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Estimated Impacts of a Potential U.S.-Mexico Preferential Trading Agreement for the Agricultural Sector

by

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Abstract

We develop a three region - U.S., Mexico, and Rest-of-World - simulation model to analyze the effects on the agricultural sector of a potential preferential trading arrangement (PTA) between Mexico and the United States. The simulation exercises indicate that two-way agricultural trade increases and welfare improves in the United States and Mexico from a bilateral preferential agreement on agricultural products. Our results show that when border protection is eliminated by the United States and Mexico, bilateral agricultural trade expands by over 15 percent. Relative to the size of the two agricultural sectors, however, the overall impact is very small for the U.S. agricultural sector but there is a more significant adjustment for Mexican agriculture.

Keywords: preferential trading arrangements, simulation model, agricultural trade, United States and Mexico.

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Estimated Impacts of a Potential U.S.- Mexico Preferential Trading Arrangement for the Agricultural Sector

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Summary

We develop a simulation model, using a 1988 base period, to show how a preferential trading arrangement (PTA) that removes all bilateral trade distortions would affect the agricultural sectors of the United States and Mexico. Our results show that when border protection is eliminated by the two trading partners, agricultural trade increases $650 million, all other factors held constant (Figure 1). This increase represents over a 15 percent expansion from the $4 billion two-way trade in 1988.

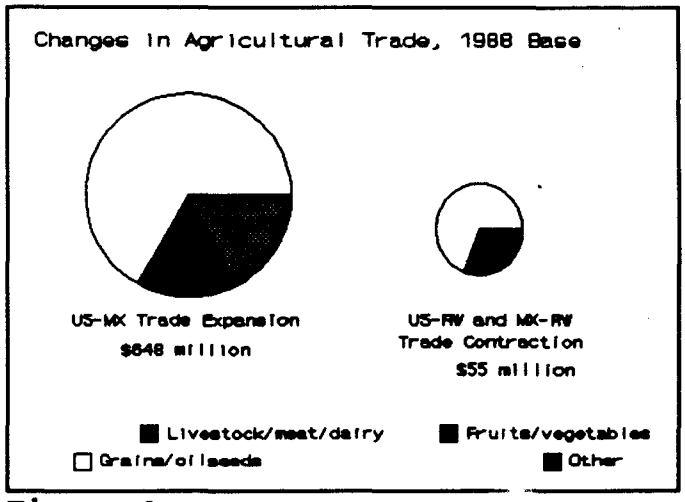

Figure 1

In our model, U.S. agricultural exports to Mexico increase approximately 20 percent, mostly in grains, oilseeds, livestock, and meats. U.S. coarse grain exports to Mexico rise by 60 percent, making Mexico more strongly entrenched as the number three importer of U.S. coarse grains behind Japan and the Soviet Union. Additionally, if Mexico experienced a 10 percent income growth due to the PTA, U.S. agricultural exports to Mexico would rise by an additional 7 percent.

Mexican exports to the United States would also increase. We estimate an agricultural export expansion of 10 percent, mostly in feeder cattle and fruits and vegetables. Feeder cattle exports to the United States increase approximately 20 percent, frozen orange juice concentrate (FCOJ) nearly 50

percent, and fresh tomatoes 10 percent. Even with the increased exports to the United States, the Mexican share of the U.S. fruit and vegetable market remains quite small, approximately 4 percent in FCOJ, for instance.

Our simulation model shows that a U.S.- Mexican PTA causes less than a 1 percent contraction in U.S. and Mexican agricultural imports from other countries. For the United States, there is a small decrease in imports, almost entirely due to FCOJ. Mexican imports from non-U.S. sources, mostly distributed across grains and oilseeds, decline 7 percent. Mexico's southern neighbors, principally Argentina and Brazil, would have small adverse effects from this decline in Mexican imports.

Net producer income is enhanced approximately 1 percent in the United States. Most of the gain occurs in cereals and oilseeds. Savings are also realized on U.S. government agricultural programs--farm subsidies are reduced 3 percent. Hence, farmers, given the opportunity of foreign access, can rely more on markets rather than on government subsidies. There is also a small decline in tariff revenues collected on horticultural commodities and a less than 2 percent decrease in production of the modeled horticultural commodities.

With no border protection, prices of farm products would fall in Mexico. Mexican consumers, including intermediate demanders of feed grains, realize welfare gains equivalent to over 5 percent of the value of Mexican farm production due to lower consumer prices. Feeder cattle producers gain significantly with removal of a high export tax. Mexican fruit and vegetable farmers also experience small gains, approximately 2 percent of farm value. Other Mexican producers, mostly coarse grain farmers, incur income losses with the removal of border protection.

Our results of the trade and welfare effects from a PTA should be interpreted as benchmark estimates. They are dependent on the estimates of price distortions in 1988 caused by border protection. Results of an actual agreement would probably differ from our analysis in coverage and timing. We do not attempt to address what an actual negotiated agreement may look like.

INTRODUCTION

The United States, Canada, and Mexico are negotiating a North American free trade agreement aimed at reducing barriers to trade and increasing investment and growth among the partners. In this paper we assess the trade and welfare effects of a potential preferential trading agreement (PTA) on the agricultural sectors of the United States and Mexico. We focus on the United States and Mexico, for it is in these two countries that the agricultural sectors would be most affected by an agreement.[1] The methodology for our analysis is to use a partial equilibrium 3-region, 29-commodity static model that emphasizes specific agricultural sectors (Table 1).[2] The regions in the model are: the United States, Mexico, and Rest-of-World.

The model is based on national product differentiation. Each country produces a product that can be distinguished from other country producers. For example, U.S., Mexican, and ROW corn are assumed not to be homogeneous but, instead, are imperfect substitutes. In this way, we allow for possible

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[1] Mielke et al. explain that Canada's main interest in the negotiations is to maintain the preferred access obtained in the U.S.- Canada Free Trade Agreement.

[2] The model uses the Static World Policy Simulation (SWOPSIM) framework developed by Roningen and extended by Roningen, Sullivan and Dixit.

expansion of trade between the United States and Mexico and trade contraction between ROW and the United States and between ROW and Mexico.

Table 1--Commodities Used in the U.S.-Mexico Analysis

Grains/oilseeds	Livestock/meats/dairy
Wheat	Live cattle
Corn	Beef
Other coarse grains	Pork
Soybeans	Poultry
Soymeal	Eggs
Soyoil	Butter
Other oilseeds	Cheese
Other meals	Milk powder
Other oils	Fluid milk
Horticultural	**Other**
Melons	Sugar
Frozen orange juice concentrate	Cotton
Cucumbers	Tobacco
Onions	Coffee
Peppers	Dry beans
Tomatoes	

The partial equilibrium model contains commodity supply and demand equations which are parameterized to reproduce 1988 data for the United States, Mexico, and ROW. We call this our BASE solution and we refer to the 1988 data as the base period. After two-way border protection is removed, the model recalculates prices and domestic supply and demand levels, rebalancing trade in the process.[3] The pattern of prices and quantities observed in the base period is then compared with the pattern that emerges from the revised solution. Results indicate what might have happened if a PTA existed in 1988

[3] The removal of Mexican import restrictions, for example, lowers the price of U.S. produced corn that Mexicans consume. The lower price encourages demand for U.S. produced corn and reduces demand for Mexican produced corn depending on the elasticity of substitution.

and if all other exogenous variables pertinent to agricultural markets remained the same.[4]

We analyze a PTA under three alternative sets of conditions. In the first scenario, where we place our major emphasis, we assume that a PTA 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 base model is modified by removing price wedges representing two-way border protection between the United States and Mexico. Results for the individual commodities are presented for this scenario. Additionally, four variants of scenario 1 are analyzed to provide some sensitivity analysis. These variants change the assumptions regarding Mexican domestic policies and consumption behavior on corn and poultry and assumptions regarding income effects on Mexico of a PTA.

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 PTA.

The third scenario combines the first two -- Mexico is assumed to unilaterally remove all border protection with all countries and it also enters into a preferential trade agreement with the United States. This solution is obtained by removing Mexico's border protection for the other two countries and also removing U.S. border protection for Mexican imports.

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[4] Details on the model structure and the database can be found in Liapis, Krissoff, and Neff.

Border protection remains for all exports to ROW and for U.S. and Mexican imports from ROW.

This third scenario, when compared with the first two, indicates (1) the combined impact of a PTA 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 United States sole free access to Mexican agricultural markets (first scenario) and then decide to give all countries equal access (third scenario). A comparison with the second scenario gives an indication of the impact of putting in place a U.S.-Mexico PTA unilaterally liberalizes--an extreme extension of the reduction in trade barriers that is taking place in Mexico.

The results presented here describe the impact of each of the three 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. Thus, we assume that world agricultural markets were 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. Each scenario represents an idealized case. None of the three is claimed to represent a likely outcome of negotiations.

BACKGROUND

In June 1990 Presidents Bush and Salinas agreed to move toward a comprehensive PTA between the United States and Mexico which they stated "can

be a powerful engine for economic development, creating new jobs and opening new markets" (Wagenheim). U.S.- Mexican trade is already substantial and has sharply grown since the 1980s. Mexico purchases about 7 percent of all U.S. merchandised exports, the third most important U.S. customer behind Japan and Canada. The United States consumes approximately two-thirds of all Mexican exports.

The nature of U.S.-Mexican agricultural trade is largely complementary. This can be illustrated by an intra-industry trade index where 0 represents no trade within a sector and 100 percent represents an equal bilateral level of U.S. and Mexican trade. For cereals, meats, and dairy the index equals nearly 0, a considerably smaller number than U.S. bilateral trade with Canada and the European Community where index numbers are in the range of 40 to 50 percent (McDonald and Hart).

The United States' main farm exports to Mexico are feed grains, oilseeds, live animals, meat, and dairy products (Figure 2). Mexico supplies the United States tropical products and specialty crops (Figure 3). Since 1982, Mexico has ranked among the top three suppliers of agricultural commodities to the U.S., principally coffee, fruits and vegetables, and live animals.

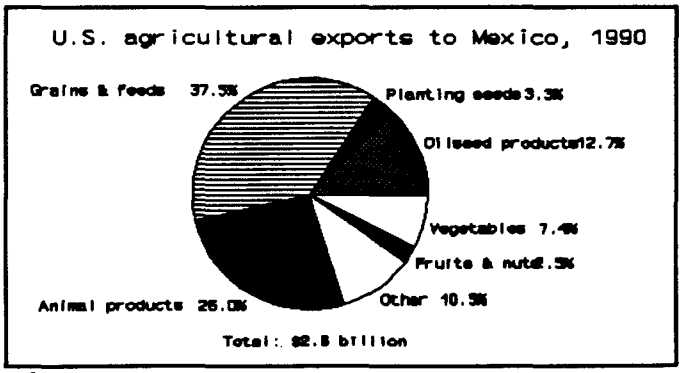

Figure 2

Mexican trade and domestic policies have been undergoing considerable liberalization since 1985 when Mexico indicated an interest in joining the General Agreement on Tariffs and Trade (GATT). Agricultural reform is currently taking place in

compliance with GATT membership even without a free trade agreement. The reforms are aimed at reducing tariff protection, decreasing government intervention in price policies, reducing untargeted producer and consumer subsidies, and reducing the government's role in the production, processing, and distribution of agricultural commodities. Recent reforms include the Mexican government removing licensing requirements for sorghum (1989) and soybeans intended for crushing (1990), allowing some private sources of imports for wheat, and eliminating the price guarantee program and marketing subsidies except in corn and dry beans (1990).

The agricultural and economywide reforms have contributed to the turnaround in the Mexican economy which grew 3.9 percent in 1990 and is expected to reach over 6 percent by the late 1990s. Nevertheless, there have been adjustment costs and political pressures to slow or alter the path of reform. The 1988/89 "agreement" price system for sorghum led to domestic surpluses when millers purchased cheaper imports.[5] In 1990, producers persuaded the government to instate a 10 percent seasonal tariff to assure the domestic crop was purchased first.

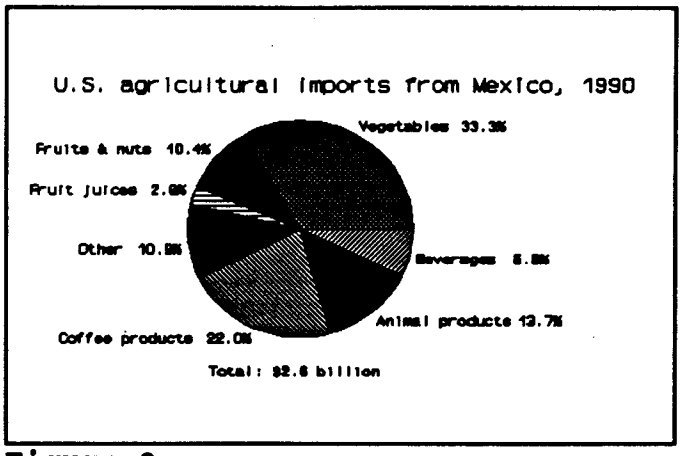

Figure 3

[5] The "agreement" among producers, distributors, processors, and government is aimed at a gradual adjustment to a market price system. The agreement price is negotiated on the basis of the international price and the marketing costs associated with the selling of agricultural products. In addition to sorghum, soybeans, barley, oats, and rice are under the new system.

A PTA with the United States (and Canada) would help encourage the reform process by further enhancing growth and by formalizing the current Mexican liberalization process in an international agreement. The PTA may reduce the possibility of a return to inward oriented policies. In the words of a (U.S.) Presidential transmittal to Congress, it may "...lock in the process of trade liberalization... and ...secure U.S. access to Mexican markets..."

AGRICULTURAL POLICY PROFILES

Domestic and border policies that existed in 1988 are put into the model as price wedges. They represent estimates of price differentials inserted into the marketplace by government policies. Each of the scenario results is obtained by removing selected policies and their associated price wedges from the price equations in the model, 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 groups 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

For policies as they were in 1988, Mexican border price wedges are greater than U.S. wedges except in horticultural products. This suggests that a bilateral liberalization will tend to increase U.S. agricultural exports more than Mexico's.

GRAINS AND OILSEEDS

Border and domestic policy instruments are used in Mexico to influence the markets in wheat, corn, other coarse grains (mainly sorghum), and oilseeds. Through the parastatal CONASUPO, the Mexican government restricts imports by issuing limited import licenses. It provides price supports, input subsidies, and crop insurance in order to assist farmers and establish fixed minimum domestic prices. The level of imports are determined by the gap between expected consumption needs and domestic production. By restricting imports, CONASUPO limits the supply of crops, raises domestic prices above world price levels and thus, encourages domestic production. The 1985-89 average PSEs for corn, sorghum, and soybeans are approximately 55 percent and for wheat 30 percent (Valdes). For each of these commodities, the border component usually comprises at least half of the support level.

On the consumer side, import limitations cause domestic prices to exceed world price levels. To offset the border policies, CONASUPO subsidizes corn, sorghum, wheat, soybeans, and barley sold to agroprocessors. Low income consumers are subsidized through CONASUPO's distribution and retail network. Most corn in Mexico, approximately 85 percent, is used for human consumption while sorghum is primarily used as a feed grain for pork and poultry producers. The average CSE for 1985-89 is about -25 percent on sorghum and soybeans and -15 percent for corn indicating that on net Mexico is taxing its consumers. An exception is dry beans. Imported and domestic dry beans are

sold by CONASUPO at subsidized controlled prices below world price levels with CSEs over 25 percent in the late 1980s. A caveat to the CSE calculation is that the world market for dry beans is very thin and a world reference price is difficult to establish. Hence, the consumer subsidy/producer tax may be measured inaccurately and this market was not liberalized.

In addition to regulating imports, CONASUPO purchases grains from farmers and exporters. When CONASUPO buys from producers, it incurs a loss. It sells to processors at an average market price that is generally lower than the purchase price. When CONASUPO purchases imports from the United States or other exporters, it does so at the world price--a price lower than in domestic markets. The difference between the world price and the domestic market price is a gain -- a "quota rent" earned by CONASUPO. Hence, on net, CONASUPO through its purchases and sales can attain a net loss or gain depending on the difference between the world and domestic prices and the share of imports relative to domestic production.

LIVESTOCK, MEATS, AND DAIRY

Livestock and dairy operations are strongly affected by both input and output policies in Mexico. Land tenure laws limit farm size and severely restrict the growing of feed crops in conjunction with raising beef and dairy cattle, thus increasing operating costs. Most cattle are fed on grass or forage. Mexico also restricts the importation of feed grains, raising input prices and contributing to the high cost of pork and poultry operations. Mexico's pork and poultry production have become more concentrated using confined-feeding production systems despite the high costs of feeds. High costs and low profitability provide little incentive to invest in livestock industries.

To partially mitigate the effects of land restrictions and costly inputs, Mexico protects its livestock, meats, and dairy producers from foreign competition. Import tariffs (and in some cases import restrictions) are placed on cattle, beef, pork, poultry, butter, and cheese. Import tariffs or tariff equivalent estimates equal 10 to 20 percent for these products in 1988. In addition, a $60 per head export tax (about 20 percent of the export price) is placed on cattle to discourage exports and increase domestic beef availability. Nevertheless, the price of beef is usually greater than most Mexican consumers can afford.

Poultry, eggs, and fresh milk (mostly reconstituted from powder) are the principal sources of animal protein. Mexico attempts to maintain egg, poultry meat, and fresh milk prices within the reach of low income consumers by controlling prices and subsidies to consumers. One problem that Mexico faces with its dairy policies is that producers have incentives to divert excessive amounts of fresh milk into dairy products, which do not have price controls.

The trade effects on livestock of eliminating grain, oilseed, livestock, and dairy trade barriers vis-a-vis the United States are unclear a priori. Removing the import restrictions and tariffs on feed grains and meals would reduce operating costs in livestock and dairy operations. The removal of import barriers on livestock and dairy products will increase the competition that Mexican producers will face. Whether the lowering of import costs has a greater production effect relative to the lowering of output prices is ambiguous. The level of government intervention in feeds and in livestock, the share of feed costs to total costs in livestock production, and consumer responsiveness to price changes in domestic and foreign livestock products are

the key variables in determining whether Mexico increases or decreases imports of beef, pork, poultry, and dairy.

HORTICULTURAL COMMODITIES

The horticultural commodities covered in this study have a commonality; import tariffs are placed on these products when entering the U.S. market. The United States imposes a tariff rate either all year round or during certain seasons on each of them.

The average trade-weighted tariff on all Mexican horticultural commodities imported into the United States is about 5 percent, although the range in the ad valorem rates are from 0 to 35 percent (Burfisher and Langley). The most valuable vegetable crops imported from Mexico that now face the highest U.S. tariffs are asparagus, broccoli, and cauliflower. Mexican fresh fruit facing the highest U.S. tariffs are cantaloupes and watermelons. U.S. tariffs on processed horticultural items are relatively high for broccoli, tomato paste, and orange juice. Our analysis includes only the traded horticultural commodities that account for the largest current trade shares, namely--cucumbers, onions, peppers, tomatoes, melons, and frozen orange juice concentrate (FCOJ). FCOJ has the highest U.S. import tariff rate of nearly 30 percent.

For some horticultural products, Mexican exports are complementary to U.S. production. A good example is cantaloupes. About 70 percent of U.S. melon imports come during December to April. During this period, the tariff is zero because the United States is not producing cantaloupes. Mexico's production overlaps U.S. production mainly in May and June. During the 35 percent tariff period from mid-September to December and mid-May through July, only about 20 percent of U.S. melon imports come from Mexico. This smaller

share pulls down the weighted average tariff for Mexican melons to 5 percent. The weighted average tariff for all melons is 10.5 percent.

The U.S. Department of Agriculture regulates some horticultural markets with marketing orders. They are agreements among U.S. producers approved by the U.S. Department of Agriculture to meet specific standards in their production and distribution relating to product quality, size, and maturity. If the grade and size requirements affect foreign producers' exports, then the marketing orders would constitute a trade barrier. For instance, Bredahl, et al. indicate that tomato 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." Other analysis (Jesse, for example) are less conclusive that marketing orders constitute trade barriers. For a recent theoretical study on whether marketing orders constitute nontariff trade barriers, see Chambers and Pick. Because of the controversy relating to whether marketing orders are trade barriers and to measurement difficulties, our analysis does not consider marketing orders as trade barriers. The most important U.S. imports from Mexico that are subject to marketing orders are tomatoes, grapes, and onions.

Until recently, Mexico has maintained policies to limit supply and export of horticultural commodities, most notably tomatoes. The National Federation of Vegetable Producers restricted the number of hectares members could use for planting and had the power to sell certificates of origin required by Mexican authorities for exporting. In June 1991, the Mexican Government decided to provide unlimited free certificates. Because of the difficulty of quantifying these policies, we did not consider them in the simulation exercises. If U.S.

marketing orders and Mexican production and export restrictions effectively limited trade, then our simulation results understate the extent that trade would increase with a PTA.

U.S. - MEXICO PTA: SCENARIO 1

In the first scenario we remove price wedges from the BASE model that represent two-way border protection between the United States and Mexico. Impacts on agriculture are reported in aggregate and for several important commodities.

TRADE IMPACTS

Under 1988 market conditions, model results indicate that a U.S.- Mexican PTA would increase bilateral U.S.-Mexico trade of agricultural commodities by more than 15 percent, approximately $650 million. The value of U.S. agricultural exports to Mexico would increase almost 3 times the increase in Mexican agricultural exports to the United States (Table 2). 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 ROW, due primarily to slightly higher world prices. The price increases are a result of increased imports and increased domestic consumption by Mexico.

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 PTA, the United States accounts for most of Mexico's agricultural trade. Thus there would be little opportunity for diverting Mexico's imports away from ROW and to the United States with a PTA. Also, the

model results show that ROW's aggregate exports to the U.S. remain about the same after the PTA as before.

Table 2--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

WELFARE IMPACTS

Studies have examined the welfare implications of PTAs. 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 aggrement. 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 nor 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 a PTA in place. Model parameters will determine the outcome.

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 PTA. 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 3).[6] The net impact would be a welfare gain for the U.S. from its agricultural sector.

Model results show that with a PTA, the prices of agricultural commodities in Mexico would fall, in aggregate. As a result, Mexican consumers would experience a substantial welfare gain and producers would show a loss.[7]

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[6] 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.

[7] Welfare changes are not reported for the Mexican cattle sector in the aggregated numbers. They are reported in the livestock/meat/dairy sector below. The reason for this omission in the aggregate numbers 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

The Government would experience a net decline in revenue from loss

Table 3--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

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 PTA generates welfare gains to producers and welfare losses to consumers in 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

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.

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 4). With the rise 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 over half of Mexico's expansion of exports to the U.S. There would also be an increase in Mexican exports of feeder cattle.

The PTA 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 production. No horticultural product in the model showed a production decline in excess of 2 percent.

The expansion of 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. But this large percentage change only represents about a 3

Table 4--Changes From BASE in Agricultural Exports by Commodity Group, Scenario 1 (PTA)

Exporter	Importers: U.S.	Mexico	ROW	Total Exports
		--Million dollars--		
United States:				
Grains/oilseeds	-	430	-61	369
Livestock/meats/dairy	-	0	49	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	0	-1	-	-1
Total	3	-39	-	-36

percent increase in total U.S. corn exports and less than a 1 percent increase in production.

GRAINS AND OILSEEDS

When Mexican border protection vis-a-vis the United States is removed, domestic prices in Mexico of U.S. crops decline. Corn and other coarse grains experience price declines of over 30 percent (Table 5). Mexican consumers increase their demand by over 50 percent for U.S. coarse grains as well as oilseeds and products while reducing their demand for Mexican produced crops.

Table 5--Changes From BASE in Agricultural Production, Consumption, and Prices for Select Grains and Oilseeds in Mexico and the United States, Scenario 1 (PTA) 1/

Country/ Commodity	Production	Consumption	Price
		--Percent--	
Mexico			
U.S. corn	-	64.0	-33.2
Mexican corn	-7.3	-7.3	-15.9
U.S. other coarse grain	-	50.1	-32.3
Mexican other coarse grain	-10.9	-13.9	-15.8
United States			
U.S. corn	0.3	-0.8	1.1
U.S. other coarse grain	1.7	-2.1	2.3

1/ As mentioned earlier in the paper, U.S., Mexican, and Rest-of-World corn are assumed not to be homogeneous but, instead, are imperfect substitutes. Thus all three types of corn are available in each country or region, but the United States produces only U.S. corn and Mexico produces only Mexican corn.

The increase in Mexican demand of U.S. produced products has a marginal effect on U.S. prices. For example, corn and other coarse grain producer prices increase by 1 and 2 percent, respectively. The higher prices encourage a slight production response; corn and other coarse grain supply expand 0.3 and 1.7 percent, respectively.

The United States increases its corn and other coarse grain exports $186 and $100 million, respectively, shipping $219 and $123 million more to Mexico

and $33 and $23 million less to ROW (Figure 4). U.S. exports $84 million more of oilseeds and products and $4 million more of wheat to Mexico.

Mexican coarse grain imports from the United States expand by about 60 percent relative to our 1988 base period (Figure 4). This increases the interdependence between the United States and Mexico as Mexican imports from the United States comprise around 40 percent of domestic consumption (Table 6). Historically, coarse grain imports comprise 25 to 30 percent of domestic use, although there has been substantial variation from year to year. The U.S. share of the Mexican oilseed market also expands.

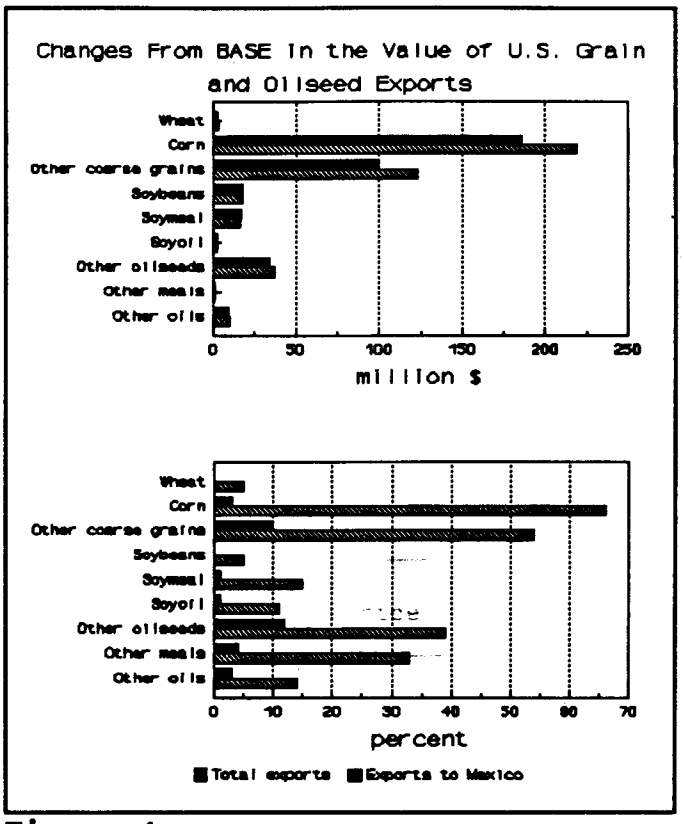

Figure 4

U.S. farmers realize an increase in net income of nearly $340 million or 0.7 percent of farm value, about 60 percent attributed to corn and other coarse grains (Table 7). Additionally, with the increase in market prices, U.S. government deficiency payments to farmers decrease $280 million. Marginally higher commodity prices, though, cost U.S. consumers $140 million for coarse grains and $115 million for oilseeds and products.

In Mexico the removal of import restrictions on grains and oilseeds affects producers, the government treasury, and consumers. Producer and government incomes are reduced by the loss in sales and the exclusivity associated with import licenses. Without the import restrictions, producer

Table 6--The Unites States' Share of Mexican Grains and Oilseed Market, BASE and Scenario 1.

Commodity	BASE	Scenario 1 (PTA)
	--Percent--	
Wheat	9	10
Corn	23	34
Other Coarse Grains	31	44
Soybeans	83	84
Soybean Meal	26	28
Soybean Oils	12	13
Other Oilseeds	12	16
Other Meals	2	3
Other Oils	27	30

income falls over $390 million, $204 million in corn alone (Table 7). Quota rents, mostly associated with CONASUPO, decline $389 million, $324 million in coarse grains (corn and other coarse grains). The government, though, reduces the value of domestic subsidies by $27 million because of lower production levels.[8] Consumers are large beneficiaries of the PTA, experiencing an increase in consumer welfare of $835 million, $381 million in corn and $207 million in other coarse grains. If CONASUPO subsidies to agribusiness and consumers are also eliminated or reduced, then the benefits accruing to consumers would be less than we have indicated and the loss of the quota rents would be offset.

[8] In the simulation analysis we assume that input subsidies to producers on a per unit bases remains constant. This implies that the total value of input subsidies declines when production levels fall.

Table 7--Changes from BASE in Welfare for Grains and Oilseeds, Scenario 1 (PTA)

Commodity	Producer Income	Consumer Benefits	Government Savings	Quota Rent	Net Welfare
			--Million dollars--		
UNITED STATES:					
Wheat	2	-5	29	0	26
Corn	156	-104	188	0	240
Other coarse grains	55	-36	62	0	81
Soybeans	27	-26	0	0	1
Soymeal	19	-15	0	0	3
Soyoil	10	-9	0	0	1
Other oilseeds	62	-59	0	0	3
Other meals	1	-1	0	0	0
Other oils	7	-3	0	0	4
Total	338	-260	279	0	357
MEXICO:					
Wheat	-12	18	1	-5	2
Corn	-204	381	27	-190	14
Other coarse grains	-84	207	19	-135	7
Soybeans	-3	64	-1	-59	2
Soymeal	-27	51	-20	0	4
Soyoil	-13	19	-4	0	2
Other oilseeds	-32	63	-33	0	-2
Other meals	-4	4	0	0	-1
Other oils	-13	27	-14	0	-1
Total	-392	835	-27	-389	28
REST-OF-WORLD:					
Wheat	91	-135	0	0	-43
Corn	153	-234	0	0	-80
Other coarse grains	100	-127	0	0	-28
Soybeans	28	-42	0	0	-15
Soymeal	17	-27	0	0	-10
Soyoil	5	-6	0	0	-2
Other oilseeds	17	-25	0	0	-89
Other meals	6	-6	0	0	0
Other oils	8	-13	0	0	-5
Total	425	-615	0	0	-190

LIVESTOCK AND DAIRY

The removal of Mexican import protection increases the Mexican demand for U.S. livestock and meats and has a marginal effect in increasing livestock and meat prices. This encourages a small U.S. supply response in cattle and poultry. As a consequence, the United States increases its exports to Mexico nearly $18 million in slaughter cattle, a little over $5 million in beef, and about $25 million in pork and poultry (Figure 5). This represents an 8 percent increase in U.S. cattle exports and to 4 percent increase in U.S. pork and poultry exports.

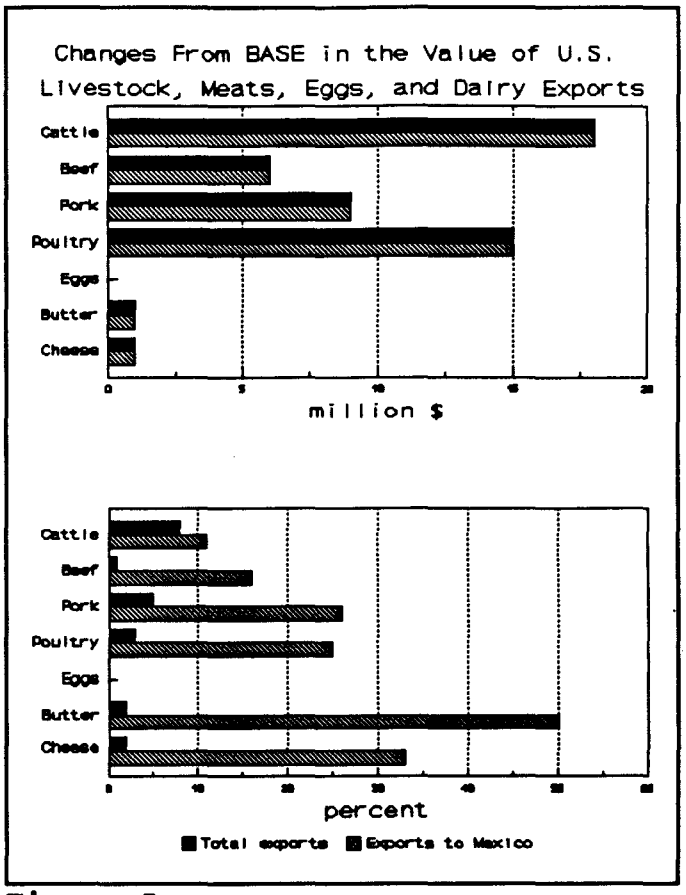

Figure 5

Mexico also increases its feeder cattle exports to 1065 thousand head from the 1988 base of nearly 850 thousand head, approximately a 25 percent increase. This represents a $55 million rise in Mexican exports to the United States, nearly one-third of the increase in all Mexican agricultural exports.

Producer income in the United States for cattle decreases $144 million because of slightly lower feeder prices, less than 1 percent (Table 8). U.S. meat and dairy farmers, though, experience a small increase in net income, $56 million, due to the increase in Mexican demand. With the United States being

a net importer of meats from all sources, the change in net welfare for cattle, meats, and dairy products indicates a small loss of $35 million.

Table 8--Changes from BASE in Welfare for Livestock, Meats, and Dairy, Scenario 1 (PTA)

Commodity	Producer Income	Consumer Benefits	Government Savings	Quota Rent	Net Welfare
			--Million dollars--		
UNITED STATES:					
Cattle	-144	-173	-17	0	11
Beef and veal	13	-23	0	0	-10
Pork	12	-33	0	0	-21
Poultry meat	19	-26	0	0	-8
Eggs	5	-10	0	0	-5
Milk	4	-5	0	0	-1
Butter	1	-1	0	0	-1
Cheese	2	-3	0	0	-1
Milk powder	0	0	0	0	0
Total	-88	72	-17	0	-35
MEXICO:					
Cattle	1532	-1469	-67	0	-4
Beef and veal	-21	24	-3	0	-1
Pork	-12	30	-4	0	14
Poultry meat	-12	47	-10	0	24
Eggs	-6	14	-1	0	7
Milk	0	0	0	0	-1
Butter	-4	4	0	0	0
Cheese	-4	5	-1	0	0
Milk powder	0	0	0	0	0
Total	1472	-1345	-87	0	40
REST-OF-WORLD:					
Cattle	-77	77	0	0	0
Beef and veal	18	-29	0	0	-12
Pork	29	-57	0	0	-28
Poultry meat	9	-22	0	0	-13
Eggs	11	-20	0	0	-9
Milk	19	-29	0	0	-10
Butter	-1	1	0	0	0
Cheese	0	0	0	0	0
Milk powder	0	0	0	0	0
Total	7	-79	0	0	-72

In Mexico producer net income for cattle, meats, and dairy products increases $1.5 billion. The gain is solely attributed to cattle producers, who no longer face an export tax. (See footnote 10 for a caveat.) Meat and dairy producers experience a small income loss despite lower feed costs. The protection afforded Mexico's domestic meat producers from foreign competition exceeds the effects of higher feed costs. This result is highly dependent on the substitutability of U.S. and Mexican meats, especially poultry. See sensitivity analysis. Further, in the long run, investment in the sector may increase, especially if land tenure restrictions are reduced and better feed rations can be adapted; then, producers may experience gains.

On the consumer side, the removal of import protection allows increased availability of meats and dairy products in Mexico, lowering domestic consumer prices of U.S. products in the 5 to 20 percent (Table 9). Meat product consumers gain $124 million in welfare.

Table 9--Changes from BASE in Agricultural Production, Consumption, and Prices for Select Meat and Livestock Commodities, Scenario 1 (PTA)

Country/ Commodity	Production	Consumption	Price
		--Percent--	
Mexico			
U.S. cattle	-	11.2	-7.4
Mexican cattle	0.2	-0.5	15.7
U.S. beef	-	15.0	-5.0
Mexican beef	-.2	-0.2	-0.3
U.S. pork	-	25.3	-8.1
Mexican pork	.5	0.5	-1.1
U.S. poultry meat	-	23.9	-9.1
Mexican poultry meat	2.1	2.1	-3.0
U.S. poultry eggs	-	4.8	-10.0
Mexican poultry eggs	2.5	2.5	-9.3
United States			
Mexican cattle	-	26.0	-9.5
U.S. cattle	0.0	-0.1	-0.2

HORTICULTURAL COMMODITIES

There is an increase in U.S. demand for Mexican melons, FCOJ, cucumbers, onions, green peppers, and tomatoes with the removal of U.S. import tariffs (Table 10). As a result, Mexico expands production in vegetables, approximately 2 to 7 percent and in FCOJ, nearly 19 percent. Its export volume expands in the range of 5 to 15 percent for vegetables and 20 percent for FCOJ, equal to $45 million (Figure 6). Mexican output expands and producer income increases by $32 million or 2 percent of horticultural farm value (Table 11).

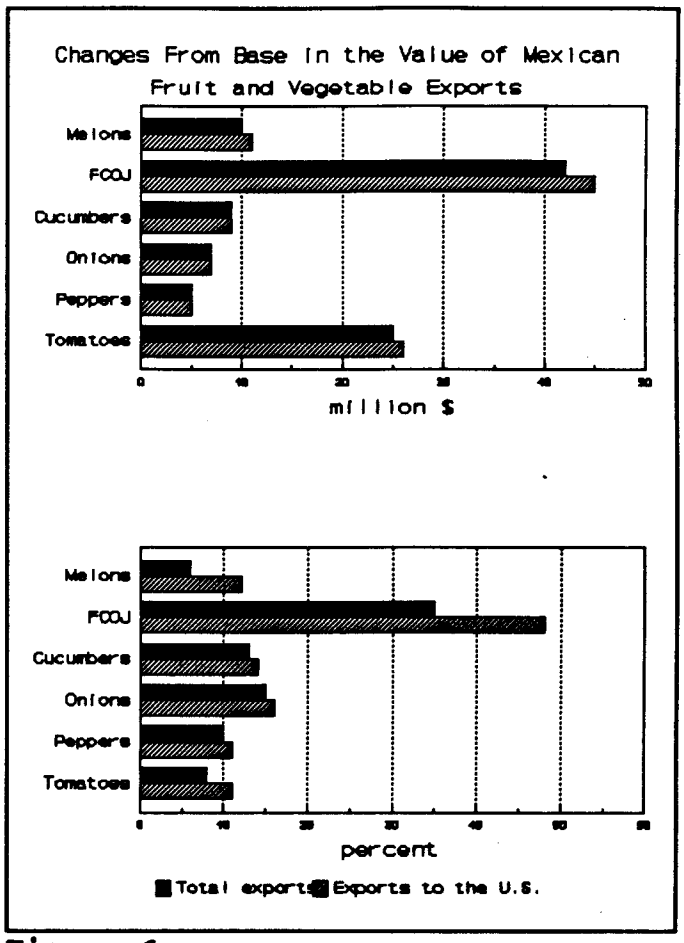

Figure 6

The removal of U.S. tariffs on horticultural products results in price decreases in the U.S. ranging from 0 to 2 percent of U.S. produced products and 4 to 9 percent for Mexican produced products (Table 10). American consumers experience a $72 million gain in benefits due to lower prices and increased purchases. Producers lose $31 million and government tariff revenue decreases $52 million. The loss in producer income represents 1.0 percent of sales. The increased market

Table 10--Production, Consumption, and Price Responses for Horticultural Commodities

Country/ Commodity	Production	Consumption	Price
		--Percent--	
Mexico (Mexican produced)			
Melons	2.4	-0.6	1.3
FCOJ	18.8	-13.4	12.2
Cucumbers	6.6	-1.3	3.6
Onions	3.8	-0.7	2.1
Green peppers	1.6	-0.2	0.9
Tomatoes	1.8	-0.4	1.0
United States (U.S. produced)			
Melons	0.5	-0.6	-0.7
FCOJ	-0.3	-0.4	-0.3
Cucumbers	-2.0	-2.2	-2.4
Onions	-0.8	-10.0	-1.0
Green peppers	-1.5	-1.8	-1.9
Tomatoes	-0.7	-0.9	-1.9
United States (Mexican produced)			
Melons	-	10.8	-4.0
FCOJ	-	32.1	-9.2
Cucumbers	-	10.8	-5.2
Onions	-	13.7	-5.8
Green peppers	-	10.2	-5.1
Tomatoes	-	10.2	-4.1

penetration of the U.S. market by Mexican fruits and vegetables is very small, 1 to 3 percent (Table 12).

SENSITIVITY ANALYSIS

Grain trade, mostly corn, 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 grains and soybeans. First, (scenario 1a) we examine modifications in Mexican domestic policy

Table 11--Changes from BASE in Welfare for Horticultural Products, Scenario 1 (PTA) 1/

Commodity	Producer Income	Consumer Benefits	Government Savings	Quota Rent	Net Welfare
			--Million dollars--		
UNITED STATES:					
Melons	-4	9	-4	0	0
Frozen concentrate orange juice	-6	21	-21	0	-7
Cucumber	-3	7	-5	0	-1
Onions	-6	11	-7	0	-1
Green peppers	-3	7	-4	0	0
Tomatoes	-9	18	-10	0	-2
Total	-31	72	-52	0	-12
MEXICO:					
Melons	3	-1	0	0	2
Frozen concentrate orange juice	12	0	0	0	12
Cucumber	2	-1	0	0	2
Onions	5	-3	0	0	2
Green peppers	3	-2	0	0	1
Tomatoes	7	-5	0	0	2
Total	32	-12	0	0	19
REST-OF-WORLD:					
Melons	-1	0	0	0	-1
Frozen concentrate orange juice	-6	0	0	0	-6
Cucumber	0	0	0	0	0
Onions	-1	1	0	0	0
Green peppers	-1	1	0	0	0
Tomatoes	2	-3	0	0	-1
Total	-6	0	0	0	-7

Table 12--Mexico's Share of U.S. Fruit and Vegetable Market, BASE and Scenario 1

Commodity	BASE	Scenario 1 (PTA)
Melons	12	13
Frozen Orange Juice Concentrate	3	4
Cucumbers	36	39
Onions	7	8
Peppers	22	24
Tomatoes	19	20

toward corn, other coarse grains, and soybeans as part of a PTA. We assume in scenario 1a that Mexican producer (input) subsidies are set equal to U.S. producer (mainly deficiency payment) subsidies on a per unit basis.[9] This implies that Mexican subsidies (per metric ton) are reduced from $35 for corn, $33 for other coarse grains, and $91 for soybeans to $31, $15, and $59, respectively. This represents about a 30 percent reduction of Mexican domestic crop support in addition to the removal of the import tariff equivalents. Results show an 8-percent increase in the growth in U.S. exports of grains and oilseeds compared to scenario 1. (See Table 13 for aggregate trade results.) 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

[9] U.S. support is mainly in the form of deficiency payments while Mexican domestic support is largely input subsidies. The modeling framework treats the effect of these policies equally.

Table 13--Changes from BASE in Agricultural Exports, Sensitivity of Scenario 1

Exporter	Importers: U.S.	Mexico	ROW	Total Exports
	--Million dollars--			
Scenario 1a: PTA and Modification of Mexican Corn Policies				
United States	-	522	-66	456
Mexico	166	-	3	169
Rest-of-World	4	-39	-	-34
Total	170	483	-63	591
Scenario 1b: Scenario 1a and Modification of Mexican Corn Demand				
United States	-	390	-48	341
Mexico	166	-	3	169
Rest-of-World	2	-39	-	-37
Total	168	351	-45	473
Scenario 1c: PTA and Modification of Mexican Poultry Demand				
United States	-	472	-59	413
Mexico	165	-	5	170
Rest-of-World	3	-39	-	-36
Total	168	433	-54	619
Scenario 1d: PTA Assuming 10 Percent Mexican Income Growth				
United States	-	630	-67	563
Mexico	73	-	-13	60
Rest-of-World	31	-19	-	11
Total	104	611	-80	634

in demand for U.S. corn by Mexicans, due to a PTA, 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 PTA, by over 20 percent

relative to results in scenario 1. U.S. welfare estimates (shown in table 4 for scenario 1) are reduced by almost 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 a PTA 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 behavior in Mexico.

Our next change in assumptions relates to the poultry sector. The removal of import barriers on feed grains reduces the production costs for poultry and generates a supply response. The rise in poultry production reduces the domestic price of poultry and consumption expands. Because the Mexican poultry inspection system fails to meet U.S. requirements, there is virtually no foreign demand for Mexican poultry. With no outlet for the increased poultry production, the domestic price falls until domestic supply equals domestic demand.

The rise in Mexican poultry production would not reduce domestic prices (small country case) if the Mexican market is fully integrated with the world market and if poultry is a homogeneous product in international markets. Instead, there would be a quantity adjustment; Mexico would substitute towards domestic producers and away from U.S. and foreign imports.

Scenario 1 assumes a limited substitutability between Mexican and U.S. poultry (elasticity of substitution equals 3). If Mexicans perceive U.S. and Mexican poultry to be more similar, then there would be a greater substitution

away from U.S. imports towards domestic poultry. In scenario 1c we adjust the parameters to allow for a greater substitution.[10]

To see the difference in effects from the change in assumptions, we first remove only feed grain trade policies. The removal of feed grain import barriers reduces Mexican poultry imports from 54 to 44 thousand metric tons compared to 51 thousand metric tons when there is less substitution. With both livestock and feed grain restrictions eliminated, Mexican imports of U.S. poultry essentially do not change. (Compared to scenario 1, poultry imports increased to 67 thousand metric tons (Table 14). Thus, the change in poultry trade is very dependent on Mexican consumers' perception of the substitutability between U.S. and Mexican poultry and homogeneity of the poultry sector.

One further experiment (scenario 1d) is conducted to provide sensitivity analysis on changes in income resulting from a PTA. 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 foods.

In our partial equilibrium analysis economic growth is not endogenously modeled. However, an exogenous estimate of changes in income can be included in the commodity demand equations. Some of the general equilibrium analyses indicate that Mexican and U.S. income growth resulting from a PTA would be

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[10] Specifically, we increased (in Mexico) the cross price elasticity of demand for U.S. poultry with respect to the price of Mexican poultry and the own price elasticity of demand for Mexican poultry. The two parameter changes proximate a greater substitutability of U.S. and Mexican poultry and a more homogeneous Mexican poultry sector relative to other international producers.

Table 14--Mexican Poultry Production, Imports, and Consumption Under Alternative Assumptions, Scenario 1

	Domestic Production	Imports from United States	Consumption
		--1,000 metric tons--	
1988 BASE	689	54	734
Remove all trade barriers			
low cross price elasticity	704	67	771
high cross price elasticity	719	54	773

less than 1 percent. Kehoe suggests that the 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.

Scenario 1 implicitly assumes that there are no changes in income for the U.S. or Mexico. In scenario 1d we assume that Mexican income increases 10 percent and there is no income change in the U.S. Scenario 1d roughly parallels Kehoe's hypothesis over an intermediate run. All other policy assumptions in scenario 1d correspond to scenario 1.

Our results indicate that there are moderate trade effects associated with scenario 1d. With income increasing in Mexico there is an expansion in demand for both domestic and foreign products. Mexico has less available for foreign sale and hence, exports 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 increase (90 percent) is in meats.

UNILATERAL TRADE LIBERALIZATION IN MEXICO: SCENARIO 2

In scenario 2 all Mexican trade barriers are eliminated. This scenario represents the extreme position of current Mexican policies of liberalizing the economy.

Scenario 2 leads to an expansion of Mexican imports of agricultural commodities of the same magnitude as with a PTA--with the U.S. capturing most of that increase (Table 2). 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 3). 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 benefit from no increase in prices of those commodities that Mexico would export with a PTA.

U.S.- MEXICO PTA AND A MEXICAN TRADE LIBERALIZATION: SCENARIO 3

In scenario 3 all Mexican trade barriers are eliminated plus the United States and Mexico agree on a PTA. Effectively, this scenario indicates the impact of a lower bound impact of a PTA--one in which Mexico completely liberalized and then signed a PTA--rather than an upper bound scenario where Mexico and the United States agreed to a PTA given 1988 conditions.

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--a PTA only (Table 2).

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

A comparison of scenario 3 with scenario 1 indicates that a U.S.-Mexico PTA has a relatively large impact on U.S.-Mexican agricultural trade. However, the additional impact that could be obtained from Mexico removing its agricultural trade barriers with all other countries is quite small. 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 PTA after Mexico would unilaterally remove border protection with all countries. The additional impact of the PTA is to remove U.S. border protection and enable Mexican exports to the U.S. to expand. As expected, 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.

A comparison of scenario 3 with scenario 2 suggests that there would be a small but positive net welfare gain for the U.S. from a PTA with Mexico if Mexico were to first liberalize its own economy.

CONCLUSIONS

The total removal of border protection (scenario 1) provides an upper bound on the intermediate-run impact of a PTA on U.S. and Mexican agriculture and agricultural trade. Model results indicate that the United States and Mexico increase agricultural trade and there is an improvement in welfare for both countries. However, the implied adjustments to the agricultural sectors result in quite different affected parties.

Bilateral agricultural trade is estimated to increase by 15 percent, a 20 percent increase in U.S. exports to Mexico and a 10 percent increase in Mexican exports to the United States. 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.

In the United States there are income gains to producers of grains and meat products, and exports of these commodities expand. Producers of horticultural products incur small income losses, as Mexican fruits and vegetables become more competitive with U.S. produced commodities. Our results indicate that there is less than a 2 percent decrease in U.S. production of any of the fruits and vegetables. This is less than typical year-to-year fluctuations in U.S. production.

Our analysis suggests that Mexican consumers and agroprocessors attain significant gains from a PTA. Consumers benefit mostly in grains, oilseeds, and meat products. Mexican farmers who produce these commodities, though, experience income losses. For those on small crop farms, a substantial labor adjustment may be necessary. The expansion in the horticultural sector could absorb some additional labor resources.

Unilateral Mexican trade liberalization generates about the same overall magnitude of impact on U.S. and Mexican agriculture as the PTA. Mexico agriculture garnishes additional gains, mostly in horticulture, when the United States also allows free access. If Mexico were to continue to liberalize its trade prior to putting a PTA in place, then the additional economic impact of the PTA would be reduced.

The size of the overall economic impact of the PTA 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 exports, and on adjustments that would need to be made by Mexican farmers.

Similar to most quantitative analysis, our estimates are based on a model which is a simple representation of the real world. As such, there are several considerations not included in the analysis. First, our results are based on a complete agricultural liberalization of two-way border policies by the United States and Mexico and may not reflect the extent nor the timing of a potential agreement. Second, our results are based on a liberalization from the year 1988 rather than the date an agreement may actually take place. Third, our analysis does not include Canada, which would be included in a North American Free Trade Agreement. Fourth, our analysis does not consider reforms in safety and health regulations, changes in the macroeconomic environment, or liberalization in other traded sectors. The effect of a PTA on Mexican income growth, and ultimately on growth in demand, is not endogenously measured. This factor could be a key variable in determining the effects of a PTA. Increased income growth in Mexico due to a PTA would expand U.S. agricultural exports to Mexico. Fifth, and probably even more important, this research says nothing about the political impact of a PTA. A PTA might foster a more stable economic environment in Mexico which could provide long run benefits outstripping those benefits estimated in this study. The net impact of these five factors could be larger than measured here.

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