	10,278	9,092	11,757	8,168	7,222	7,422	8,512
Coffee	19,097	15,726	17,498	11,927	19,770	20,386	30,164	27,118	24,574	22,469
Cotton	6,199	7,337	4,503	6,292	4,675	2,645	1,441	0	80	78
Beverages and tobacco	4,941	4,911	4,407	5,440	6,533	6,596	6,642	7,780	10,232	12,943
Other products	15,467	13,317	8,014	10,024	4,102	6,725	7,102	5,372	4,832	2,900
TOTAL IMPORTS	83,580	90,519	73,629	74,394	69,349	73,365	83,351	83,229	97,189	104,741

1/ Includes alcoholic beverages. Source: U.N. trade data, Statistics Canada.

3. Barriers to Trade Between Mexico and the United States

Barriers to trade for both Mexico and the United States will be discussed. Since details about U.S. barriers to agricultural trade have appeared in publications of the OECD and the Economic Research Service for the USDA, more border measures, such as tariffs and import quotas, and non-border policies will be discussed, but only the border measures will be used in the simulation of the FTA.

Mexican Barriers to Trade

Mexico's agricultural policies have had two objectives: to boost the incomes of small farmers through increased agricultural output and to provide low-cost food to the low-income, largely urban, consumers. The main programs implemented to achieve the first goal have included price supports, fiscal support, input subsidies, general marketing subsidies, and control of foreign trade to protect domestic output from imports. The second goal has been pursued through price controls, subsidies on basic products, and a government distribution system for basic food commodities.

Government intervention in procurement, marketing and consumption has been extensive. Before 1990, the Mexican government intervened in virtually all phases of the agricultural sector including: production of grains, food processing, storage, domestic purchasing, import purchasing, regulation and price controls, provision of financial services, producer subsidies, and food industry subsidies.

Historically, consumer and producer prices for major agricultural products have been influenced by government procurement from producers at guarantee prices, export and import controls, direct consumer price controls, and direct subsidies to private and parastatal processors. Several different parastatals, not always coordinated, were in charge of providing subsidies.

As part of the economic reform process, the government has moved toward more market-oriented price policies, with less government intervention in the procurement, marketing and consumption of food products. The principal agricultural policy reforms have sought to reduce government intervention by replacing producer supports with a new system, known as "agreement prices" intended to facilitate gradual movement toward market pricing; eliminating price controls for certain products; reducing tariff protection, reducing untargeted domestic producer subsidies for inputs (credit, fertilizer, electricity and irrigation water), and increasing targeted consumer subsidies.

In addition, in an effort to reduce fiscal transfers, since 1988 the Mexican government has been restructuring or privatizing the various parastatals through a process of mergers, liquidation, and sales. More significantly, the recent divestiture program has targeted some of the biggest enterprises in the public sector. In particular, the National Company of Subsistence Commodities (CONASUPO) was divested of its vegetable oil-crushing plants, processing affiliates and retail operations in urban areas, and most of the parastatals under SARH control, including ALBAMEX (balanced feed), FERTIMEX (fertilizers), were privatized.

Background

Historically, the principal policies affecting Mexican producers of basic agricultural commodities have included: (1) a price support program, managed by CONASUPO, guaranteeing the purchase of domestic crops at a fixed minimum price which has generally exceeded the world market price; (2) input subsidies for credit, insurance, fertilizer, pesticides, irrigation water, and electricity; (3) general marketing subsidies provided by CONASUPO; (4) fiscal support; (5) direct subsidies on basic agricultural products; (6) import license requirements and tariffs; and (7) a misaligned official exchange rate for the peso.

Each of these policies has been provided through specific instruments, and with the intervention of several government institutions. Table 6 presents a description of the principal policies affecting Mexican producers of basic agricultural commodities and the main government institutions intervening in the provision of these subsidies.

Mexico's policy intervention in agriculture was estimated in the form of producer subsidy equivalents (PSE's). PSE's are defined as the amount required to compensate producers for the removal of government intervention.

The PSE's measured in this section include policies that affect producer prices, production input subsidies (credit, crop insurance, irrigation and fertilizer price), and exchange rate distortions.

TABLE 6 -MEXICO'S INTERNAL AGRICULTURAL SUPPORT PROGRAMS

SUBSIDIES	POLICY INSTRUMENTS	INTERVENING INSTITUTIONS
PRICES	Price support programs of guaranteed and agreement prices, guaranteeing the purchase of domestic crops at a fixed minimum price which has generally exceeded the world market price.	SARH, Agricultural Cabinet, SECOFI.
CREDIT	Agricultural credit for basic products at preferential rates, below market rates through: ♦ BANRURAL ♦ FIRA ♦ FICART Crop and livestock insurance through: ♦ ANAGSA (AGROASEMEX)	BANRURAL, FIRA, FICART, Commercial Banks, ANAGSA (AGROASEMEX), SHCP.
INPUTS	Provision of inputs for production at prices below market levels for: ♦ Water for irrigation ♦ Electricity for pumping water ♦ Fertilizers ♦ Pesticides ♦ Seeds ♦ Marketing and transportation ♦ Fuel	SARH, CONAGUA, FERTIMEX, FERRONALES, SCT, SHCP, PEMEX, PRONASE, SEMIP
FISCAL TRANSFERS	Fiscal transfers from the Federal Government to producers, through such programs as: ♦ CEPROFIS ♦ Technical assistance ♦ Phytosanitary control ♦ Research and development ♦ Construction of infrastructure	SARH, SPP

The commodities covered in this exercise represent seven major crops (wheat, corn, sorghum, dry beans, sesame seed, and cotton), and five major livestock products (beef, pork, poultry, eggs and milk). All these commodities are included in the SWOPSIM estimation. Other commodities included in the SWOPSIM, but not in the PSE's calculation due to insufficient data are soymeal, soyoil, butter, cheese and milk powder.

The impacts of agricultural policies throughout the 1982-89 period include:

- During the 1982-89 period, producers of major crops systematically received a higher level of subsidies than livestock producers through price supports, low-priced inputs, and preferential credits. Subsidies to crop producers made up 45 percent of the value of crop output as measured by the PSE's for the 1982-89 period. By comparison, livestock producers received lower subsidies during the same period, and, in some years, were taxed through relatively low domestic prices.

- Of the basic commodities, corn, soybeans, sorghum, and dry beans received more support than wheat. Corn and dry beans attracted large subsidies because of its importance to small farmers. Soybeans and sorghum production were heavily subsidized in an import substitution effort. Wheat, produced by large-scale commercial farmers, have traditionally received relatively little support.

- For corn, the average 1982-89 PSE was 55 percent of producer value. For soybeans, it was 48 percent of producer value, for sorghum, 44 percent, and for dry beans, 38 percent. For wheat, the average 1982-89 PSE was 26 percent of producer value.

- For corn, soybeans, and sorghum, price supports and import licensing accounted for the bulk of the subsidy. In the case of dry beans and corn, farm credit subsidies were very important to production because *ejidatarios* (small communal landholders) cannot offer their land as collateral for short-term loans from private institutions. For wheat, the irrigation subsidy accounted for most of the support. Also, the marketing subsidies provided by CONASUPO were important to the maintenance of the price support programs and to an adequate supply of agricultural products in the principal urban centers.

- Comparatively, the exported crops (sesame seed and cotton) received less protection than the basic commodities. For sesame seed, the average 1982-89 PSE was 19 percent of producer value. For cotton, it was 15 percent of producer value. For sesame seed, farm credit represented the bulk of the subsidy. In the case of cotton, the exchange rate adjustment and the irrigation subsidy accounted for most of the support.

- Of the basic livestock products, poultry and pork received more support than beef, eggs, and milk.

- For poultry, the average 1982-89 PSE was 25 percent of producer value, and for pork, 18 percent. For eggs, the average 1982-89 PSE was –20 percent of producer value, for beef, -15 percent, and for milk, -2 percent. For poultry and pork, price supports and import licensing accounted for the bulk of the subsidy. For beef and eggs, the exchange rate adjustment accounted for most of the support. For milk, the balanced feed subsidies and fiscal transfers accounted for most of the subsidy.

- Mexico consistently undervalued its currency during 1982-87, providing an implicit subsidy to its producers that averaged approximately 8 percent of the value of crop production and livestock products each year.

- As part of the economic stabilization reforms initiated in 1988, and Mexico's broad program to liberalize its economy, the Government has sharply reduced tariff rates and import licensing requirements, and also reduced untargeted subsidies to crops and livestock producers (credit, insurance, fertilizer, electricity, irrigation, and balanced feed subsidies).

- Policies affecting consumers include the same border measures and price supports that affect producers, as well as direct consumer subsidies.

- During the 1982-89 period, direct CONASUPO's subsidies to the food industry were highly concentrated in wheat milling (19 percent of consumer value), corn processing (14 percent of consumer value), and dry beans (8 percent of consumer value). For the soybean oil crushing plants, the average CSE was 9 percent of consumer value, and for sorghum, less than 1 percent. In the case of corn, CONASUPO's consumer subsidies to low-income consumers averaged 6 percent of the value to consumers during the 1982-89 period.

- CONASUPO's consumer subsidies to millers and low-income consumers have declined substantially since 1987. Subsidies to the oilseeds and sorghum industries were eliminated in 1985. Since 1987, consumers of wheat, corn, sorghum, soybeans, pork and poultry have been taxed through the effect of border controls increasing the price wedge between domestic and international prices, while consumers of dry beans, beef and milk have received subsidies, quite substantial as in the case of milk.

Table 7 (and Figure 4-A & 4-B) presents the individual commodity PSE's expressed as a percentage of the value of production. PSE's can be positive (indicating a subsidy) or negative (indicating a tax), depending on government policy objectives (Figure 5-A & 5-B). Tables 8 and 9 present the total estimated subsidies for the crop and livestock sectors by type of policy, expressed in millions of dollars. The base year for exchange rate adjustment is 1977.

Price Policy and Border Controls

From the early 1950's until 1989, the Agricultural Cabinet[1] set uniform nationwide support (guaranteed) prices for all major crops (corn, dry beans, wheat, rice, soybeans, copra, malting barley, sorghum, sesame, sunflower, cottonseed, and safflower). The guaranteed price was supported by CONASUPO through farmgate purchases of major crops.

[1] The Agricultural Cabinet is a committee presided by the President, with members from the Ministry of Agriculture (SARH), Commerce (SECOFI), Finance (SHCP), Planning and Budgeting Office (SPP), Agrarian Reform (SRA), the Controller General and two permanent invites, the Directors of CONASUPO and BANRURAL.

TABLE 7 - MEXICAN PRODUCER SUBSIDY EQUIVALENTS BY COMMODITY

PERCENT

	1982	1983	1984	1985	1986	1987	1988	1989	1982-89
WHEAT									
♦ Border Controls and Price Supports	-28.65	-30.88	7.70	16.71	-7.73	-4.01	6.32	4.16	-4.55
♦ Input Subsidies	35.74	37.79	25.90	27.25	35.99	31.25	26.83	24.32	30.63
♦ Exchange Rate Adjustment	22.57	25.90	1.92	2.47	26.85	23.08	0.39	-0.97	12.78
♦ Total Transfers	29.66	32.81	35.52	46.43	55.11	50.31	33.54	27.51	38.86
♦ Total Transfers (w/o Exchange Rate)	7.09	6.91	33.60	43.96	28.26	27.24	33.15	28.48	26.09
CORN									
♦ Border Controls and Price Supports	31.72	11.65	31.03	44.24	37.80	54.45	35.21	32.58	34.83
♦ Input Subsidies	36.82	19.60	16.42	16.23	22.00	16.89	19.92	14.11	20.25
♦ Exchange Rate Adjustment	11.22	15.78	1.26	1.47	14.28	9.59	0.24	-0.58	6.66
♦ Total Transfers	79.76	47.03	48.70	61.94	74.08	80.93	55.37	46.11	61.74
♦ Total Transfers (w/o Exchange Rate)	68.54	31.25	47.45	60.47	59.80	71.34	55.13	46.69	55.08
SORGHUM									
♦ Border Controls and Price Supports	1.59	-34.63	23.23	28.01	45.42	33.37	35.00	25.70	19.71
♦ Input Subsidies	31.00	36.89	24.36	22.06	23.82	20.69	16.37	17.82	24.13
♦ Exchange Rate Adjustment	17.17	25.13	1.57	2.08	15.19	14.15	0.26	-0.68	9.36
♦ Total Transfers	49.75	27.39	49.15	52.16	84.44	68.20	51.63	42.84	53.20
♦ Total Transfers (w/o Exchange Rate)	32.59	2.26	47.58	50.07	69.24	54.05	51.37	43.52	43.84
SOYBEANS									
♦ Border Controls and Price Supports	6.58	-6.25	20.76	35.43	22.07	40.33	13.65	35.57	21.05
♦ Input Subsidies	37.11	35.30	24.54	25.05	26.86	22.50	21.96	18.35	26.46
♦ Exchange Rate Adjustment	14.61	18.55	1.41	1.66	17.23	12.21	0.31	-0.58	8.17
♦ Total Transfers	58.57	47.60	46.71	62.14	66.16	75.05	35.92	53.33	55.68
♦ Total Transfers (w/o Exchange Rate)	43.96	29.05	45.30	60.48	48.93	62.84	35.61	53.92	47.51
BEEF									
♦ Border Controls and Price Supports	-24.25	-33.57	-15.80	-21.56	-22.61	-16.74	-4.66	-4.61	-17.98
♦ Input Subsidies	3.29	6.67	6.34	4.64	2.19	1.58	1.71	0.32	3.34
♦ Exchange Rate Adjustment	19.84	24.08	2.06	3.00	26.92	22.69	0.38	-0.92	12.26
♦ Total Transfers	-1.12	-2.83	-7.41	-13.92	6.49	7.53	-2.57	-5.21	-2.38
♦ Total Transfers (w/o Exchange Rate)	-20.96	-26.91	-9.46	-16.92	-20.43	-15.17	-2.95	-4.29	-14.64
PORK									
♦ Border Controls and Price Supports	-4.36	-13.29	11.70	17.06	10.12	26.07	44.56	36.55	16.05
♦ Input Subsidies	1.86	6.24	2.68	0.56	1.29	0.66	1.01	0.19	1.81
♦ Exchange Rate Adjustment	18.46	22.39	1.78	2.36	22.41	16.94	0.25	-0.68	10.49
♦ Total Transfers	15.97	15.34	16.16	19.97	33.82	43.67	45.83	36.07	28.35
♦ Total Transfers (w/o Exchange Rate)	-2.49	-7.05	14.38	17.61	11.41	26.73	45.58	36.75	17.87
POULTRY									
♦ Border Controls and Price Supports	30.84	20.72	27.10	30.99	9.09	7.17	26.28	22.54	21.84
♦ Input Subsidies	3.03	9.73	4.72	0.15	1.38	0.96	2.19	0.25	2.80
♦ Exchange Rate Adjustment	11.06	14.21	1.29	1.70	19.63	17.70	0.26	-0.67	8.15
♦ Total Transfers	44.93	44.66	33.11	32.85	30.09	25.83	28.73	22.12	32.79
♦ Total Transfers (w/o Exchange Rate)	33.87	30.45	31.82	31.15	10.46	8.13	28.47	22.79	24.64
MILK									
♦ Border Controls and Price Supports	-4.99	-5.10	-2.59	-2.09	-3.23	-3.82	-6.12	-6.53	-4.31
♦ Input Subsidies	2.61	7.86	3.73	0.71	1.91	1.34	2.80	0.36	2.66
♦ Exchange Rate Adjustment	0.74	0.85	0.04	0.05	0.66	0.69	0.02	-0.05	0.37
♦ Total Transfers	-1.65	3.61	1.18	-1.33	-0.66	-1.79	-3.30	-6.23	-1.27
♦ Total Transfers (w/o Exchange Rate)	-2.38	2.76	1.13	-1.38	-1.33	-2.48	-3.33	-6.18	-1.65

Figure 4-A

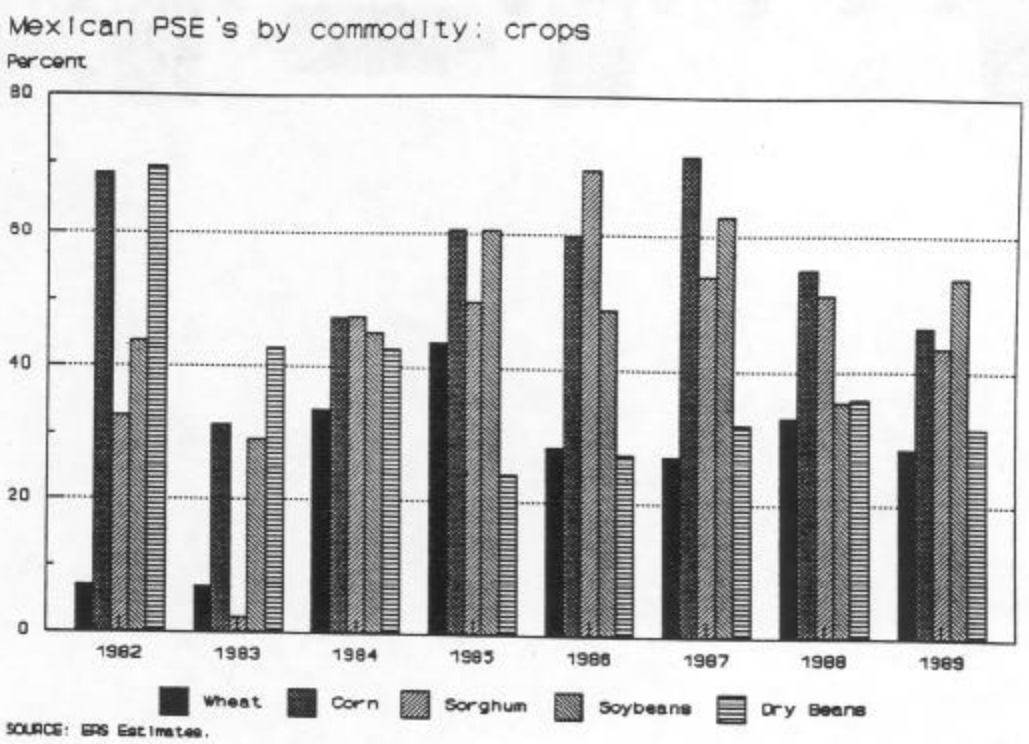


Figure 4-B

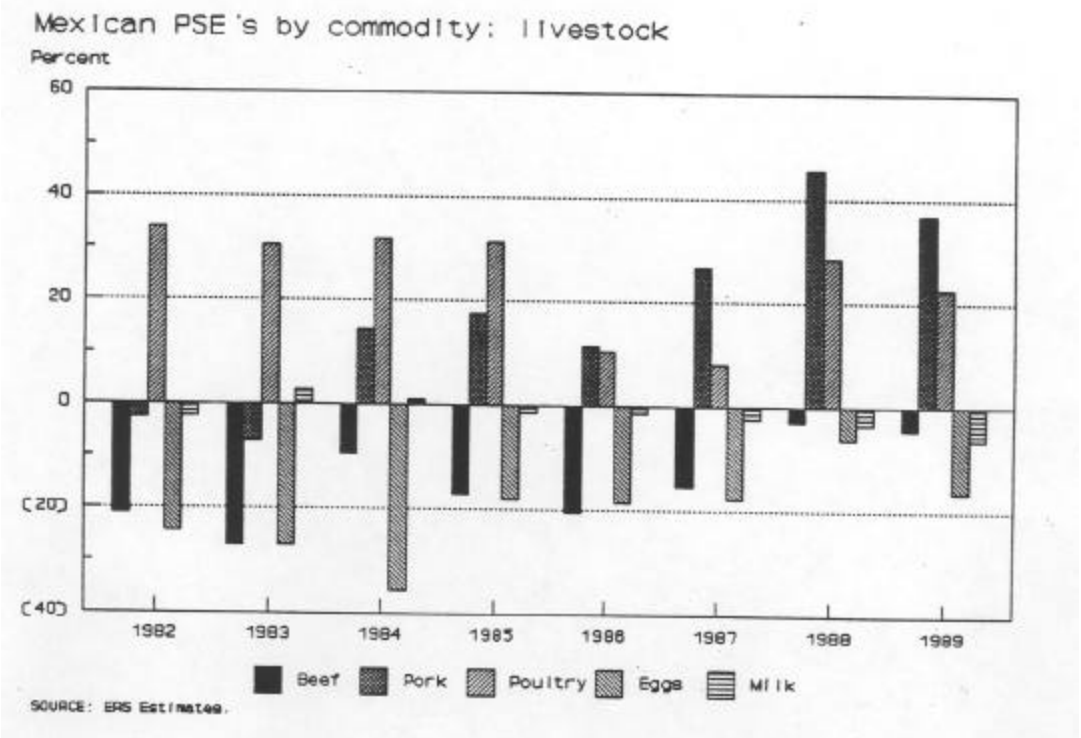


TABLE 8 - TOTAL SUBSIDIES TO THE CROP SECTOR IN MEXICO, BY TYPE OF POLICY[1]
MILLIONS OF U.S. DOLLARS

	1982	1983	1984	1985	1986	1987	1988	1989
PRICE POLICY	430	-65	1,100	1,779	1,003	1,453	1,022	994
CREDIT SUBSIDY	817	476	494	523	422	365	377	176
INSURANCE SUBSIDY	171	172	184	172	138	72	96	144
IRRIGATION SUBSIDY	243	183	187	239	166	208	235	313
FERTILIZER SUBSIDY	163	207	168	178	186	191	134	128
EXCHANGE RATE ADJUSTMENT	554	752	75	105	646	566	12	-30
TOTAL TRANSFERS	2,378	1,725	2,207	2,995	2,563	2,855	1,874	1,723
TOTAL TRANSFERS (w/o Exchange Rate)	1,824	973	2,133	2,890	1,916	2,289	1,863	1,753
CROP SECTOR GDP	7,428	6,912	9,102	10,199	7,872	8,057	8,422	n.a.
PERCENT	24.56%	14.07%	23.43%	28.33%	24.34%	28.41%	22.12%	n.a.

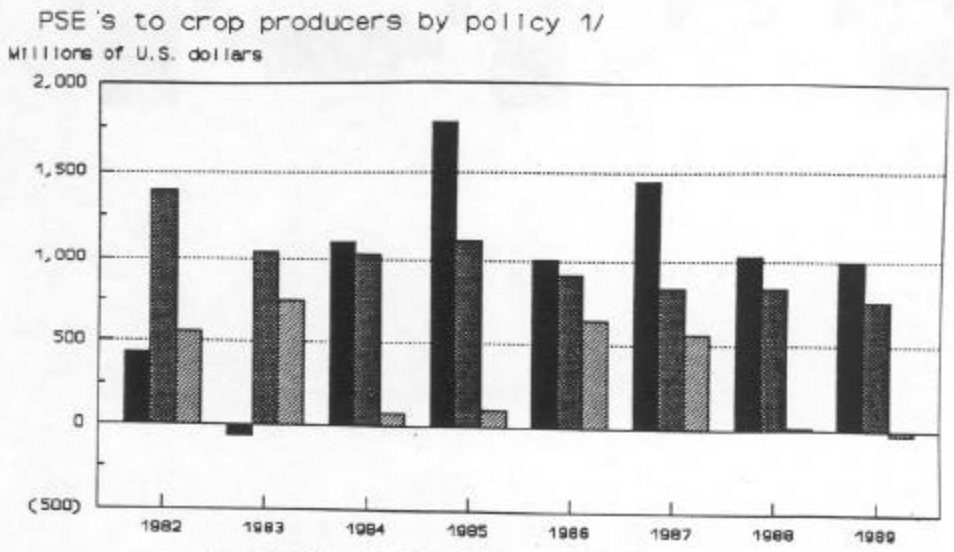
TABLE 9 - TOTAL SUBSIDIES TO THE LIVESTOCK SECTOR IN MEXICO, BY TYPE OF POLICY[2]
MILLIONS OF U.S. DOLLARS

	1982	1983	1984	1985	1986	1987	1988	1989
PRICE POLICY	-674	-976	-126	137	-454	-104	874	352
CREDIT SUBSIDY	79	96	124	103	52	45	42	10
BALANCED FEED SUBSIDY	133	387	228	-4	59	31	119	12
FISCAL TRANSFERS SUBSIDY	0	0	0	6	5	5	4	3
EXCHANGE RATE ADJUSTMENT	1,060	1,020	107	135	1,157	1,073	21	-50
TOTAL TRANSFERS	598	527	333	377	818	1,049	1,061	326
TOTAL TRANSFERS (w/o Exchange Rate)	-462	-493	226	242	-339	-24	1,040	376
LIVESTOCK SECTOR GDP	3,894	3,585	4,694	4,988	3,248	3,144	3,908	n.a.
PERCENT	-11.86%	-13.75%	4.82%	4.85%	-10.43%	-0.75%	26.60%	n.a.

[1]Includes wheat, corn, sorghum, soybeans, dry beans, sesame seed, and cotton.

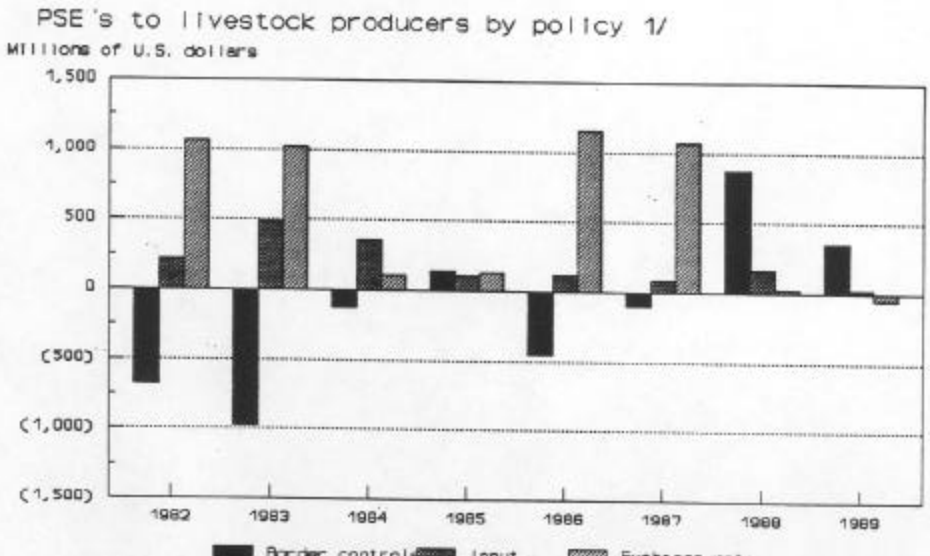
[2]Includes beef, pork, poultry, eggs, and milk.

Figure 5-A



SOURCE: ERS Estimates.
1/ Includes wheat, corn, sorghum, soybeans, dry beans, sesameseed, and cotton.

Figure 5-B



SOURCE: ERS Estimates.
1/ Includes beef, pork, poultry, eggs, and milk.

In 1989, the government eliminated the price guarantee program for all primary commodities except corn and dry beans. Given the economic and social importance of these commodities, the GOM determined that they should continue to have a guaranteed price.

Basic crops other than corn and dry beans are now subject to a new system known as "agreement prices." This new system intended to facilitate gradual movement toward market pricing, is based on a compromise between the government, producers, distributors and processors (consumers). Under this scheme, CONASUPO is no longer obligated to buy all domestic production, but private traders are required to purchase the entire domestic crop at the agreement price before any import takes place. Currently, wheat, soybeans, sorghum, barley, oats, and rice are under the agreement pricing system. The agreement price is set on the basis of the international price (Chicago Board of Trade spot price for grains and oilseeds) and the marketing costs established by the Mexican Government. These costs differ across products, but in general, include the cost of freight insurance, taxes, transportation and storage costs.

Figure 6

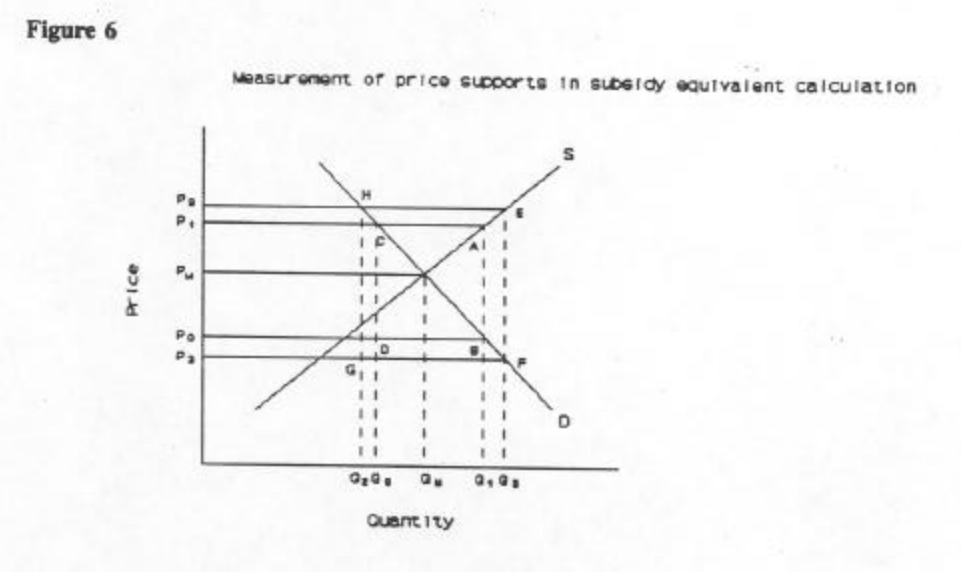
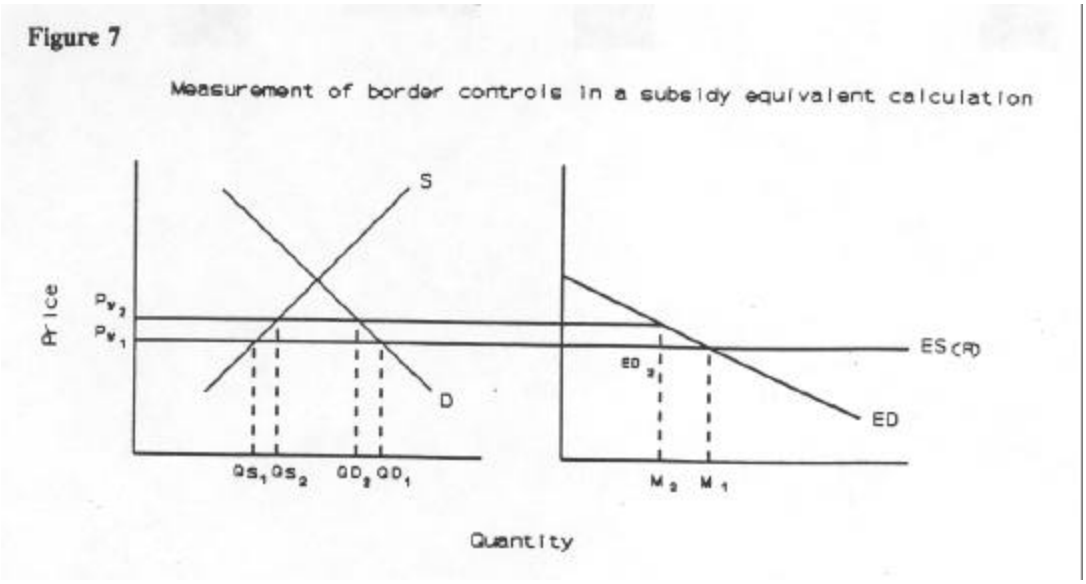


Figure 6 depicts the logic of a government price support. S is the supply curve reflecting increasing costs faced by producers rising production in the short-run. D, the demand for agricultural output. With no government intervention and no imports Q_M and P_M are the market quantity and price respectively. Under the assumption of a one-period situation in which all government purchases have to be sold during the same period, in order to increase output to Q_1, the government has to buy the crop at the support price P_1, and sell it at price P_0, at a unit subsidy of P_0P_1. The total government cost of the price subsidy is P_0P_1AB. A further increase in the price support to P_2 will raise the government cost of the price subsidy to P_3P_2EF.

Figure 7 illustrates how the contribution of Mexico's import licensing requirement would be estimated in a PSE. The world price P_{W1} is below the intersection of domestic supply S and demand D, so that imports will be M_1, in a free market where the world price prevails. Mexico's

import licensing requirement is in effect a quota, making Mexico's excess demand curve ED_2 perfectly inelastic at the quantity M_2, reduced imports to M_2 instead of M_1.



Input Subsidies

The government has long employed input subsidies to stimulate agricultural production, principally, credit, crop insurance, fertilizer, pesticides, improved seeds, irrigation water, electricity, and fuel. As part of the agricultural policy reform the government has been reducing untargeted subsidies for producers. Based on PSE's estimations, input subsidies averaged 23 percent of the value of livestock products each year during 1982-89. Input subsidies represented over one-third of the gross value of production for basic crops in 1982 had come to represent only 17 percent of the value of crop production by 1989.

Credit. Historically, the bulk of the financing to the agricultural sector (about 94 percent) has been channeled through BANRURAL, FIRA (agricultural trust fund in Bank of Mexico), and the Commercial Banks, which would provide working capital loans of up to one year. Medium-term credit was provided by FICART (agricultural trust fund in the Finance Ministry, SHCP).

Financial institutions channeled their loans to producers of different types: low, middle and high-income producers. Interest rates on loans to farmers were set below commercial lending rates and varied according to income, type of producer and product. Most of the portfolio of BANRURAL and FICART was lent to low-income producers, while FIRA's portfolio was divided between middle and high income producers. Commercial banks distribute their portfolios between the three types of producers.

During the 1982-89 period, credit subsidies channeled through these institutions represented 11 percent of the value of crop production, and less than 1 percent of the value of livestock production. During this period, over one-half of the credit subsidy went to corn production, and the rest to dry beans (17%), sorghum (16%), wheat (10%), soybeans (4%), cotton (2%) and sesameseed (1%).

As part of the economic reform program, credit subsidies have been reduced and BANRURAL, FIRA, FICART are being restructured. All interest rate controls were removed April 1989 and it was established that BANRURAL could no longer serve high income farmers or sustain insolvent producers, financing only "low-income farmers with high economic potential." BANRURAL, FIRA and FEGA now provide subsidized credit only to *ejidatarios* and small farmers, while commercial farmers previously serviced by BANRURAL are serviced by commercial banks. FIRA and BANCOMEXT also can provide dollar credits under competitive conditions to export agriculture.

Crop Insurance. Until 1990, all BANRURAL borrowers were obliged to get crop and livestock insurance through ANAGSA the government insurance company. ANAGSA was disincorporated in February 1990 and replaced by AGROASEMEX, a mixed (public and private sector) insurance firm to insure crops of only viable farmers on the basis of productivity and low risk. Insurance is now voluntary and based on non-subsidized premiums.

During the 1982-89 period insurance subsidies through ANAGSA had represented a little over 3 percent of the gross value of production in the crop sector. In 1989, the last year of operation, the insurance subsidy was distributed among corn (50%), dry beans (17%), sorghum (16%), wheat (10%), soybeans (4%), cotton (2%), and sesameseed (1%).

Fertilizer. The government has controlled production, imports, distribution and exports of agrochemicals, and provided fertilizer at subsidized prices through FERTIMEX. Fertilizer subsidies represented about 4 percent of the value of crop production during 1982-89. Domestic prices of fertilizers were increased in the past two years aligning them with international prices. FERTIMEX has been disincorporated.

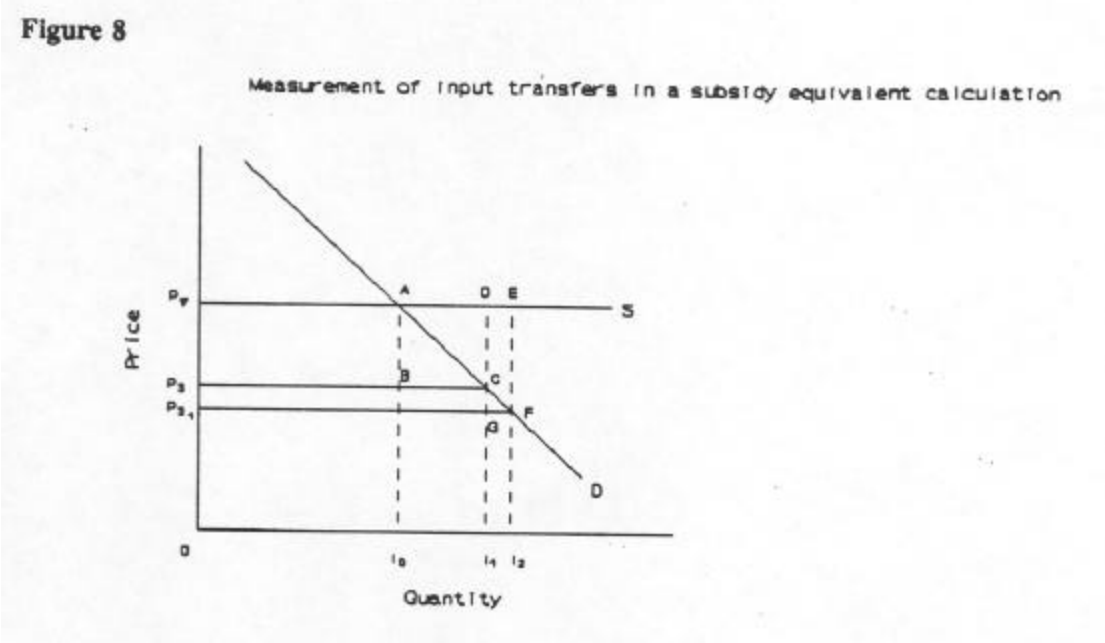
Seeds. PRONASE, a parastatal under the Ministry of Agriculture (SARH) control, regulates the seed market, and provides certified seeds at subsidized prices. This enterprise is being restructured to provide certified seeds at market prices.

Irrigation. Subsidies for irrigation originate in subsidies on water provided through surface irrigation systems, and electricity subsidies for pumping ground water. The surface water subsidy is represented by the operational deficit of the irrigation districts, while the electricity subsidy is represented by a below-cost rate for electricity used for pumping of water, by the Federal Electricity Commission. Irrigation subsidies during the 1982-89 period were high, particularly for wheat and soybeans. Throughout the 1982-89 period, irrigation subsidies represented over 5 percent of the gross value of crop production.

Feed. For the livestock sector, the basic input subsidy was given through balanced feed sold to producers at lower than market rates through the government's balanced feed company, ALBAMEX. During the 1982-89 period, the balanced feed subsidies were distributed among milk production (30%), egg production (26%), pork (18%), poultry (16%), and beef (10%). ALBAMEX was sold to the private sector in March 1991.

Figure 8 shows the government cost of the inputs subsidies. D is the demand curve for inputs, and S the supply of inputs, which is assumed to be perfectly elastic at P_W, the world price of inputs. The per unit subsidy $P_W P_S$, encourages additional demand for inputs to I_1, from the free market level of I_0. The government cost of the input subsidy is $P_S P_W DC$. An increase in the unit subsidy by $P_S P_{S1}$ increases cost by $P_S P_{S1} FEDC$.

Figure 8



Marketing Subsidies

In addition to procurement of domestic production and imports CONASUPO also participates through its affiliates, in the wholesaling (IMPECSA), retailing (DICCONSA), and warehousing (ANDSA, BORUCONSA) of commodities. CONASUPO has been the monopoly importer of grains, oilseeds, and powdered milk, for sale at processing by its affiliates.

In 1989, CONASUPO eliminated the marketing support for all primary agricultural commodities, except corn and dry beans, but has not yet modified its role in the wholesale food distribution network (IMPECSA) and the several nationwide chains of retail grocery stores (DICCONSA). IMPECSA provides wholesale services to small, private food retailers. DICCONSA's retail outlets included rural stores with targeted consumers, and urban supermarkets, both concessioned and directly managed for untargeted consumers.

CONASUPO has introduced changes in its warehousing system (ANDSA and BORUCONSA) which together own over 56% of Mexico's 26.5 million tons of basic food storage capacity. These two organizations played distinct but complementary roles: while ANDSA operated silos, warehouses, and cold storage facilities in urban areas, BORUCONSA was the only storage facility, for basic crops grown in more remote rural areas. ANDSA also provided financial services, and inputs. The primary objective of BORUCONSA was to assist small and medium-scale farmers, primarily corn and dry beans producers, with acquisition, storage, and transportation of their harvest. As part of the reform program, ANDSA will modernize its infrastructure and link it to the transport and port infrastructure. BORUCONSA is to expand its geographic coverage, offer its warehouse capacity not only to CONASUPO but also to organizations of producers, distribute fertilizers and pesticides, and operate procurement centers in remote areas. Both warehousing facilities are to provide services for private traders at commercial rates.

A new organization, Support and Services to Agricultural Marketing (ASERCA), was created in April 1991 to facilitate the phase out of CONASUPO's intervention in the marketing of grain and oilseeds, except corn, rice and dry beans. ASERCA will administer a system of deficiency payments for producers to guarantee post harvest financing, administer production subsidies, and ensure an adequate supply of commodities in the domestic market. The Ministry of Commerce (SECOFI) will act as mediator between producers and buyers, while the Foreign Trade Bank (BANCOMEXT) will finance exports of products.

For 1991, ASERCA has stipulated marketing programs for wheat, sorghum, and soybeans. Under this program registered producers can turn over their grain to the storage facility and, in turn, be paid a previously agreed upon price. The buyer of the grain will receive a certificate of deposit guaranteeing payment. Designated banks will give the buyer an amount equivalent to the difference of his payment to the producer and the real cost of the commodity, while the remainder of the buyer's payment is to have a 6-month financing term. The money to be used in the financing will be drawn from a fund created by SARH and the banking system.

Consumer Subsidies

CONASUPO has participated in the processing of commodities through its industrial food processors affiliates, ICONSA (CONASUPO Grain and Oilseeds Industries), LICONSA (CONASUPO Industrialized Milk), MICONSA (CONASUPO Industrialized Maize), and TRICONSA (CONASUPO Industrialized Wheat), and administered targeted subsidy programs for the low income population.

Food Grains. CONASUPO provided direct consumer subsidies on wheat flour and wheat bread (*bolillos*). CONASUPO sells domestic and imported wheat to millers at a price below its purchase price, and ensures low consumer prices through direct sales of bread and flour at fixed prices in its wholesale and retail outlets.

For corn, CONASUPO also sells corn to mills at subsidized prices, and directly subsidizes the price of processed goods (yellow tortillas, flour, and dough) for low-income consumers.

CONASUPO purchased beans directly from producers at a guaranteed price or imported directly at the world price. Beans were then sold to consumers at controlled prices. All marketing costs (distribution and storage) were absorbed by CONASUPO. Consumer prices were controlled mostly in urban markets, but rural consumers benefited through direct bulk sales.

Feed. Users of soybean meal and sorghum have also received a price subsidy administered by CONASUPO. Domestic and imported soybeans are purchased at guaranteed or world prices and sold to processors at a lower price, with CONASUPO absorbing all marketing costs. This policy has supported producers of livestock products (e.g. eggs, beef, chicken, pork and milk) who faced controlled prices for their products.

Food. Coupons, representing a target subsidy for specific consumers, were introduced in 1987. The current policy objective is to increase the use of subsidies targeted at specific consumers (targeted consumers are identified as those earning less than twice the minimum salary).

Since mid-1989 CONASUPO has been selling its processing facilities, selling the 3 commercial plants of LICONSA and the milk production and distribution affiliate of CONASUPO. However, divestiture of these plants has run into problems because of the lack of regulation.

ICONSA, a diversified food processing industry whose principal activity was to crush, refine, and package vegetable oils and lard, byproducts (animal feed, soaps, detergents), as well as corn flour, wheat flour and pastas has been disincorporated.

MICONSA the maize processing industry for tortilla production is still an affiliate of CONASUPO. MICONSA has traditionally received CONASUPO's subsidies both via price differentials and post-production reimbursement.

TRICONSA, CONASUPO's bread company which provided various wheat products for low-income consumers, was liquidated in early 1987.

CONASUPO still has three targeted subsidies programs: *tortibonos* (*tortivales*) program providing each household with tortilla stamps to obtain 1 kilo of free tortillas per day, the LICONSA program (milk provision), and the DICONSA program (a retail distribution branch of CONASUPO).

Table 10 presents Mexico's internal agricultural support programs in procurement, marketing and consumption through CONASUPO and its affiliates.

TABLE 10 -INTERVENTION IN MARKETING, AND CONSUMPTION

MEXICAN AGRICULTURAL STATE-OWNED ENTERPRISE	LEVEL OF INTERVENTION
CONASUPO (Restructured)	CROP PURCHASING
DICCONSA (Will not be disincorporated)	RETAILING
LICONSA (Will not be disincorporated)	MILK PROVISION
ICONSA (Disincorporated)	GRAINS AND OILSEEDS
MICONSA (Reestructured)	CORN
ANDSA (Reestructured)	WAREHOUSING
BORUCONSA (Reestructured)	MARKETING
IMPECSA (Will not be disincorporated)	WHOLESALING
PRONAGRA (Disincorporated)	GRAIN PRODUCTION

United States Barriers to Trade

Tariffs and import quotas are not the main focus of protection provided for most American farmers. The main forms are deficiency payments and other production subsidies that do not restrict imports directly. For example, producer subsidy equivalents for wheat are shown in Table 11 for 1982-89. A large number of programs subsidize producers, but in recent years 35% of producer subsidies came from deficiency payments.

Border measures are more important for dairy products, beef and sugar. Producer subsidy equivalents for sugar are shown in Table 12, and tariffs and quotas comprised 74% of total PSEs for the period 1986-88. However, liberalizing these border measures are not expected to increase Mexican exports of these products. The U.S. currently exports beef and dairy products to Mexico.

U.S. border measures that are more significant for Mexican trade are those on fruits and vegetables. The most important products in terms of value of trade in 1988 were tomatoes, onions, bell peppers, chili peppers and cucumbers. Tariffs are mainly expressed as cents per kilogram, so the ad valorem equivalent of the specific tariffs varies with the product price. A distinctive feature for some products is a tariff that varies with the season of the year to give greater protection when Americans are marketing their products. The ad valorem equivalent tariffs in 1988 were: tomatoes 7-11% (seasonal), onions 9%, chili peppers 10%, bell peppers 14%, cucumbers 9-38% (seasonal). In addition to tariffs, many fruits and vegetables are subject to marketing orders.

Table 11. United States PSE for Wheat

	**Code	Units	1982	1983	1984	1985	1986	1987	1988	1989	86-88 AVE
Wheat:											
Level of production	--	1000 Tons	75,250	65,857	70,618	65,974	56,896	57,362	49,320	55,426	54,526
Producer price	--	$/ton	126	128	124	112	89	96	136	136	107
Value of production	--	Mil.$	9,489	8,435	8,772	7,371	5,042	5,498	6,684	7,542	5,741
Direct Payments (indicated by (*)	--	Mil.$	718	3,335	2,158	2,653	4,407	3,542	1,997	1,246	3,974
Value to producers	--	Mil.$	10,206	11,770	10,929	10,024	9,449	9,039	8,681	8,789	9,056
Policy transfer to producers:											
*Crop insurance	IS	Mil.$	-12	-7	44	133	49	2	223	177	134
*Deficiency payments	IS	Mil.$	476	770	1,049	1,555	3,485	3,290	1,217	573	1,693
*Disaster	IS	Mil.$	12	1	0	0	0	0	469	470	313
*Diversion	IS	Mil.$	0	309	506	653	215	0	0	0	0
*Loan forfeit benefits	IS	Mil.$	-2	48	53	141	487	106	-10	-22	25
*PIK entitlements	IS	Mil.$	0	2,023	329	0	0	0	0	0	0
Price enhancing policies	IS	Mil.$	0	0	0	272	552	1,443	636	296	792
Commodity loans	IA	Mil.$	346	688	415	430	376	309	187	144	213
Farm credit	IA	Mil.$	139	153	156	132	84	96	112	107	105
Fuel excise tax	IA	Mil.$	7	2	0	0	0	0	0	0	0
Pest and disease control	IA	Mil.$	20	14	17	16	11	12	15	17	15
Advisory	MA	Mil.$	20	20	19	16	13	12	14	17	14
Inspection	MA	Mil.$	1	0	0	0	0	0	0	0	0
Processing and marketing	MA	Mil.$	7	5	7	5	5	4	5	5	5
*Storage	MA	Mil.$	242	192	176	172	170	145	99	48	97
Farm storage facility	FS	Mil.$	1	1	0	0	0	0	0	0	0
Land improvements	FS	Mil.$	50	48	50	46	32	31	41	41	38
Research	FS	Mil.$	49	49	49	45	34	36	43	48	43
State programs	RS	Mil.$	102	102	102	98	81	83	100	112	99

Table 11 (continued)

	**Code	Units	1982	1983	1984	1985	1986	1987	1988	1989	86-88 AVE
Taxation	EP	Mil.$	107	82	83	67	53	29	25	38	31
Transport	EP	Mil.$	40	32	34	22	18	18	23	23	21
Total transfers to producers	--	Mil.$	1,605	4,531	3,089	3,804	5,667	5,614	3,200	2,095	4,827
PSE as ratio to producers' value	--	Percent	16	38	28	38	60	62	37	24	53
PSE per ton, in local currency	--	$/ton	21	69	44	58	100	98	65	38	87
PSE per ton, in US dollars	--	US$/ton	21	69	44	58	100	98	65	38	87

Marketing Orders

A marketing order is a legally binding set of requirements imposed on certain producers of certain products, usually fruits, vegetables and specialty crops. Among the stated goals of orders are "orderly marketing," enhancing producer prices relative to their parity levels, and protecting consumer interests (Polopolus, et al. p. 12). The orders can affect international trade, because section 8e of the Agricultural Marketing Agreement Act of 1937 allows certain provisions of marketing orders to be applied to imports as well as to domestic products.

Marketing orders contain a variety of features which can be divided into three groups: (1) promotion, research, and packaging, (2) restrictions on grades and sizes, and (3) volume controls. (See Table 13.) Promotion is intended to increase product demand. Volume controls can be used to alter the mean or variance of prices. They may also be used to carry out price discrimination. Restrictions on sales of fresh products in the domestic market may divert sales into foreign markets or into processing (Gardner pp. 220-221, Helmberger pp. 152-53). Restrictions on grade and size are the most common features, they are included in nearly all marketing orders.

Proponents claim that grade and size restrictions enhance the average quality of products and protect the "integrity of the product." They also claim that the compulsory nature of orders is necessary, because the free rider problem would prevent individual sellers from voluntarily refraining from marketing low quality products.

The legal authority for marketing orders comes from the 1937 Agricultural Marketing Agreement Act plus numerous amendments. There are some state marketing orders in additions to federal ones. New marketing orders and amendments to old ones must be approved by vote of domestic producers. Administrative committees make annual reports to the Secretary of Agriculture, and amendments to orders must be approved by the Secretary. Amendments are usually initiated by domestic producer groups who have complained about excessive delays between their proposals and decisions by the Secretary (Polopolus et al.). Conversely, exporters to the U.S. have complained that some decisions have been without public hearings and without sufficient time to allow foreign growers to respond to new features of amended orders (Bredahl et al.). Thus, even if marketing orders continue to be applied to imports into the United States, Mexican growers have an interest in procedural safeguards that would restrict their use as barriers to imports.

A number of fruits, vegetables, and specialty crops are covered by marketing orders, and some new ones have proposed (see Table 13 and USITC). The most important product in terms of value of imports is fresh tomatoes. Mexican tomatoes compete directly with Florida tomatoes during the December to April marketing season. In 1990, Florida tomatoes comprised 53.3% of the U.S. market, and Mexican tomatoes were 43.9% of the market (Messina and Clouser, p13). Previous political and legal skirmishes between Florida growers and an alliance of Mexican exporters, U.S. importers, and U.S. consumers has been described as "the Great Tomato War" (Bredahl).

Table 12. United States PSE for Sugar

	**Code	Units	1982	1983	1984	1985	1986	1987	1988	1989	86-88 Avg.
Sugar:											
Level of production	--	1000 tons	4,918	4,773	5,013	5,116	5,678	6,215	5,825	5,610	5,906
Producer price	--	$/ton	311	327	303	296	304	310	326	342	313
Value of production	--	Mil.$	1,530	1,559	1,520	1,513	1,726	1,925	1,900	1,916	1,851
Direct payments (indicated by *)	--	Mil.$	-1	5	1	0	0	-2	16	10	-1
Value to producers	--	Mil.$	1,529	1,564	1,521	1,512	1,726	1,923	1,916	1,926	1,855
Policy transfers											
*Crop insurance	IS	Mil.$	-1	5	1	0	0	-2	7	5	3
*Disaster	IS	Mil.$	0	0	0	0	0	0	9	5	5
Price supports/ quotas	PI	mIL.$	894	936	1,115	930	1,117	1,026	768	626	805
Farm credit	IA	Mil.$	22	28	27	27	29	33	32	27	31
Fuel excise tax	IA	Mil.$	1	0	0	0	0	0	0	0	0
Pest and disease control	IA	Mil.$	3	3	3	3	4	4	4	4	4
Advisory	MA	Mil.$	3	4	3	4	5	4	4	4	4
Inspection	MA	Mil.$	0	0	0	0	0	0	0	0	0
Processing and marketing	MA	Mil.$	1	1	1	1	2	1	2	1	1
Land improvments	FS	Mil.$	14	16	15	16	21	20	21	19	20
Research	FS	Mil.$	8	9	8	9	12	13	12	12	12
State programs	RS	Mil.$	16	19	18	20	28	29	29	29	29
Taxation	EP	Mil.$	17	15	14	14	18	10	7	10	9
Transport	EP	Mil.$	2	1	1	1	1	1	1	1	1
Total transfers to producers	--	Mil.$	980	1,037	1,207	1,025	1,234	1,139	895	744	1,090
PSE as ratio to producers's value	--	Percent		64	66	79	68	72	59	47	59
PSE per ton, in local currency	--	$/ton	199	217	241	200	217	183	154	133	185
PSE per ton, in U.S. dollars	--	US$/ton	199	217	241	200	217	183	154	133	185

Table 13: Authorized regulations of Federal marketing orders[1]

Produce item	Promotion, research, and package			Grade and size		Volume controls				
	1	2	3	4	5	6	7	8	9	10
	Category									
Citrus fruits:										
California-Arizona naval oranges[2]	x	x			x		x			
California-Arizona Valencia oranges[2]	x	x			x		x			
California-Arizona lemons[2]	x	x			x		x			
Florida citrus[3]			x	x	x	x				
Florida limes	x	x	x	x	x	x	x			
Texas oranges and grapefruit[4]	x	x	x	x	x					
Deciduous fruits:										
California nectarines	x	x	x	x	x					
California pears, peaches	x	x	x	x	x					
California kiwifruit			x	x	x					
California desert grapes	x	x	x	x	x	x				
California Tokay grapes	x	x	x	x	x	x	x			
California olives	x	x		x	x					
Colorado peaches	x	x		x	x					
Florida avocados	x	x	x	x	x	x				
Georgia peaches				x	x					
Hawaii papayas	x	x	x	x	x					
Pacific Coast winter pears	x	x		x	x					
Washington apricots	x	x	x	x	x					
Washington sweet cherries	x	x	x	x	x					
Washington peaches	x	x	x	x	x					
Washington-Oregon Bartlett pears	x	x	x	x	x					
Washington-Oregon fresh prunes	x	x	x	x	x					
Cranberries (10 states)[5]									x	x

1. Generic advertising and promotion.
2. Production and marketing research.
3. Package and container requirements.
4. Grade requirements.
5. Size requirements.
6. Shipping holidays.
7. Prorates.
8. Market allocation
9. Reserve pool.
10. Marketing allotment.

Table 13: Authorized regulations of Federal marketing orders[1]-Continued

Produce item	Promotion, research, and package			Grade and size		Volume controls				
	1	2	3	4	5	6	7	8	9	10
	Category									
Dried fruits:										
California dates	x	x	x	x	x			x		
California prunes	x	x	x	x	x				x	
California raisins	x	x		x	x			x	x	
Vegetables:										
Florida celery	x	x	x	x	x	x	x			x
Florida tomatoes	x	x	x	x	x					
Idaho-E.Oregon onions	x	x	x	x	x	x				
Rio Grande Valley (Texas) tomatoes[2]	x	x	x	x	x					
South Texas lettuce	x	x	x	x	x	x	x			
South Texas onions	x	x	x	x	x	x				
Texas melons	x	x	x	x	x					
Vidalia onions	x	x								
Potatoes:										
Colorado	x	x	x	x	x					
Idaho-E.Oregon			x	x	x					
Maine										
S. Oregon N. California	x	x		x	x					
Texas-New Mexico[2]			x	x	x					
Virginia-N. Carolina				x	x					
Washington				x	x					
Nuts:										
California almonds	x	x		x				x	x	
California walnuts	x	x		x	x			x	x	
Oregon-Washington hazelnuts (filberts)				x	x			x		
Peanuts[4,7]				x	x					
Other specialty crops:										
Spearmint oil (six western States)[8]	x	x						x	x	

[1]As of September 1, 1989.
[2]Marketing order only; no marketing agreement.
[3]Covers oranges, grapefruit, tangerines, and tangelos entering fresh-use markets. Includes Indian River and Interior grapefruit programs.
[4]Restricting handler deliveries is specifically prohibited.
[5]Grade and size requirements apply only to portion of crop placed into the reserve pool.
[6]Marketing agreement only; no marketing order. Covers States of Alabama, Florida, Georgia, Mississippi, South Carolina, Arizona, Arkansas, California, Louisiana, New Mexico, Oklahoma, Texas, Missouri, North Carolina, Tennessee and Virginia.
[7]Contains a provision authorizing the inspection for alfatoxin damaged peanuts.
[8]Covers States of Washington, Idaho, Montana, Nevqada, Utah, Oregon and California.
Source: Powers, N. J. Federal Marketing Orders for Horticultural Crops. 1990.

Critics of marketing orders have pointed out that it is possible to use grade and size restrictions to reduce total supply in the domestic market and raise domestic prices. It is also possible to use marketing orders to harm consumers and processors by lowering the average quality of products as viewed by buyers. Quality has many dimensions, including size and taste, that could be represented by a hedonic index. Consumers would be willing to pay more for larger tomatoes, holding constant taste and other characteristics, but they would be willing to accept smaller tomatoes for a sufficient improvement in taste. Suppose the average imported tomato was smaller but tastier than the average domestic tomato. A marketing order based on size could decrease a typical consumer's net valuation of tomatoes by adding $.01 due to greater size but subtracting $.02 due to decline in taste. For example, in the case of one tomato marketing order minimum sizes for vine-ripe tomatoes (produced primarily in Mexico) and mature green tomatoes (produced primarily in Florida) were chosen in a way that "would have significantly reduced Mexican exports of tomatoes to the United States (Bredahl et al). In addition, American buyers did not consider the larger average size of tomatoes to be sufficient compensation for the loss in other characteristics. The adverse effect on net quality of restricting imports size was expressed in a Consumer Reports editorial entitled, "Why Tomatoes This Winter May be Tough, Tasteless and Costly." (Bredahl, et al, p.6) Another example illustrating the multiple dimensions of quality is the case of imported filberts (hazelnuts). U.S. buyers of filberts for making candy and confections favored a lower standard for imported nuts (percentage of defective nuts) than for domestic filberts because they preferred the higher oil content of imports (Polopolus et al. p.38). Thus, it is possible for total quality to increase in spite of an increase in percentage of defective products. Focusing on a single dimension of quality can be misleading.

Although it is possible to use marketing orders to restrict imports, there are some economic forces that would reduce their effectiveness as trade barriers. Marketing orders apply only to imports of fresh products, and imported processed products may be imperfect substitutes for fresh products. Thus, imports of tomato sauce and tomato paste from Mexico would be expected to reduce any effects of marketing orders on fresh tomatoes. Secondly, large and small products may be good substitutes in the eyes of consumers. U.S. marketing orders may increase the average size of imported tomatoes without necessarily changing total tomato imports. Some of the large Mexican tomatoes that would have been consumed in Mexico in absence of an order would instead by shipped to the U.S. Conversely, some small Mexican or U.S. grown tomatoes that would have been consumed in the U.S. in absence of a marketing order would instead be consumed in Mexico. This offsetting effect depends on the U.S. marketing order not being applicable in Mexico.

Empirical evidence on the restrictive effect of U.S. marketing orders on imports is rather sparse. The USITC study concludes that removal of tariffs and marketing orders would result in a significant increase in U.S. imports from Mexico, especially winter vegetables that are manually harvested (USITC p.4-3). However, they do not separate the effects of tariffs and marketing orders. Bredahl et al provide evidence that minimum size provisions in tomato

marketing orders discriminated against imports. They also claim the gain to consumers from larger tomatoes was dominated by the loss of other desirable characteristics brought about by the marketing order. However, they did not provide a quantitative measure of the restrictive effect of the order on imports.

More general studies of the effect of marketing orders on domestic prices seem to show mixed results. Studies of the California-Arizona naval orange marketing order indicate price discrimination as a result of shifting sales to processing and the foreign market, where demand is more elastic (Helmberger pp.152-53). The result is a gain to U.S. producers, a loss to U.S. consumer, and a deadweight loss. However, a study by Jesse and Johnson compared prices of products not covered. They concluded that products covered by marketing orders did not have prices that were systematically higher and less variable than products that were not covered (Jesse and Johnson, p.45). That leaves unanswered the question of what is the purpose of the orders and "why are growers generally supportive of these programs which do not appear to have achieved a major objective of the Agricultural Marketing Agreement Act?" (Jesse and Johnson, p.45). Thus, it is possible to devise marketing orders that would restrict trade, but empirical evidence demonstrating that real world marketing orders operate this may remains weak.

4. Aggregate Models of a Free Trade Agreement

Several macroeconomic models have been used to analyze the likely effect of the proposed free trade agreement involving the United States, Canada and Mexico. The basic goal of all models is the same, namely to show the effect of a free trade agreement (FTA) on real income, trade, and related variables for the three countries. Therefore, it is instructive to compare the results of alternative models. However, before comparing results, some difference among models should be recognized.

The models to be considered are by (1) Brown, Dearforff, and Stern, (2) Almon for the Department of Labor, (3) Peat Marwick, (4) Harris and Cox, (5) U.S. International Trade Commission (USITC), (6) Sobarzo, and (7) Hinojosa-Ojeda and Robinson. The models differ in terms of the amount of detail devoted to each country. Only the Brown-Deardorff-Stern paper treats the U.S., Canada and Mexico in detail. The Almon, Peat Marwick, and Hinojosa-Ojeda and Robinson studies treat the U.S. and Mexico explicitly. The Harris paper deals with Canada only, Sobarzo with Mexico only, and the USITC with the U.S. only.

The models differ in several ways in addition to country coverage. There are differences in model structure as well as parameter values used. Base years differ in some cases. The level of aggregation varies including aggregation of (and definition of) the agricultural sector. Assumptions concerning macroeconomic and exchange rate policy vary. Assumptions about changes in total employment and real wages differ in some cases. Perhaps the most important difference among the models is the coverage and measurement of trade barriers and the extent of

liberalization that occurs. There is not much disagreement about tariff rates in a particular year, but non-tariff barriers were treated in variety of ways, and non-budget measures were rarely treated. A final difference is the treatment of capital flows into Mexico induced by trade liberalization.

In spite of the differences, all the studies except the USITC paper provide explicit measures of the changes in real income and total trade. Changes are generally expressed as changes in gross domestic product per capita or equivalent variation i.e., the change in income valued at base period prices that yields the same change welfare as the given tariff change. The published version of the USITC study expresses change in economic variables as "significant", "moderate", or "negligible" rather than quantitatively.

A near unanimous result of the studies is that the real incomes of all participating countries would rise. The only exception is the Almon model that shows a slight decrease (-.04%) in Mexican real income. In the Hinojosa-Ojeda and Robinson model the gain to the U.S. is at most 0.1% of the GDP. When the rest of the world is treated explicitly, the gains to member countries exceed the losses of non-members, i.e. the world benefits from preferential trade. The magnitude of the income gains varies from .04% to 4.6%. The changes are expressed as what the values would be in the presence of trade liberalization relative to what they actually were in the base period. They should be interpreted as once-for-all gains rather than gains per year.

Different combinations of preferential arrangements have been analyzed by different models. The base situation is non-discriminatory tariffs all other countries. One case is bilateral free trade between the U.S. and Canada. A second case is the proposed U.S.-Canada-Mexico free trade agreement. A third is bilateral free trade between the U.S. and Mexico. A fourth is two separate bilateral agreements between the U.S. and Canada and between the U.S. and Mexico. In this case Canada and Mexico do not eliminate tariffs against each other. This arrangement has been described as a hub-and-spoke system by Wonnacott. A practical question for Canada is whether they should participate in the trilateral agreement given that a bilateral agreement already exists with the U.S. Two models address this question and they reach the same general conclusions. Canada would be slightly better off with a trilateral agreement than with a hub-and-spoke system, but the difference is small. In terms of the Cox-Harris model, Canada's real income would be .12% higher with the NAFTA than with U.S.-Canada free trade. Brown-Deardorff-Stern reach the same conclusion. The highest real income for Canada occurs with the U.S.-Canada free trade. Adding Mexico, lowers Canada's income by $52 million, but a hub-and-spoke system lowers Canada's income by $77 million. Canada is affected much more by its trade relationship with the U.S. than it is with its direct trade relationship with Mexico or the indirect effect on Canada of U.S.-Mexican trade.

There are major disagreements among the macro models on the effect of the free trade agreement on U.S. agriculture. Almon's paper shows agriculture being one of the biggest sectoral gainers in terms of production and employment. Conversely, both the Brown-Deardorff-

Stern paper and the Peat Marwick study show a contraction of U.S. agriculture as a result of liberalization.

The Peat-Marwick paper divides agriculture into four sectors: animal products, field crops, fruits and vegetables, and other agriculture. According to the model, the FTA causes output and employment to fall in all the agricultural sectors, except animal products, which are not affected. Among the 22 sectors fruits and vegetables and field crops are among the ten largest losers in terms of value of output. Although the paper describes the free trade agreement as eliminating all tariffs and the tariff equivalent of quotas, the authors warn (p.5) that they may have underestimated the stimulus to the U.S. field crops sector.

The Brown-Deardorff-Stern model also predicts that the FTA will cause U.S. agriculture to contract. Agriculture is treated as a single aggregate using 3 digit ISIC categories. For U.S. agriculture, the model predicts an increase in imports and a decrease in exports, production and employment. In Canadian agriculture, the opposite results are predicted for Mexican agriculture.

The Almon study concludes that the FTA will stimulate U.S. agriculture. Two cases are considered: (1) elimination of tariffs only and (2) tariffs plus certain non-tariff barriers. Elimination of non-tariff barriers for agriculture is represented by an assumed increase of U.S. exports to Mexico of 10-20% per year from the 1989 base period. When both tariffs and these non-tariff barriers are eliminated, U.S. agriculture shows one of the largest sectoral gains in exports and employment. Conversely, when only tariffs are eliminated, agriculture does not appear as one of the most expansionary sectors. Thus, the main stimulus to U.S. agriculture appears to be attributable to the reduction in non-tariff barriers.

The USITC study considered the effects of the FTA on the major sectors of U.S. agriculture, although it does not provide quantitative estimates. The first result is a significant increase in U.S. horticultural imports from Mexico, assuming the elimination of U.S. marketing orders and that Mexican goods satisfy U.S. phytosanitary standards. Horticultural products include both fresh and processed products, and the Mexican processing sector has received considerable U.S. direct investment in recent years.

The USITC study also expects a significant increase in U.S. exports of grains and oilseeds to Mexico. In the livestock sector the study predicts a moderate increase in U.S. imports of feeder cattle and a moderate increase in U.S. exports of meat to Mexico. In absence of quantitative estimates, it is not possible to compute the net effects of U.S. agricultural trade. However, since the USITC's grains and oilseeds category overlaps considerably with the field crops category used in the Peat Marwick paper, there is a conflict in results. The USITC expects the grains and oilseeds sector in the U.S. to expand as a result of the FTA, whereas the Peat Marwick paper expects it to contract.

Hinojosa-Ojeda and Robinson treat agriculture as one of the seven sectors in a general equilibrium model with three countries: the U.S., Mexico, and the rest of the world. Two of their

experiments are removing all bilateral tariffs and removing both tariffs and quotas. U.S. GDP rises by 0-12% in response to tariff removal and it remains approximately constant when both tariffs and quotas are removed. In Mexico, real GDP rises by 0.1% with tariff removal and 0.3% when both tariffs and quotas are removed. In agricultural sector, total output in the U.S. is constant when tariffs are removed and falls by 0.1% when tariffs are removed and rises by 0.2% when both tariffs and quotas are removed.

In the base year of 1988 the U.S. had a bilateral agricultural trade deficit with Mexico of $417 million. According to the model, U.S. agricultural exports to Mexico would increase by a greater percentage than U.S. agricultural imports from Mexico both with tariff removal and tariff plus quota removal. Quota removal is a greater stimulus to trade than tariff removal for both exports and imports.

Other conceptual experiments are also performed including increasing Mexico's capital stock by 7.5%. This last experiment has a greater economic effect on both Mexico and the United States than trade liberalization. In this case, U.S. agricultural exports to Mexico increase by 39.2% compared to 19.0% with the removal of tariffs and quotas.

The FTA may induce an increase in capital flows into Mexico, but these flows are not treated in a uniform way by the various authors. The magnitudes are potentially important, and they depend on relaxation of foreign investment rules by Mexico. The Peat Marwick paper treats capital stock necessary to keep the rate of return on capital equal to its pre-FTA level. As a result, Mexican income increases by 4.64% compared with .32% when the Mexican capital stock is held constant.

An advantage of embedding agriculture in an aggregate model is that interactions among broad sectors can be shown explicitly. A disadvantage is the loss of detail about individual products and product-specific policies. A more detailed model might also help to resolve some of the contradictions and ambiguities about the agricultural sector coming from the aggregative models.

5. Simulating the Effects of a Free Trade Agreement

Model and Scenarios

The Static World Policy Simulation (SWOPSIM) framework is used to analyze impacts of a free trade agreement (FTA) between the United States and Mexico.[4] The model consists of 3 countries (U.S., Mexico, and Rest-of-World) and 29 agricultural commodities. We assume that

[4] Canada is omitted from this analysis for two reasons. First, an additional country greatly increases the size of a SWOPSIM – Armington model, and second, Canada's impact upon the results for the United States and Mexico are expected to be quite small.

commodities are imperfect substitutes and that consumers discriminate among commodities on the basis of their geographical origin, i.e., the Armington hypothesis. Commodities in the model include 9 livestock products, 9 grains and oilseeds, 6 horticultural crops, and 5 other crops. For a detailed description of the model structure and base data set, see Liapis, Krissoff and Neff. A more complete discussion of the results, including more commodity discussion, is presented in Krissoff, Neff, and Sharples.

The model contains supply and demand equations for each commodity in each country. These equations are set to reproduce prices and quantities produced, consumed, and traded in 1988. We assume that world agricultural markets are in intermediate-run equilibrium under 1988 conditions. "Intermediate-run" means that the supply and demand elasticities in the model represent about a 3- to 5-year period of adjustment to changes in policies and prices.

There are at least four ways that this partial equilibrium analysis may differ from the general equilibrium modeling discussed in the previous section. First, income growth generated by an FTA is not endogenously modeled. Second, nominal exchange rates are assumed to be fixed so that changes in the (agricultural) balance of trade can occur. Third, factor markets are not explicitly modeled. Fourth, considerable detail is allocated to individual agricultural markets but there is no examination of nonagricultural markets.

Domestic and border policies that existed in 1988 are put into the model as price wedges. They represent differentials among the various observed price signals for a given commodity. Each of the 3 scenarios examined in this study is obtained by removing selected policies and their associated price wedges, and obtaining a new equilibrium solution. For further explanation of price wedges in the SWOPSIM model, see Roningen, Sullivan and Dixit.

An average of the model's border price wedges (import tariff equivalent) for the four commodity groups are shown below. The numbers express in percent the price wedge equivalent of border measures divided by the traded price. They do not include direct and indirect producer and consumer subsidies. (Each import tariff equivalent for the commodity group is trade-weighted.)

	United States	Mexico
	-----percent-----	
Grains/Oilseeds	0	32
Livestock/meats/dairy	2	13
Horticulture	23	14
Other	1	8
All 29 commodities	5	24

Mexican price wedges are greater than U.S. wedges except in horticultural products. This suggests that a bilateral liberalization will tend to move the U.S. agricultural trade balance with Mexico to a (greater) surplus.

Scenarios

The FTA is analyzed under several alternative sets of conditions. In particular, we use the 3-country model to analyze 3 scenarios. The first scenario assumes that an FTA between the United States and Mexico is put in place under levels of protection and world market conditions that existed in 1988. To obtain this solution, the 1988 base model is modified by removing two-way border protection between the United States and Mexico.

The second scenario assumes that Mexico unilaterally removes all border protection with all countries. This solution is obtained by removing Mexico's border protection but making no changes for the other two countries. This scenario represents the extreme of the policy direction taking place in Mexico since the late 1980s. It gives an indication of the impacts on world agriculture of Mexican trade liberalization without a U.S.-Mexico FTA.

The third scenario combines the first two – Mexico is assumed to unilaterally remove all border protection with all countries and it also is assumed to enter into a free trade agreement with the United States. It is obtained by removing Mexico's border protection for the other two countries and also removing U.S. border protection for Mexican imports. Border protection remains for all imports into Rest-of-World and for U.S. imports from Rest-of-World.

This third scenario, when compared with the first two, indicates (1) the combined impact of an FTA and unilateral liberalization in Mexico, and (2) which of these two changes affect agriculture the most in each country. A comparison with the first scenario gives an indication of how the United States would be affected if Mexico were to first give the U.S. sole free access to Mexican agricultural markets and then decide to give all countries equal free access. A comparison with the second scenario gives an indication of the impact of putting in place a U.S.-Mexico FTA after Mexico unilaterally liberalizes – an extreme extension of what is taking place recently in Mexico.

The results presented here describe the impact of each of the 3 policy scenarios in a typical year after each scenario is fully implemented and the agricultural sectors of the participating countries (and the rest of the world) have had several 1988-like years in which to adjust.

Each scenario represents an idealized case. None of the 3 is claimed to represent a likely outcome of current negotiations.

Scenario 1: U.S.-Mexico FTA

Trade Impacts

Under 1988 market conditions, model results indicate that a U.S.-Mexican FTA would increase bilateral U.S.-Mexico trade of agricultural commodities by more than 15 percent. (Note, all trade results are reported in value units, not quantity units – see Table 14.) U.S. agricultural exports to Mexico would increase more than 3 times the increase in Mexican agricultural exports to the United States. One reason is that in 1988, Mexico's border protection was higher than that of the United States.

There would be a small decrease in U.S. agricultural exports to Rest-of-World (ROW), due primarily to slightly higher world prices. The price increases are a result of increased imports and domestic consumption by Mexico and the United States.

The ROW experiences only a small increase in net exports (a small decrease in exports and a somewhat larger decrease in imports). That is primarily due to the fact that without the FTA, the United States accounts for most of Mexico's agricultural trade. Thus there would be little opportunity for diverting Mexico's imports away from the ROW and to the United States with an FTA. Also, the model results show that the ROW's aggregate exports to the U.S. remain about the same after the FTA as before.

Welfare Impacts

Other studies have examined the welfare implications of FTAs. For a review, see Pomfret. Theoretical models show that the model assumptions can determine whether countries and the world are shown to gain and lose welfare from a preferential trade agreement. Our model allows for increasing costs (upward sloping supply functions), substitution in production and consumption (cross-price elasticities), and changes in market prices, but it does not include increasing returns to scale not other dynamic gains. The cited theoretical analyses show that with these assumptions in our model, one cannot determine ex ante the direction of shift in welfare as a result of putting an FTA in place. Model parameters will determine the outcome.

Table 14--Changes From BASE in Agricultural Exports, Three Scenarios

Exporter	Importers: U.S.	Mexico	ROW	Total Exports
	--million dollars--			
Scenario 1: PTA				
United States	-	482	-59	423
Mexico	166	-	5	171
Rest-of-World	3	-39	-	-36
Total	169	443	-54	558
Scenario 2: Unilateral Mexican Trade Liberalization				
United States	-	435	-46	389
Mexico	25	-	24	49
Rest-of-World	16	30	-	46
Total	41	465	-22	484
Scenario 3: PTA Plus Mexican Trade Liberalization				
United States	-	438	-44	394
Mexico	160	-	18	178
Rest-of-World	0	31	-	30
Total	160	469	-26	602

Our model measures welfare as producer and consumer surplus, plus changes in government revenues/expenditures. Results show that U.S. producers and consumers of agricultural commodities would face slightly higher prices in aggregate as a result of the FTA. Producers also would increase production because of expanded exports to Mexico. Consequently, U.S. producers would experience a welfare gain, consumers would experience a welfare loss, and the Government would reduce expenditures on various farm programs (Table 15).[5] The net impact would be a welfare gain for the U.S. from its agricultural sector.

Table 15--Changes From BASE in Welfare, Three Scenarios

Source of welfare change	U.S.	Mexico	ROW	World
		--million dollars--		
Scenario 1: PTA				
Producer welfare	225	-438	432	-
Consumer welfare	-122	978	-701	-
Government savings	207	-440	0	-
Total	310	100	-269	141
Scenario 2: Unilateral Mexican Trade Liberalization				
Producer welfare	279	-503	551	-
Consumer welfare	-232	1068	-816	-
Government savings	201	-500	0	-
Total	248	65	-265	48
Scenario 3: PTA Plus Mexican Trade liberalization				
Producer welfare	222	-457	541	-
Consumer welfare	-126	1035	-813	-
Government savings	199	-462	0	-
Total	295	116	-272	139

[5] Government net expenditures decline because the reduction in domestic support (mainly deficiency payments), due to slightly higher farm prices, exceeds the loss of tariff revenue.

Model results show that with an FTA, the prices of agricultural commodities in Mexico would fall, in aggregate. As a result, Mexican consumers and intermediate demanders of feed grains would experience a substantial welfare gain and producers would show a loss.[6] The Government would experience a net decline in revenue from loss of tariff receipts and quota rents. The net impact is a small welfare gain for Mexico from its agricultural sector.

Because of somewhat higher world prices, the FTA generates welfare gains to producers and welfare losses to consumers in the ROW. The net result is a small net loss in welfare.

The above welfare changes sum up to a small net welfare gain for the world as a whole. The largest gain goes to Mexican consumers. The largest loss comes from consumers in ROW. The magnitudes of net gains are very small, as is usually the case with static world trade models. To reiterate an earlier point, important potential sources of dynamic welfare gains from reduced trade barriers (such as income growth or economies of scale) are assumed away in this model.

Implications for Commodity Groups

The United States' main farm exports to Mexico are feed grains, oilseeds, live animals, meat, and dairy products. These exports likely would expand with liberalized trade. We estimate that grains and oilseeds would account for nearly 90 percent of the expansion in U.S. agricultural exports (Table 16). With the increase of exports to Mexico, total U.S. agricultural exports to all countries, would increase less than 2 percent.

Mexico's main exports to the United States are tropical and specialty crops such as coffee, fruits, and vegetables, as well as live animals. Horticultural products would account for well over half of Mexico's expansion of exports to the U.S. There would also be increases in Mexican exports of feeder cattle.

[6] Welfare changes are not reported for the Mexican cattle sector. The reason for this omission is that the cattle market is segmented, a characteristic which is not adequately captured in our modeling framework. Essentially, feeder cattle located in the northern states are the only tradable segment of the market. Cattle produced primarily for domestic use are considered to be non-tradable.

Our model includes all Mexican cattle, creating the impression that the removal of an export tax directly affects the entire cattle stock. Thus, there is a substantial overstatement of the welfare gains to producers and losses to consumers. There also would be an overstatement of the changes in cattle trade but we lowered the supply and demand elasticities to reflect the inclusion of the entire cattle stock rather than the tradable segment of the feeder herd.

Table 16--Changes From BASE in Agricultural Exports by Commodity Group, Scenario 1 (FTA)

Exporter	Importers: U.S.	Mexico	ROW	Total Exports
		--million dollars--		
United States:				
Grains/oilseeds	-	430	-61	369
Livestock/meats/dairy	-	49	0	49
Horticulture	-	1	2	3
Other	-	3	-1	2
Total	-	482	-59	423
Mexico				
Grains/oilseeds	2	-	9	11
Livestock/meats/dairy	56	-	0	57
Horticulture	104	-	-6	98
Other	3	-	2	5
Total	166	-	5	171
Rest-Of-World				
Grains/oilseeds	12	-38	-	-25
Livestock/meats/dairy	5	0	-	5
Horticulture	-16	0	-	-15
Other	3	-1	-	-1
Total	3	-39	-	-36

The FTA examined here implies a small (less than 1 percent) net expansion in U.S. agricultural production. Producers of some commodities such as feed grains would expand production. Producers of some commodities such as certain horticultural products, would slightly reduce pollution. No horticultural product in the model showed a production decline in excess of 2 percent.

The expansion of U.S. production of export-oriented commodities would be small because agricultural exports to Mexico represent a small proportion of U.S. production. Corn is a good example. Corn exports to Mexico are estimated to increase about 65 percent due to the removal of Mexican border restrictions. The increase in U.S. corn exports to Mexico is large in Mexico's frame of reference, equivalent to 17 percent of Mexican corn consumption. But these large percentage changes only represents a 3-percent increase in total U.S. corn exports and less than a 1 percent increase in production.

The impact of scenario 1 on the trade flows of frozen concentrated orange juice (FCOJ) illustrates trade diversion and trade creation. A U.S. import tariff equivalent of 28 percent was removed from FCOJ imported from Mexico. Model results show an increase in U.S. consumption of 6 thousand tons and a reduction in U.S. production of 2 thousand tons (about a 0.25 percent decline) as a result of a slightly lower domestic price. Imports increased 8 thousand tons (1 percent). Mexico's exports to the U.S. increased 12 thousand tons (32 percent) but ROW (primarily Brazil) decreased exports to the U.S. by 4 thousand tons (0.5 percent). By removing the tariff on FCOJ, the United States created additional trade of 8 thousand tons, and diverted 4 thousand tons of imports from Brazil to Mexico. There is almost no trade diversion in any other commodity.

The impact of scenario 1 on two-way trade for an individual good is illustrated by live cattle. With the removal of protection (import tariff and export tax), Mexico moderately increases its purchases of U.S. slaughter cattle and significantly increases its exports from approximately 850 thousand head in the base period to 1050 thousand head. The Mexican cattle, which fall in price by about 10 percent, are moved to the United States for feeding purposes. Once fed, some of the cattle return to Mexico for slaughter and some are slaughtered in the United States. The U.S. exports more beef to Mexico, approximately a one-third increase from the base period.

Sensitivity Analysis

From a U.S. perspective, corn trade dominates the aggregate results presented above. Two modifications are made in scenario 1 to see how sensitive the results are to changes in assumptions relating to Mexican corn. First, (scenario 1a) we examine modifications in Mexican domestic policy toward corn, other coarse grains, and soybeans as part of an FTA. We assume that Mexican producer (input) subsidies are set equal to U.S. producer subsidies (mainly deficiency payments) on a per unit basis. (The model treats the effects of input subsidies and

deficiency payments equally.) This represents a 30 percent reduction of Mexican domestic crop support in addition to the removal of the import tariff equivalents. Results show a 8-percent increase in the growth in U.S. exports of grains and oilseeds compared to scenario 1. Other trade adjustments are minor. The absolute value of all welfare impacts are marginally reduced.

In addition to the assumptions in scenario 1a, we reduced the elasticity of substitution in consumption of Mexican corn for U.S. corn from 3 to 1 (scenario 1b). This reduction assumes that Mexican consumers are less willing to substitute yellow corn for white corn in their diet. Hence, the increase in demand for U.S. corn by Mexicans, due to an FTA, is diminished and there is a smaller price increase of U.S. corn.

Results show that the assumptions of scenario 1b reduce the response of U.S. grain/oilseed exports to Mexico, due to the FTA, by over 20 percent relative to results in scenario 1. U.S. welfare estimates (shown in table 15 for scenario 1) are reduced by nearly 50 percent as the gains to farmers and savings by government are lessened. However, total welfare changes in Mexico are nearly the same as in scenario 1. These changes in assumptions reduce the price responsiveness of Mexico's demand for U.S. corn. Thus the trade and welfare responses to an FTA in the U.S. and ROW are sensitive to these changes, but Mexican welfare is not.

These two sensitivity experiments show that the aggregate results are moderately sensitive to assumptions about corn policy and consumption in Mexico.

One further experiment (scenario 1c) is conducted to provide sensitivity analysis on changes in income resulting from an FTA. The opening of the Mexican economy by reducing state-owned enterprises, government regulation of industry, and government intervention in commercial policies may encourage investment, employment and economic growth in Mexico. Higher growth rates lead to increases in disposable income available to purchase domestic and foreign goods.

In our partial equilibrium analysis economic growth is not endogenously modeled. However, an exogenous estimate of change in income can be included in the commodity demand equations. Some of the general equilibrium analysis indicate that Mexican and U.S. income growth resulting from an FTA would be less than 1 percent (see previous section). Kehoe suggests that these models understate the income effect because they do not consider the rate of growth varying endogenously with changes in government policy. An opening of the Mexican economy would promote endogenous technical change due to specialization in product lines and increase worker experience. He claims that Mexico could attain as high as a 25 percent increase in output per worker over a 25 year period, approximately 1 percent per year.

Scenario 1 implicitly assumes that there are no changes in income for the U.S. or Mexico. In scenario 1c we assume that Mexican income increases 10 percent and there is no income

change in the U.S. Scenario 1c roughly parallels Kehoe's hypothesis over an intermediate run. All other policy assumptions in scenario 1c correspond to scenario 1.

Our results indicate that with higher income growth, Mexico would become an even larger net importer of agricultural products than shown in scenario 1. With income increasing in Mexico there is an expansion in demand for both domestic and foreign agricultural products. Mexico has less available for foreign sale and hence, their agricultural exports to all sources decline 65 percent relative to scenario 1. On the import side, Mexican purchases from the United States increase 30 percent compared to scenario 1. The largest increases (90 percent) are in meats.

Scenario 2: Unilateral Trade Liberalization in Mexico

This scenario leads to an expansion of Mexican imports of agricultural commodities of the same magnitude as with an FTA – with the U.S. capturing most of that increase (Table 14). But Mexican exports increase very little, mainly because U.S. trade barriers do not change in this scenario. The value of world agricultural trade increases somewhat less than with the first scenario.

Welfare gainers and losers in the U.S. and Mexico are the same as in the first scenario – only more so (Table 15). U.S. producers enjoy the benefits of expanded exports to Mexico without facing lower border protection on imports from Mexico. Mexican producers are worse off than in the first scenario, but consumers are better off. Consumers benefits from no increase in prices of those commodities that Mexico would export with an FTA.

Model results show the United States obtaining most of the world's net welfare benefits from this scenario.

Scenario 3: Mexico Has an FTA with the U.S. and Unilateral Trade Liberalization With All Countries

Changes in agricultural trade among the 3 country/regions, caused by the combined impact of the two assumed border policy changes, look quite similar to the results obtained from the first scenario – an FTA only (Table 14). ROW, through, increases its agricultural exports because of the open access to the Mexican market.

Changes in welfare within and between the 3 country/regions also are quite similar to those of the first scenario (Table 15).

A comparison of scenario 3 with scenario 1 indicates that a U.S.-Mexican FTA has a relatively large impact on U.S.-Mexican agricultural trade. However, the additional impact that

could be obtained from Mexico removing agricultural trade barriers with all other countries is quite small. The ROW would not be affected much by either policy change in Mexico.

A comparison of this scenario with scenario 2 gives an indication of the impact of a U.S.-Mexican FTA after Mexico would unilaterally remove border protection with all countries. As expected, the additional impact of the FTA is to remove U.S. border protection and enable Mexican exports to the U.S. to expand. Having this market access to the United States is a critical aspect for Mexico. However, U.S. exports remain virtually the same as in Scenario 2. There is a very small net increase in welfare, compared with scenario 2, for the agricultural sector in both the United States and Mexico.

Conclusions

- The total removal of border protection (scenario 1) provides an upper bound estimate of the intermediate-run impact of an FTA on U.S. and Mexican agriculture and agricultural trade. Bilateral trade is estimated to increase by 15 percent. Relative to the size of the two agricultural sectors, however, the overall impact is very small for U.S. agriculture but somewhat more significant for adjustment of Mexican agriculture.

- Unilateral Mexican trade liberalization generates about the same overall magnitude of impact on U.S. agriculture as the FTA. For Mexico, the FTA has the additional benefit of access to the U.S. market. If Mexico were to continue to liberalize its trade prior to putting an FTA in place, then the additional economic impact of the FTA would be reduced.

- The size of the overall impact of the FTA also will be affected by to what extent Mexican domestic policy modifies its support for consumers and producers of staples such as corn. These decisions could have a large impact on the potential U.S. gains in agricultural exports, and on adjustments that would need to be made by Mexican farmers.

- The results are moderately sensitive to the assumed rate of substitution of yellow corn for white corn in Mexican consumption, and to the amount of aggregate income growth that Mexico might gain from an FTA.

- Impacts measured here are limited to what could be included in the model. For example, the endogenous effect of an FTA on Mexican income growth, and ultimately on growth in demand, is not measured. And probably even more important, this research says nothing about the political impact of an FTA. An FTA might foster a more stable economic environment in Mexico. These two factors suggest that the impact of an FTA could be larger than measured here.

6. Exchange Rate Policy and the Free Trade Agreement

Exchange rate policy is relevant to the FTA because restrictions on the price and use of foreign currency can be used to substitute for tariffs and import quotas. Thus, an agreement to limit the use of tariffs and quotas could be negated by the use of exchange controls. For example, agricultural imports could be restricted by at 10% tariff when there is a single peso/dollar exchange rate and Mexicans are free to spend dollars on any import. Instead of a tariff, the Mexican government could restrict convertibility of pesos into dollars and require that importers of agricultural products pay a 10% premium for their dollars. This use of exchange controls would circumvent a free trade agreement. Frequent use of exchange controls by Mexico in the past makes the issue more important than it was for the U.S. – Canada agreement.

A second connection between exchange rates and the free trade negotiations involves the calculation of tariff equivalents and producer subsidy equivalents. Some exchange rate is necessary to convert world prices into domestic currency prices, and, in the presence of exchange controls use of the official exchange rate may produce misleading results.

There are grounds for Mexico's trading partners to object to the use of exchange controls even if importers are eligible for a more favorable exchange rate (fewer pesos per dollar) than importers of other products, i.e., agricultural imports are subsidized. Arbitrary changes in the administration of multiple exchange rates could suddenly remove the eligibility of products that had been eligible for a favorable exchange rate. Rationing foreign exchange is an additional problem for importers. If an importer is denied access to foreign exchange at the official rate, he may be forced to pay a higher price for foreign exchange in the black market that he would have paid under a free float. The black market exchange rate may be the de facto marginal cost of agricultural imports.

Mexico maintained a rigidly fixed exchange rate of 12.5 peros per dollar from 1954-76. The peso was devalued in 1976 and again in 1977. The Mexican foreign debt crisis reached its peak in 1982 (Cardoso and Levy). Dollar amounts in Mexico became payable only in pesos and all private banks were nationalized. The peso was devalued again in 1982 and a two-tier exchange rate was implemented. Mexican inflation reached its peak in 1983 at 102%. From 1985-88 there were three exchange rates in existence: a controlled rate, an official "free" rate, and a parallel or black market rate. In 1987, the peso reached its minimum value in the black market at 3350 pesos per dollar. Following the inauguration of President Salinas in 1989, Mexico moved toward a unified exchange rate system.

With respect to the free trade agreement, it is important to distinguish between two concepts of currency misalignment. Multiple exchange rates or direct rationing of foreign exchange for particular uses can be used to substitute for tariffs and import quotas. However, these policies require restrictions on the quantity of foreign exchange purchased by importers and its use, i.e., exchange controls. Currency misalignment in this first sense can be detected by

the presence of exchange controls. Without exchange controls a single market-clearing exchange rate will emerge. Because of Mexico's past use of exchange controls, it is reasonable to expect its partners in the FTA to request some assurances that exchange controls will not be used against them. Enforcement of an agreement is made easier by the fact that exchange controls are easy to detect.

However, the term currency misalignment has also been used in a second sense. A currency may be misaligned if the actual exchange rate differs from a country, whose currency is floating freely and whose residents are free to buy any quantity of foreign exchange for any purpose may have an overvalued or undervalued exchange rate in this sense. Many observers were convinced that overvaluation of the U.S. dollar from 1980-85 restricted U.S. exports and encouraged U.S. imports (Schott, p.7). A fundamental problem with this notion of misalignment is that it depends on a model of exchange rate determination, and there is no professional consensus as to which model is best (Meese). Therefore, the measure of misalignment is not unique, and there are no clear of a free trade agreement cannot be asked to avoid misalignment in this second sense without agreeing on the appropriate exchange rate model, and selecting the appropriate model would be a formidable task for trade negotiators. Consequently the U.S. – Canada free trade agreement contains no provisions on exchange rates. The task of monitoring exchange rates was left to finance officials of the two countries and the International Monetary Fund (Schott).

Measuring misalignment in the second sense involves problems in addition to agreeing on the appropriate model. For example, consider the oldest and most popular exchange rate model, Purchasing Power Parity (PPP). First, measured misalignment varies with the base year chosen. Second, there is a different PPP measure for each type of price index used. Third, for a multilateral exchange rate index the degree of misalignment varies with the trade-weighting scheme used. The practical significance of these points will be illustrated using Mexican data.

Define the exchange rate (E) as pesos per dollar so that an increase indicates depreciation of the peso. The nominal exchange rate predicted by PPP for a given year is the exchange rate in the base year adjusted for relative inflation rates in the home and foreign countries between the base year and the current year. For example, the nominal exchange rate predicted by PPP for 1989 for Mexico relative to the base year 1962 is:

$$\hat{E}_{89} = \frac{E_{62}\ (P^{M}_{89})}{P^{M}_{62}} \div \frac{P^{U}_{89}}{P^{U}_{62}}$$

The predicted value for the exchange rate in 1989 (E_{89}) is 2114.5 pesos per dollar and the actual rate was 2461.50 pesos per dollar. An index of the change in the real exchange rate is the ratio of the predicted rate to the realized rate:

$$IRER = \frac{E_{89}}{\hat{E}_{89}}$$

When this index value is calculated using consumer prices for the bilateral peso/dollar exchange rate, its value for 1989 is 1.16, an interpretation is that there has been a 16% real depreciation of the peso depreciated 16% more than the Mexican-U.S. price level differential during the same period. A value less than one implies real appreciation of the peso. A value of unity means there has been no change in the real rate, i.e., the nominal rate has followed PPP exactly. A time series for the bilateral rates using consumer prices is shown in column one of Table 17.

A possible interpretation of the 1989 value is that the peso was undervalued relative to the base year 1962, i.e., the peso should appreciate until the index value returns to unity. A problem with this interpretation is that the conclusion about the value of the peso in 1989 can be reversed by choosing 1986 as the base year, or even greater degree of undervaluation can be found by choosing 1981 as the base year as shown below:

	1989 Rate Predicted by PPP (peso per $)	1989 Actual Rate peso per $)	1989 IRER
1962 base	2114.5	2461.50	1.16
1981 base	1676.1	2461.50	1.47
1986 base	3224.8	2461.50	0.76

The realized peso/dollar rate of 2461.50 us either 47% too high, 16% too high or 76% of the equilibrium value, depending on the base year chosen. Alternatively the nominal peso/dollar rate consistent with PPP is either 3224.8, 2114.5, or 1767.1. Such a broad range does not provide much guidance to policy makers. In principle, one should choose a base year when the exchange rate was in equilibrium, but this is easier said than done. In general, choosing a base year with a large predicted rate (like 1986) produces a smaller IRER for subsequent year (like 1989) and makes the currency look undervalued in the later year. The dependence of the PPP real rate on the base year is well known, but it has considerable practical importance in the case of the peso/dollar rate.

A second difficulty with the PPP real rate is that it varies with price indexes and weighting schemes. Price levels can be measured at the consumer or wholesale level and the indexes are not perfectly correlated. In addition, one can calculate a bilateral peso/dollar index or a multilateral index of the peso against an average of its main trading partners. Furthermore, the multilateral trade-weighted index can be calculated as an arithmetic mean or as a geometric mean. Six PPP real exchange rate indexes are shown in Table 17. Columns 1-2 are bilateral indexes using consumer and wholesale indexes. Columns 3-4 are multilateral indexes against Mexico's ten largest trading partners using arithmetic means. Columns 5-6 are the same as 3-4, but they are based on geometric means.

Table 17. Mexican Real Exchange Rate Indexes: 1962-88*

	(1) BC	(2) BW	(3) MCA	(4) MWA	(5) MCG	(6) MWG
1962	1.00	1.00	1.00	1.00	1.00	1.00
1963	1.01	0.99	1.02	1.00	1.02	1.00
1964	1.00	0.95	1.01	0.98	1.01	0.98
1965	0.98	0.95	1.01	0.99	1.01	0.99
1966	0.97	0.97	1.00	1.02	1.00	1.01
1967	0.97	0.95	1.00	0.99	1.00	0.98
1968	0.98	0.95	1.02	1.01	1.01	0.99
1969	1.00	0.96	1.04	1.03	1.03	1.01
1970	1.01	0.95	1.05	1.02	1.04	0.99
1971	1.00	0.94	1.04	1.01	1.04	0.99
1972	0.98	0.95	1.04	1.04	1.05	1.03
1973	0.93	0.93	1.00	1.01	1.03	1.03
1974	0.84	0.91	0.91	0.96	0.93	0.98
1975	0.79	0.89	0.88	0.92	0.90	0.95
1976	0.72	0.76	0.81	0.79	0.82	0.80
1977	1.08	1.04	1.25	1.08	1.25	1.09
1978	1.00	0.98	1.16	1.00	1.18	1.03
1979	0.94	0.93	1.10	0.93	1.12	0.97
1980	0.85	0.86	0.99	0.84	1.00	0.86
1981	0.78	0.80	0.91	0.77	0.83	0.77
1982	1.20	1.21	1.41	1.16	1.20	1.13
1983	1.31	1.26	1.57	1.21	1.26	1.16
1984	1.16	1.06	1.39	1.02	1.07	0.96
1985	1.16	1.05	1.41	1.02	1.04	0.95
1986	1.51	1.29	1.87	1.26	1.42	1.23
1987	1.52	1.26	1.89	1.23	1.43	1.24
1988	1.22	1.04	1.50	1.01	1.11	1.03
1989	1.16	1.04				

*An increase in the index means real depreciation of the Mexican peso.

Columns (1) and (2) are bilateral with the U.S. dollar. (1) uses consumer prices and (2) uses wholesale prices. Columns (3)-(6) are multilateral against Mexico's 10 largest trading partners. Columns (5)-(6) are geometric means using consumer and wholesale prices, respectively.

All six indexes show the same broad pattern for the peso from 1962-1988. In most cases if an entry is greater than one for a given year, so are the other entries for the same year. The year 1979 is an exception. In addition, the years 1976, 1981, and 1985 represent local minimum values for the RERs for all six measures. Since these years were followed by large real depreciations of the peso, a common interpretation is that these were years of significant overvaluation of the peso.

Another general pattern is that prior to 1973 there were no substantial deviations (greater than .05) in either direction, regardless of which index is used. However, beginning in 1973, deviations greater than .05 were common for all six indexes. The extreme years were 1981, when five of the six indexes showed overvaluation of at least 20% and 1986-87, when all six indexes showed undervaluation of at least 17%.

Beginning in 1973, the indexes showed greater differences among themselves in addition to greater deviations from unity. In 1984, the multilateral consumer arithmetic index was 1.39, but the multilateral wholesale geometric index was only .96. In 1987, the bilateral consumer index was 1.52, but the bilateral wholesale index was only 1.26. This difference occurred in 1987 although the two indexes had a correlation coefficient of .96 for the entire period, 1962-88. (See Table 18.) In 1988, the bilateral wholesale index was 1.04 and the multilateral wholesale index was 1.01, but the multilateral consumer arithmetic index was 1.50. For these years policy makers seeking guidance about the degree of misalignment faced a considerable range of values. During the Bretton Woods period when RERs were stable, the choice among alternative RER measures was not an important issue. However, it has become more important during the floating rate period as RERs have become more volatile.

Table 18. Correlation Coefficients Among Real Exchange Rates for Mexico: 1962-1988

	BC	BW	MCA	MWA	MCG	MWG
BC	1	.96	.97	.90	.97	.87
BW		1	.92	.95	.91	.91
MCA			1	.81	.99	.78
MWA				1	.83	.97
MCG					1	.82
MWG						1

See Table 17 for definitions.

Thus several measures of equilibrium exchange rate can be calculated using the PPP model. A more fundamental problem with PPP is whether is conforms with real world data. Unfortunately, two standard empirical tests using Mexican data produce conflicting results for PPP. (See Fleissig and Grennes.)

A partial adjustment model (see Edwards) was used for Mexico for the period 1962-88. An elasticity of the nominal peso/dollar exchange rate with respect to the relative Mexican and U.S. price levels was found to be insignificantly different from unity in the long-run. Thus, PPP was consistent with Mexican data in spite of occasional short-run deviations. An alternative test asks whether the Mexican RER follows a random walk as deviations from PPP will not be corrected in the long-run. Using the same bilateral Mexico-U.S. data for the same time period as the previous test PPP was strongly rejected. These contradictory results make it difficult to judge the empirical validity of PPP.

Since exchange rate misalignment can be used to substitute for tariffs and quotas, it is appropriate to ask members of a free trade agreement to avoid misalignment that requires the use of exchange controls. However, it prudent to exclude from the negotiations the second more elusive the misalignment. The problems of selecting a model, empirically verifying a model, and choosing among alternative measures of misalignment for a given model are formidable.

7. Reform of the Mexican Land Tenure System

The current system of land tenure in Mexico directly restricts the ownership of agricultural land. Indirectly the land tenure system influences the use of land, labor, capital, and technology in Mexican agriculture depends on whether it is accompanied by reform of the land tenure system.

The Mexican countryside represents one of the major challenges and one of the major opportunities for Mexican economic development. At the beginning of this century, Mexico was dominated by large haciendas, but now the average size farm is so small that it is difficult for individual farmers to earn a living. The free trade agreement presents an opportunity for reform that would increase the productivity of land and workers.

The forces that gave rise to the ejido system are no longer present. In the 1930s landlords were resisting development of a modern state as well as a modern industrial economy. In contrast, a major problem in the countryside today is a land tenure system characterized by small inefficient plots of land (minifundio). In the 1930s land was the abundant factor and labor was scarce, but the relative scarcities have been reversed in recent years.

The Mexican Revolution of 1910-17 did not give land to landless farmers immediately. In 1937, twenty years after the revolution, land reform occurred. The ejido system, a distinctively Mexican institution, emerged. The ejido was originally planned as a transitory form of land tenure. Over time the rules have become rigid, and the system has become a mechanism for permanent state control of the farmers, the ejidatarios.

Members of the revolutionary peasant movement were not fighting for ejidos, but for rights to private property that would allow landless people to earn a living. However, ejidatarios today are not able to earn a decent living solely from their ejido activity. Ejido families earn an average only of 40% of the minimum wage. Given the small size and low quality of ejido land, families are not able to work full-time on ejidos.

As even marginal land became unavailable for distribution, the government began to distribute land that was not suited for agricultural use. This policy was a response to rural unrest due to lack of employment opportunities. By law the government must give at least ten hectares of irrigated land or its equivalent in rainfed land to each landless peasant.

In order to prevent concentration of land ownership from occurring again, the government imposed restrictions on ejidos. Selling and renting land were prohibited, and ejidatarios were forbidden from hiring paid workers. Conversion of crop land to pasture is restricted. The government is directly involved in the economic and organizational activities of the ejidos and it has obtained control over the lives of nearly three million ejidatarios. Recently the ruling political party (Partido Revolucionario Institucional) received 81% of its votes from rural areas.

The main contradiction of the ejido is that it is simultaneously a production unit and a political control system. As a result, economic rationality is subordinated to political expediency. If the government wants to keep the ejido as a rural production organization, it is necessary to give it greater autonomy. In order to develop democracy in the ejidos, it is necessary to convert them into free agricultural producer associations. The future of the ejido depends on this decision.

More than 75 years after the Mexican revolution, land tenure is worse than it was at the beginning of the century. Although 90 million hectares (almost half of Mexican territory) have been distributed to landless peasants, there are still four million landless people, more than at the beginning of the Revolution. Most of the land holdings (70%) are considered subsistence in the sense that they cannot generate enough income to support a family.

Ejidos are economically inefficient institutions, and ejidatarios lack the opportunities and incentives to change them (Morett Sanchez). They lack modern technology. Most ejidos (57%) do not have a single tractor. Ninety percent have no industrial equipment and only 16% of the land is irrigated. Access to credit is extremely limited. The majority of forest land belongs to

ejidos, but only 18% of them are involved in forestry activities. One-third of ejidos lack electricity, more than half do not have running water, 80% lack paved roads, and 40% use wood as the main fuel source. Most ejidos do not function as integrated production units but as isolated small plots whose usefulness depends on secret and illegal rental arrangements.

Renting and buying land was reported by 60% of the officers of ejidos, but investments are inhibited because of the insecurity of claims to land. Ejidatarios want greater independence from government control, and their transformation into efficient economic units depends on it. The ejido system needs more flexibility; a small and strong ejido system is better than a large, weak one.

Most ejidos are located in the south central region of the country, where 52% of the ejidos are concentrated in ten of Mexico's 32 states. Ninety seven percent of the arrangements are individual ejidos in which every ejidatario is responsible for one plot of land. In 65% of the ejidos corn is the main crop followed by sorghum 7%, beans 5%, sugar 4%, wheat 3% and coffee 3%. The main buyers from ejidos are rural middlemen and CONASUPO. Although federal agrarian law prohibits the use of hired workers by ejidos, 64% use hired employees (Morrett Sanchez).

Although penalties against renting ejido land are strong (including loss of agrarian rights), in the majority of ejidos renting land is a normal practice. Sharecropping is the rental arrangement for 60% of the corn and beans that are produced. Reasons given for renting vary, but they include lack of financial resources (51%), death of a husband, illness, aging (20%), and emigration (8%).

In the poor areas land is usually rented to other ejidatarios, but in rich areas it tends to be rented to outsiders. Then land is rented, it is auctioned to the highest bidder at a public meeting of ejidatarios. The land is mostly rented in irrigated areas where, in some cases, the entire ejido is rented as in Baja California, Sonora, Sinaloa, Michoacan, and Guerrero.

For watermelon and cantalope production the ejido land is rented by foreigners, mainly Americans and Japanese. In most cases, the ejidatarios rent both their labor and their land, which allows them to supervise the use of the land. In poor areas ejidatarios sometimes offer free rent rather than allow the land to go idle, but they may receive no offers.

Widespread evidence of violating rules on renting land and hiring labor indicate that the rules are inconsistent with efficient land use. Circumventing the rules reduces the loss from the inefficient land use rules, but it does not eliminate the loss. Circomvention does imply that the necessary adjustment in resource use is smaller than it would otherwise be.

Reform of the ejidos could be accomplished either by modifying the land tenure law or by modernizing the organization without modifying the law. Two solutions that do not seem feasible under current conditions are (1) distributing additional land and (2) total privatization of land. Distributing additional land is limited by the quantity and quality of available land in rural areas. Immediate privatization would be hampered by boundary disputes between and within ejidos and competing claims on common infrastructure. Among the more feasible options is legalizing land rental either within the ejido or to outsiders. A second feasible reform, is to legalize sale of land on a limited basis. An individual could sell his plot to the ejido and capture the returns from his investment in land improvements. This option would encourage investment and avoid deterioration of the land. A variation on this idea is to allow sale to other small landowners, perhaps those owning no more than twenty hectares.

State control of ejidos could be avoided by granting private ownership to the group rather than to individual ejidatarios. The advantage of economies of scale could be achieved.

A final option is for the government to allow the voluntary decisions of each ejidatario to change the ownership pattern to private property rights. This approach would stimulate investment. Here a possible restriction is that an ejidatario could sell his land no sooner than X years after acquiring it. The transition period to potential private ownership would provide time to resolve legal and technical problems related to competing claims. In November 1991, President Salinas proposed major reform of ejidos to the Congress.

The benefits of a free trade agreement would be greater if ejido reform also occurs. Reform would allow Mexican agriculture to respond more quickly and more completely to the dynamics of international markets. Without reform, land use cannot be changed from crops to pasture. Without reform, even people cannot move freely because they may lose their claim to land if they do not remain near it. A freer labor market might allow people to earn a living on small plots used for commercial crops, such as cut flowers. Removing impediments to using the most efficient combination of land and labor would stimulate investment in Mexican agriculture and encourage the use of modern technology.

8. The Effects of Adding Countries to a Free Trade Agreement

The effect of a bilateral free trade agreement was analyzed in section five. In general, the effect of any preferential trade arrangement depends on whether the lowest cost countries are included in the arrangement. This section analyzes the effect on trade of adding other Western Hemisphere countries to the bilateral trading arrangement.

Since the end of the Second World War, the United States has been a major proponent of multilateral trade negotiations under the auspices of the General Agreement on Tariffs and Trade

(GATT). More recently, the United States also has shown interest in preferential trading arrangements (PTAs). Of the more than 70 PTAs that have been reported to the GATT since 1947, the United States is a participant in only two. However, these were initiated during the last ten years, and the United States concluded a PTA with Israel in 1985, with Canada in 1989, and is currently negotiating with Mexico and Canada for an extended PTA. The United States also launched the Caribbean Basin Initiative, and the Enterprise of the Americas Initiative (EAI), in order to eventually create a Western Hemisphere Free Trade Zone. As part of the EAI, the United States will pursue discussions for a PTA with Chile, and has signed a framework treaty with MERCOSUR, CARICOM, and other Latin American countries, to strengthen trade and investment in the region.

The United States is not the only country interested in developing PTAs. MERCOSUR, the Southern Cone Common Market, was founded in March 1991, by Argentina, Brazil, Paraguay, and Uruguay. In September 1991, Mexico and Chile reached a settlement on a free trade pact and both countries are exploring other relationships. The Andean countries, Venezuela, Columbia, Peru, Ecuador, and Bolivia also have agreed to eliminate tariffs and pursue a common price stabilization scheme.

Several issues may arise pending formation of various trade arrangements. The most obvious questions are "who experiences trade increases and who attains welfare gains?" To try to answer these questions, we first need to look at the type of trading arrangements that might be formed. In a recent article by Richard Lipsey entitled, "The Case for Trilateralism," Lipsey outlines three models of PTAs: the hub-and-spoke model, one country, presumably the U.S., has separate bilateral free-trade agreements with each of the participating countries (Wonnacot). For example, the United States would have agreements with Canada, Mexico, and Chile. While the "hub", the United States gains tariff free access to these individual countries (the spokes), the "spokes" only gain tariff free access to the United States. The "spokes" do not realize gains vis-à-vis other spokes.

In the second model, the overlapping regional free trade area, two countries such as the U.S. and Mexico would form a free trade agreement. Other countries might express interest in forming a free trade agreement with Mexico (e.g., Costa Rica and Honduras), while other countries might initiate interest with the United States (e.g., Chile and Israel). A series of overlapping agreements could evolve in which the U.S. and Mexico would be included in some arrangements, while excluded in others.

In the plurilateral regional model, several countries would establish a regional free trade area in which all members received tariff-free access to the markets of all other members. This stands in contrast to the hub-and-spoke model in which only the hub country had tariff free access to the markets of all the spokes. Instead of the United States having separate bilateral agreements with Canada and Mexico, these three countries would sign one agreement establishing common access to each other's market – a North American Free Trade Area (NAFTA). Any other countries interested in joining the regional arrangement would conform with the terms of NAFTA. A country, such as Chile, may want to "sign-up" with NAFTA.

The United States, Canada, and other Western Hemisphere countries have expressed the most interest in plurilateral regional arrangements. Nevertheless, participation and the process of negotiation seems to be uncertain at the present time. In this section, we examine the hub-and-spoke and various plurilateral regional models for a single agricultural commodity, wheat. We choose wheat to serve as an example because it is an important export commodity for three Western Hemisphere countries, the United States, Canada, and Argentina, and an important import commodity for several other Western Hemisphere countries.

Wheat Trade Flows of Western Hemisphere Countries

Examining the 1987 trading patterns provides a good basis for determining the qualitative importance of various preferential trading arrangements. The data suggest that any type of agreement would have small effects on the United States and Canada, but would be more significant for Argentina, Brazil, Mexico, Chile and Colombia depending on the type of arrangement.

Of the Western Hemisphere countries considered, three are exporters and four are importers. The United States, Canada, and Argentina are major world exporters with shares of world wheat trade of 34, 17 and 5 percent, respectively. In contrast, the importing countries have very small shares of the world import market: Brazil has approximately 3 percent, Mexico and Colombia 0.5 percent, and Chile a negligible percent. The importance of these importing countries to the three exporters also tend to be small with one exception; 27 percent of Argentina's exports are purchased by Brazil (see Table 19).

Table 19. Wheat Trade:
Exports as Percent of Total by Country

IMPORTER

Exporter	MX	BZ	CH	CO	RW	Percent of Total Exports
United States	0	0	0	1	99	100
Canada	1	4	0	1	94	100
Agrentina	0	27	0	2	71	100

From the importer's perspective the three exporting countries are critical (see Table 20). Mexico, Brazil, and Colombia rely on the United States, Canada and Argentina for approximately 70 percent of their imports. Mexico imports mostly from Canada, Brazil imports mostly from Argentina, and Colombia imports mostly from the United States. Chile imports

almost all its wheat from the United States. Since the bilateral trading patterns are different across the exporters and importers, "who is in and who is out of an agreement" could lead to significant changes in the pattern of trade.

Table 20. Wheat Trade: Imports as Percent of Total by Country

IMPORTER

EXPORTER	MX	BZ	CH	CO
United States	25	4	89	37
Canada	44	30	0	23
Argentina	0	40	0	9
Rest of World	31	26	11	31
Percent of Total Imports	100	100	100	100

Simulation Analysis

In order to quantify the effects of various preferential trading arrangements we constructed a wheat model for eight countries using the SWOPSIM – Armington framework. The results describe the impact of various regional arrangements for a typical year after each scenario is fully implemented and the agricultural sectors of the participating and non-participating countries have had several 1987-like years in which to adjust.

Five simulation experiments are undertaken to reflect different country participation in PTAs (see Figure 9). In the experiments all import policies are removed for trade with other participating countries. U.S. and Canadian wheat program and Argentine export taxes are assumed to continue at the 1987 subsidy (tax) levels. The quantification of import policies, is based on PSE/CSE calculations (Webb et al.) and includes all policy transfers to producers through price intervention (e.g. tariffs and import licensing). Brazil, Mexico, Chile and Colombia have import tariff equivalents of 50, 5, 40 and 40 percent, respectively. Thus, we would anticipate that the removal of protection by Brazil would have the largest import effect, other things being equal.

Figure 9. -- A Schematic of Preferential Trading Arrangements

Experiment 1: {US - Mexico}

Experiment 2: {NAFTA: US - Mexico - Canada}

Experiment 3: {NAFTA: US - Mexico - Canada}
{MERCOSUR: Argentina - Brazil}

Experiment 4: {Hub-&-Spoke: US - Mexico
US - Brazil
US - Colombia}

Experiment 5: {WHFTA: US - Mexico - Canada - Chile -
Argentina - Brazil - Colombia}

Experiments illustrate how different PTAs in the Western Hemisphere might affect a major traded commodity.

Results for each of the following experiments are reported as percent changes from actual conditions in 1987 (i.e., changes from the 1987 base solution). In experiment 1 we assume that the United States forms an agreement with Mexico. This is modeled by removing the price wedge that represents Mexican import restriction for U.S. wheat. The elimination of Mexican border protection reduces the domestic price in Mexico of U.S. wheat. U.S. exports to Mexico expand 20 percent from 1987 base period (Table 21). Since Mexico is a small importer of wheat the increase in total U.S. wheat exports is negligible (indicated by a 0.1 percent in the column labeled WORLD). There is almost no effect on any other country and hence there is negligible trade diversion.

Table 21. U.S. - Mexico Experiment 1
Percent Change from Base Value

IMPORTER

EXPORTER	MX	BZ	CH	CO	RW	WORLD
US	20.1					.1
CN	-1.0					.0
AZ						.0

Code: MX - Mexico
BZ - Brazil
CH - Chile
CO - Columbia
RW - Rest of the World
US - United States
CN - Canada
AZ - Argentina

In experiment 2, the United States, Mexico, and Canada form an agreement and Mexico eliminates border protection on wheat imports from the United States and from Canada. Once again, this reduces the Mexican domestic price of wheat providing the incentive to increase wheat imports from the United States and also Canada. U.S. and Canadian wheat exports to Mexico expand 18 and 12 percent, respectively (Table 22). The advantage to Canada in participating in the agreement, therefore, is to increase its export share to Mexico. In this sense a plurilateral regional arrangement is preferable to hub-and-spoke (see experiment 4). However, since Mexico is a small importer of wheat, the increase in total U.S. and Canadian wheat exports is trivial. Once again, there is basically no effect on any other country.

Table 22. NAFTA Experiment 2
Percentage Change from Base Value

IMPORTER

EXPORTER	MX	BZ	CH	CO	RW	WORLD
US	17.9					.1
CN	11.5					.1
AZ						.0

In experiment 3, we assume separate regional agreements among the United States, Mexico and Canada (NAFTA), and Argentina and Brazil (MERCOSUR). The two importing countries, Mexico and Brazil, eliminate border protection vis-à-vis their partners. These policy changes lower the prices of U.S. and Canadian exports to Mexican consumers and the prices of Argentine wheat in Brazil. U.S. and Canadian exports to Mexico increase as before, 18 and 12 percent, and Argentina expands its exports to Brazil by 193 percent (Table 23). Since Brazil is an important importer of Argentine wheat, Argentine total wheat exports expand over 40 percent.

Table 23. NAFTA and MERCOSUR Experiment 3
Percentage Change from Base Value

IMPORTER

EXPORTER	MX	BZ	CH	CO	RW	WORLD
US	17.9	-22.9		1.4	.1	.1
CN	11.5	-22.9		1.8	.4	-.3
AZ		193.3		-5.4	-14.8	40.3

Other countries are effected by MERCOSUR. In removing their import barriers, Brazil increases its demand for Argentine wheat raising Argentine wheat prices. With the increase in price, rest-of-the-world purchases nearly 15 percent less wheat from Argentina and purchases marginally more from the United States and Canada. More importantly, from the perspective of the United States and Canada, both countries wheat exports to Brazil decline 23 percent. Since Brazil is a relatively small importer of U.S. wheat and there is an expansion of U.S. wheat exports to Mexico, Colombia, and the rest-of-the-world, there is a marginal increase, 0.1 percent, in overall U.S. wheat exports. However, Brazil is a relatively large importer of Canadian wheat; the decline in Brazilian imports leads to a marginal decline, 0.3 percent, of total Canadian wheat exports despite the increased purchases by Mexico, Colombia, and the rest-of-the-world.

In experiment 4, a hub-and-spoke arrangement is assumed with the United States as the hub. Each of the four wheat importing countries eliminates their restrictive barriers vis-à-vis the United States. Thus, U.S. exports to Mexico, Brazil, Chile and Colombia become comparatively less expensive in these four countries and there is an increase in demand for U.S. wheat relative to other exporters and domestic producers. U.S. exports increase significantly: 19 percent to Mexico; 292 percent to Brazil; 200 percent to Chile; and 62 percent to Colombia (Table 24). While these changes are large percentages they represent only 1.3 percent increase in overall U.S. wheat exports.

Table 24. Hub-and-Spoke Experiment 4
Percent Change from Base Value

IMPORTER

EXPORTER	MX	BZ	CH	CO	RW	WORLD
US	19.2	291.6	200.0	62.0	-.6	1.3
CN		-3.1		-16.1	.2	-.1
AZ		-3.2		-17.2	.5	-.7

The hub-and-spoke experiment adversely affects Canada and Argentina, albeit marginally. Both of these exporters experience a decline of less than 1 percent of their overall exports.

In our last experiment, a Western Hemisphere preferential trading arrangement (WHPTA) is formed: the NAFTA countries, United States, Canada, Mexico, accept Chile as a member country; the expanded NAFTA signs an agreement with MERCOSUR to remove all import barriers against all member countries; and Colombia joins the agreement (as a representative of the rest of South America).

In WHPTA, the United States expands exports to Mexico, Brazil, Chile and Colombia, experiencing a 1 percent rise in overall wheat exports (Table 25). Brazil accounts for nearly 50 percent of the increase. Canada expands exports to Mexico and Brazil attaining nearly a 2 percent increase in overall exports. Argentina expands exports to Brazil and Colombia reaching

a 28 percent increase in overall exports. Note, however, that WHPTA relative to MERCOSUR, leaves Argentina with a smaller increase in wheat exports. This is not surprising since the United States and Canada compete with Argentina in the Brazilian market.

Table 25. Western Hemisphere PTA Experiment 5
Percent Change from Base Value

IMPORTER

EXPORTER	MX	BZ	CH	CO	RW	WORLD
US	19.9	136.1	200.0	19.5		1.0
CN	11.1	66.6		.0	- .8	1.9
AZ		134.4		10.7	-10.8	28.1

Consistent with the hypothesis espoused by Wonnacott, there are differential effects of a hub-and-spoke compared to a plurilateral regional agreement. U.S. export increases are slightly less with WHPTA than with a hub-and-spoke since the U.S. loses its exclusivity in a WHPTA. As equal participants with the United States in a plurilateral arrangement, Canada marginally expands exports while Argentina significantly gains in their trade patterns.

In all five experiments, the domestic markets of the importing countries are affected. Regardless of participants in the PTA, importing member countries have less than a 4 percent reduction in the production of wheat when import protection is removed (Table 26). There is one exception, Colombia, which has a thin domestic market. On the consumer side, the removal of import barriers raises overall demand in the importing countries. For Brazil, total demand increases 12 percent with a WHPTA.

Table 26. Domestic Production (S) and Consumption (D)
Percent Change from Base Value

IMPORTER

	MX		BZ		CH		CO	
	S	D	S	D	S	D	S	D
Experiment 1	-0.2	0.2						
Experiment 2	-0.6	0.4						
Experiment 3	-0.6	0.4	-0.4	12.0				
Experiment 4	-0.2	0.2	-0.5	2.0	-1.5	2.7	-2.9	10.2
Experiment 5	-0.5	0.3	-0.8	12.3	-1.5	2.7	-7.8	6.7

Conclusion

In this section, we examined the impact of alternative PTAs among Western Hemisphere countries on wheat trade patterns. The wheat market was chosen to illustrate potential trade impacts because it is traded by most Western Hemisphere countries.

The United States and Canada are only marginally affected by Western Hemisphere preferential trading arrangements. Depending on country participation in the PTA, total U.S. wheat exports expand in the range of 0.1 to 1.3 percent. Canadian exports could change from –0.3 to +1.9 percent. Argentina, on the other hand, could gain much more significantly, as high as 40 percent. This reflects the importance of Brazil as an import market for Argentina.

The experiments illustrate how a hub-and-spoke type of PTA would affect trade flows relative to the same countries joining a PTA. The hub-and-spoke expanded exports of the hub (U.S.) more than with a plurilateral arrangement. On the other hand, wheat exporting spokes would export less wheat with a hub-and-spoke than with a plurilateral arrangement.

These wheat experiments also show that as countries are added to an existing agreement all other members are affected, albeit marginally in some cases. Some could expand exports at the expenses of other members.

The trade results from the simulations should be interpreted cautiously. They indicate what might have happened if a PTA existed in 1987 and if all other exogenous variables pertinent to the wheat market remained the same. Since we only considered one commodity, any broad conclusion concerning the benefits of a PTA would be unfounded. To try to develop a fuller understanding of the implications of various PTA arrangements, additional commodities would need to be examined.

9. Conclusion

A free trade agreement would have uneven affects on the three member countries. Mexico would be affected most because of its heavy reliance on trade with the U.S. and because of its initial higher level of protection. Canada would be affected least because it already has access to the American market and because it trades little with Mexico.

The effects of a trilateral agreement are conditional on the outcome of the more ambitious Uruguay Round. The GATT negotiations are considering liberalizing both border measures and domestic policies, whereas the FTA includes primarily border measures.

The effects of unilateral liberalization by Mexico would be nearly as great as the effects of trilateral liberalization. This result is due to the higher initial level of protection in Mexico and the assumption that U.S. domestic policies would remain in place following the relaxation of border measures.

Nearly all the aggregate trade models show increases in real income for all three countries. The volume of trade among member countries will increase, and trade with non-members is expected to decrease by a smaller amount.

Most (90 percent) of the increase in U.S. exports to Mexico will be gains and oilseeds. More than half of the increase in Mexican exports to the U.S. will be horticultural products.

An agreement to refrain from using exchange controls to restrict trade would be consistent with the goals of an FTA, but ambiguity about a broader notion of currency misalignment makes it an inappropriate subject for trade negotiation.

Certain features of land tenure laws are symbols of the achievements of the Mexican revolution. However, current restrictions on ejidos reduce agricultural productivity, and reform of the laws would increase the benefits of trade liberalization to Mexico.

Trade diversion is unlikely to be a serious problem for the FTA. A minor case may be the importation by the U.S. of frozen orange juice concentrate from Mexico instead of from Brazil. The effect of an expanded FTA on members and non-members will vary from product to product. In the case of wheat, the effect on Argentine exports depends heavily on whether Brazil becomes a member of a FTA.

Endnotes

* The views expressed in the paper do not represent the official positions of employers of any of the authors.

1. The Agricultural Cabinet is a committee chaired by the President and including members from the Ministry of Agriculture (SARH), Commerce (SECOFI), Finance (SHCP), Planning and Budget Office (SPP), Agrarian Reform (SRA), the controller General, and two permanent invites, the Directors of CONASUPO and BANRURAL.

2. We would like to acknowledge Liana Neff and Michelle Freitag for their research assistance. We also appreciate the contributions of Vernon Roningen and Peter Liapis.

3. Canada is omitted from this analysis for two reasons. First, an additional country greatly increases the size of a SWOPSIM – Armington model, and second, Canada's impact upon the results for the United States and Mexico are expected to be quite small.

4. Estimates of U.S. income support (mostly deficiency payments), input and marketing assistance, and miscellaneous items included in PSE/CSE calculations are included as wedges in the model. These wedges are assumed not to change in the scenarios. Estimates of domestic subsidies for Mexico are not included in the model (except for corn in scenarios 1a and 1b and, therefore, are assumed implicitly not to change. The absence of these Mexican policies is due to date limitations.

5. Government net expenditures decline because the reduction in domestic support (mainly deficiency payments), due to slightly higher farm prices, exceeds the loss of tariff revenue.

6. The United States and other industrialized countries agreed to provide preferential treatment of imports from developing countries under the Generalized System of Preferences (GSP). These special allowances became GATT legal in 1971 and allowable as long as developing countries are treated equally. However, each industrialized country can determine which countries are developing and what special treatment it will offer. Issues relating to GSP are not addressed in this report.

7. Potential problems with transshipments may occur with the three types of PTAs described. Non-member countries may attempt to export their products through a member country with the lowest tariff.

8. The source of our data set is the UN Trade Statistics, which contains data on trade flows for the Western Hemisphere countries only through 1987. Although this data source is generally considered not as accurate or as up-to-date as U.S. data sources (FATUS), it is the only single source of bilateral trade information.

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