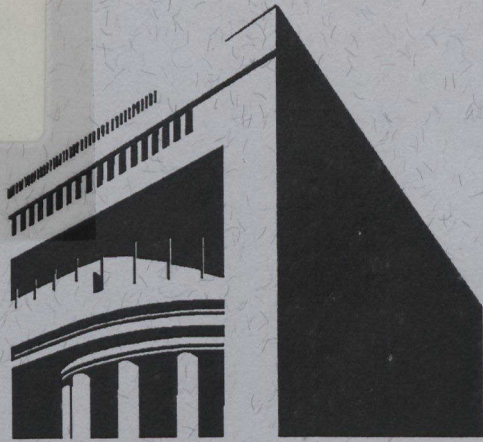


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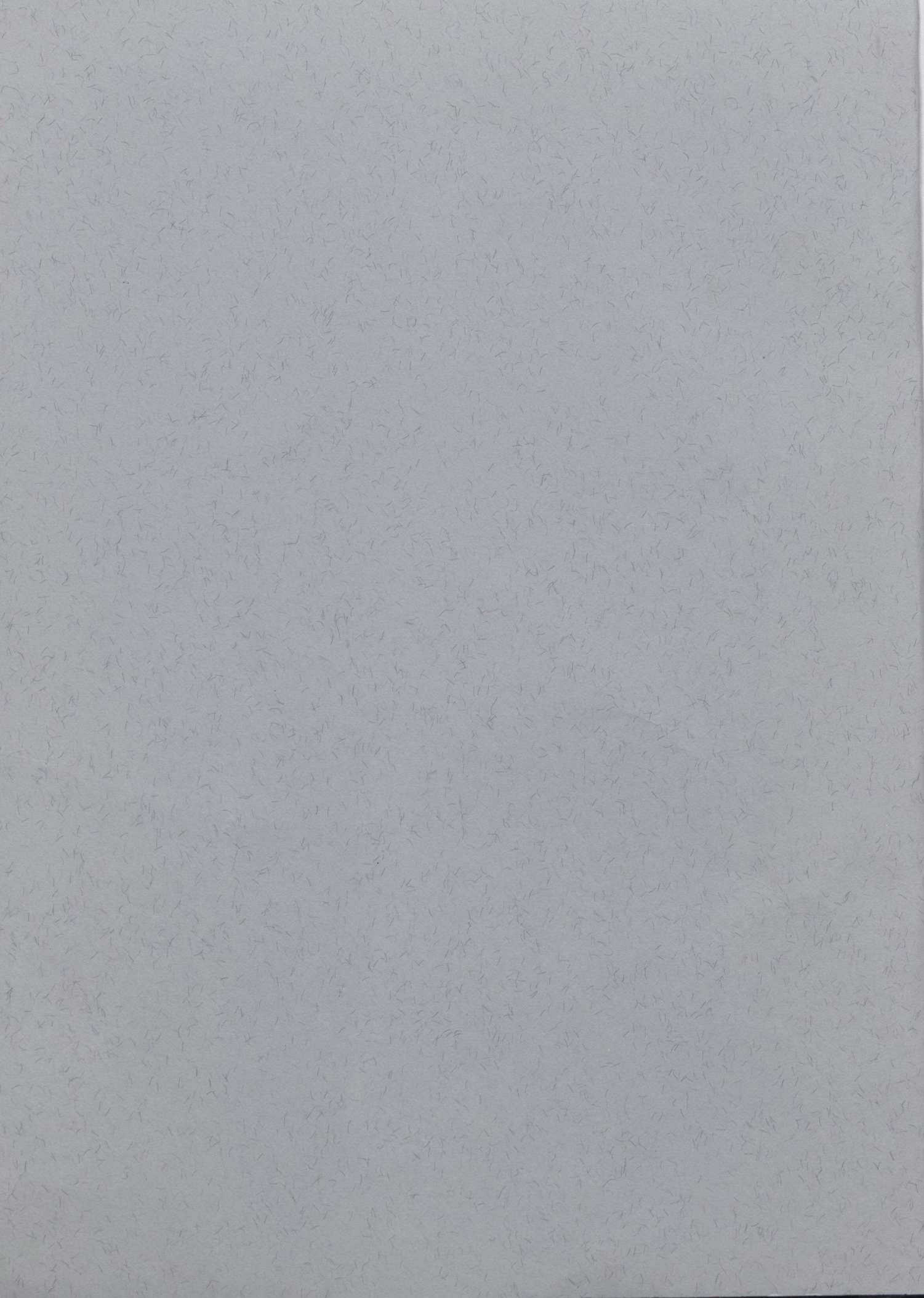


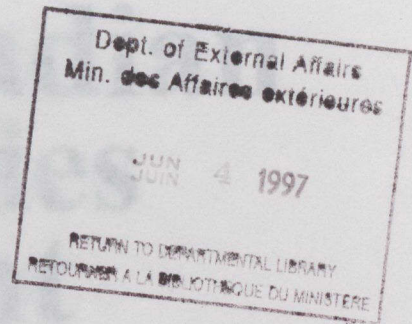
Canadian Studies Grant Programs

Impact of CFTA/NAFTA on U.S. and Canadian
Agriculture

Luther Tweeten, Jerry Sharples and Linda
Evers-Smith
Ohio State University, Columbus

Canadian Embassy/Ambassade du Canada
Washington, D.C.
1997





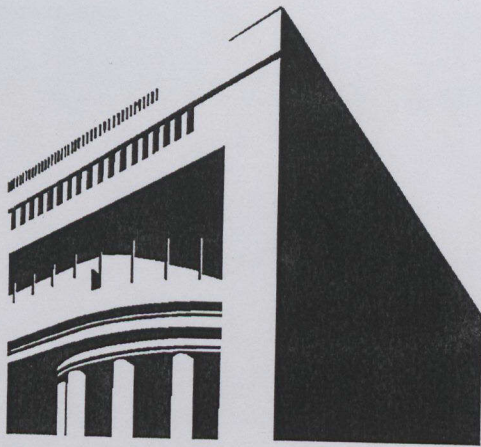
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IMPACT OF CFTA/NAFTA ON U.S. AND CANADIAN AGRICULTURE¹

by

Laura Dierkes, Jerry Sharples, and Linda Evers-Smith

The Canada-US bilateral component of NAFTA began on January 1, 1989 when the Canadian-US Free Trade Agreement (CFTA) went into effect. We now have over 7 years of experience

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Trade of goods and services between the United States and Canada is important for the United States and vitally important for Canada. The same is true for agricultural trade. About 50 percent of Canada's agricultural exports go to the U.S. and 35 percent of Canada's agricultural imports come from the U.S. For the United States, 11 percent of agricultural exports go to Canada and 19 percent of imports come from Canada (4). U.S. agricultural exports to Canada totaled \$5.5 billion in fiscal 1996, second only to Japan.

¹Respectively, Anderson Professor, Senior Researcher, and former Research Associate, Department of Agricultural Economics, The Ohio State University, Columbus. Presented at the International Agricultural Trade Research Consortium, Washington, DC, December 15-17, 1996.

²Number in parentheses refers to an item in the list of references.

IMPACT OF CFTA/NAFTA ON U.S. AND CANADIAN AGRICULTURE¹

by

Luther Tweeten, Jerry Sharples, and Linda Evers-Smith

The Canada-US bilateral component of NAFTA began on January 1, 1989 when the Canadian-US Free Trade Agreement (CFTA) went into effect. We now have over 7 years of experience with that component of NAFTA--enough years to draw some preliminary conclusions about its impact.

This paper has two principal objectives:

- To measure the contributions of CFTA/NAFTA to the agricultural trade of Canada and the United States, and
- To quantify the level and distribution of benefits and costs of further liberalization of agricultural trade between the two countries.

Before addressing these objectives, we examine how agricultural trade of the two countries has fared since 1989.

THE SETTING

Trade of goods and services between the United States and Canada is important for the United States and vitally important for Canada. The same is true for agricultural trade. About 50 percent of Canada's agricultural exports go to the U.S. and 35 percent of Canada's agricultural imports come from the U.S. For the United States, 11 percent of agricultural exports go to Canada and 19 percent of imports come from Canada (4)². U.S. agricultural exports to Canada totaled \$5.8 billion in fiscal 1996, second only to Japan.

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In the late 1980s, political leaders in both countries believed that a bilateral trade agreement was in their own best interests.³ The turbulent conditions in global agricultural markets and the new GATT negotiations provided additional incentives for improving the environment for trade between the two countries. Compared to agricultural tariffs in other countries, the tariffs of Canada and the United States were not high: U.S. rates averaged 3.3 percent, Canada's 9.9 percent. However, nontariff barriers to trade by both countries, such as quotas and licenses, tended to be more restrictive.

Both countries saw agricultural export potential across the border. But Canada was frustrated by U.S. dumping and countervailing duty laws, as well as non-tariff barriers. Canada was looking for more secure access to U.S. markets based upon clear rules supported by a binding dispute-resolution procedure. The United States wanted improved access to the Canadian market and the elimination of freight rate subsidies to prairie grain.

CFTA/NAFTA: The Agricultural Component

In the final agreement, both countries agreed to reduce agricultural trade barriers and to follow a specified procedure for resolving disputes. For agriculture, however, the CFTA was not in fact a "free trade" agreement. The most sheltered domestic industries in both countries continued to be protected from import competition.

The agricultural provisions of the CFTA are listed in table 1. Key provisions are:⁴

- Eliminate nearly all tariffs within 10 years (by 1/1/1998)
- Temporary tariff protection for fresh fruits and vegetables for up to 20 years
- U.S. liberalize import of certain Canadian products containing sugar
- Canada eliminate import licenses for U.S. grain and their products when the level of support provided by U.S. programs declined to the level in Canada. But either country could impose import restrictions if grain imports increased due to changes in grain policies in the exporting country.
- Each country exempt from the meat import restrictions of the other.
- Neither country to apply direct subsidies to exports to the other.

³For more on the background to the CFTA, see (10).

⁴These are abstracted from (10, pages 42-43).

- Procedures specified for settling disputes and reviewing trade barriers.

When NAFTA became law on January 1, 1994 it incorporated all the agricultural components of the CFTA. The agreement allowed the two countries to more fully reveal their respective comparative advantage.

Revealed Comparative Advantage

Data on trade of agricultural products in 1995 reveal where comparative advantage lies at the 1995 stage of liberalization of Canadian and U.S. agricultural markets (table 2). The United States has a comparative advantage primarily in fruits and vegetables and their products. U.S. exports to Canada of products in this category exceed by four times its imports from Canada. Canada has a strong comparative advantage in trade of live animals. The value of Canadian exports to the United States of live animals exceeds U.S. exports to Canada by a factor of ten.

Perhaps the most revealing information in table 2 is the similarity of agricultural trade in both directions. The distribution of trade among the various categories is approximately the same for U.S. agricultural products going north as for Canadian products going south. This is additional evidence of the similarity of agricultural supply and demand on both sides of the border.

However, many significant one-way trade flows of very specific products are hidden within product categories. For example, some meat products exported by the United States are quite different from those exported by Canada. Within the "oilseeds and products" category, soybeans go north and canola goes south.

Canadian and U.S. agricultural markets have much in common. Technology and the costs of labor and capital are similar in the two countries. The feed and livestock sectors are very important to both. The marketing infrastructure is comparable. Consumers in both countries have similar incomes and food preferences. As a consequence, Canadian and U.S. farmers have the potential to produce similar products at roughly the same cost. And Canadian consumers have similar food purchasing patterns.

But the two agricultural sectors have a political history of going their own way. Each country protected and subsidized major parts of its own agricultural industries. Barriers to agricultural trade were erected. Exports were subsidized. Protection and subsidies reached new heights in the mid-1980s. As a result, agricultural products primarily moved east-west. Cross-border trade was more difficult and costly than within-country shipments because of (a) transportation systems that were built only to serve within-country needs, (b) barriers at the US-Canadian border, and (c) a Canadian subsidy on east-west movement of grain. Even under these conditions, however, there was substantial agricultural trade between the United States and Canada prior to the CFTA.

Major changes are taking place in agricultural policy and politics in the two countries. The CFTA/NAFTA, one component of that change, is reducing the barriers to moving agricultural products north and south across the border. The subsidy on transportation of Canadian prairie grains and other crops under the Western Grain Transportation Act was eliminated on August 1, 1995. In addition, both countries are unilaterally reducing constraints and subsidies to agricultural production. As trade barriers come down, farms, firms, and industries on both sides of the U.S.-Canadian border are being forced to adjust to new opportunities and new competition. Canadian agriculture, due to its smaller size and higher protection, is facing larger adjustments.

This process of liberalization and integration being observed between the United States and Canada has been going on within the European Union for some time. The trade data discussed above suggest that this process of integration also is taking place between the U.S. and Canadian agricultural sectors, encouraging trade.

IMPACT OF THE CFTA/NAFTA

More Trade

In response to changes in policies and economic conditions, agricultural trade between Canada and the United States is rapidly increasing. Between 1989 and 1995, two-way U.S.-Canadian agricultural trade increased 120 percent, whereas over the previous 6 years, it increased only 39 percent. By comparison, combined U.S. agricultural imports and exports to all countries increased only 39 percent between 1989 and 1995, and 12 percent the previous 6 years (USDA data).

Figures 1-9 show U.S.-Canadian agricultural trade from a U.S. perspective⁵. They show how bilateral trade has progressed during seven years since the beginning of the CFTA (i.e., to the right of the vertical bar in each figure) relative to the seven previous years. They show:

- During the CFTA years the share of the United States agricultural exports going to Canada has sharply increased. During the first five years of the CFTA, the Canadian market was about the only source of growth of U.S. exports. Prior to the CFTA, the Canadian share of a volatile U.S. export market was surprisingly stable (figures 1 and 2).

⁵The data source for these figures is (3). The Annex compares trade statistics from U.S. and Canadian sources.

- The Canadian share of U.S. agricultural imports started increasing 2 years prior to the CFTA, and has since continued to increase. The dip in 1995 was due to an unusually large increase in the value of U.S. exports to other countries (figures 3 and 4).
- The main source of growth in U.S. exports to Canada during the CFTA has been vegetables and vegetable products. Notable increases also occurred with fruits and their products, "other meat" (excludes poultry), and poultry (figures 5 and 6).
- Expansion of U.S. imports of grains, feeds, and related products accounts for much of the growth in total imports from Canada since the CFTA began. Expansion also occurred--before and after the CFTA--in meat products, oilseeds and products, and "fruits, nuts, vegetables, and their products" (figures 7 and 8).
- Averaged over the 14 years of data shown in figure 9, the value of U.S. agricultural imports from Canada has about equaled the value of exports to Canada.

Did the CFTA/NAFTA Cause the Increased Trade?

A number of factors other than the CFTA/NAFTA could have influenced bilateral agricultural trade since 1988. de Janvry (2), examining the impact of NAFTA on US-Mexico trade, used econometric analysis to separate effects of the agreement from effects of changes in per capita income, exchange rates, and a time trend. He found that over NAFTA's short life to mid-1996, the agreement increased U.S. exports to Mexico over what they would have been without NAFTA. However, NAFTA did not significantly increase Mexican exports to the United States.

The exchange rate also is likely to influence U.S.-Canadian trade. At the beginning of the agreement period the Canadian dollar was strong relative to the U.S. dollar. In recent years it has weakened. The drop in the value of the Canadian dollar would be expected to make Canadian goods more competitive in U.S. markets and make U.S. goods less competitive in Canadian markets.

We attempted to separate the impacts of the agreement on bilateral agricultural trade from (a) changes in the exchange rate, and (b) other forces--including growth in per capita income--associated with general growth in economic activity in both countries. We examined separately U.S. agricultural exports to Canada, and Canadian exports to the United States over the 27-year period 1969-1995--20 years prior to the agreement and seven years under the agreement. For this simple econometric analysis we assumed that three variables would capture most of the forces shaping bilateral trade since 1969: the CFTA/NAFTA, the real exchange rate, and a linear trend. The details are in tables 3 and 4.

This simple model accounts for most of the variation in bilateral agricultural trade, with the exchange rate and the agreement playing important roles. The real exchange rate is significantly associated with U.S. year-to-year movements in exports to Canada since 1969 based on Canadian

data (table 4), but it is not a significant factor elsewhere. Results indicate a 1 percent decrease in the Canadian/U.S. real exchange rate increases American agricultural exports to Canada (post-agreement) by about 0.4 percent.

U.S. and Canadian data on agricultural imports and exports differ for reasons beyond what can be accounted for by product coverage and transshipments. (See table 9 and Annex Figure 1 for differences in data compiled by the two countries.) Because of the need to collect duties, enforce quotas, and in general keep domestic producers informed of their competition, imports are probably measured more accurately than exports. That was one reason why U.S. agricultural export data were aligned with Canadian agricultural import data in 1990. Unfortunately, that adjustment was confounded with the advent of the CFTA, biasing upward the regression coefficient for the CFTA/NAFTA impact on U.S. agricultural exports to Canada shown in table 3.

Table 4 contains the same regression equation specification as Table 3 but using Canadian data on agricultural trade. The result is significant positive coefficients for CFTA/NAFTA as in Table 3, but the agreement is estimated to increase U.S. agricultural exports to Canada by \$481 million (versus \$2,379 million based on U.S. data) and to boost Canadian agricultural exports to the U.S. by \$2,203 million (versus \$1,566 million based on U.S. data). If we arbitrarily average the two estimates to form the "best" estimate, then CFTA/NAFTA is estimated annually to add \$1,430 million of U.S. agricultural exports to Canada and \$1,884 million of Canadian agricultural exports to the United States. Thus CFTA/NAFTA contributed an estimated 25 percent of the \$5.8 billion of U.S. agricultural exports to Canada in 1995.

The significant positive coefficients of the linear trend variable suggest that other forces were associated with steady growth in bilateral trade throughout the 27-year period. The estimated coefficients for this variable indicate that, once the effects of exchange rates and the CFTA/NAFTA are removed, Canadian exports to the U.S. grew each year at about the same rate as U.S. exports to Canada.

Our finding that the CFTA/NAFTA had a significant impact on agricultural exports is quite sensitive to specification of the model. More sophisticated analysis is called for to estimate the unique impacts of exchange rates and the agreement on bilateral agricultural trade.

More Trade of Manufactured Food Products

The CFTA/NAFTA appears to have encouraged a large expansion of bilateral trade in manufactured food products (excludes bulk commodities and raw materials). Prior to the CFTA, bilateral trade was limited by high tariffs and uncertainty. After CFTA, Canadian exports of manufactured food products to the United States were up 125 percent between years 1989 and 1994 alone. Exports to other destinations were up only 24 percent. On the other hand, Canadian imports from the United States were up 58 percent; from other countries up 37 percent (14, page 10).

The Canadian manufactured food sector is making structural changes as a result of CFTA/NAFTA. Before CFTA, this sector mainly consisted of small scale plants producing for the domestic market. CFTA/NAFTA is providing more export opportunities and import competition. Some firms are now producing specialized and brand-name products for the U.S. market in larger, more efficient plants. Competition is forcing other plants to shut down. The net result is a more efficient sector finding that it can compete in the U.S. market (6, 14).

THE UNFINISHED AGENDA

The term "free trade" in CFTA/NAFTA has no timetable for realization in U.S.-Canadian agricultural trade. Substantial protection remains in U.S. and Canadian agriculture. Canada's dairy and poultry industries, and U.S. sugar, tobacco, and peanut industries remain highly protected. As the other parts of agriculture in the two countries become less dependent on protection, pressures will likely grow for reform of these remaining industries. Estimates of potential welfare gains and losses from additional reform are included in the following pages, drawing from existing studies where possible (see methodology in Annex B).

Economists recognize that costs associated with removing protection are immediate and apparent to losers, while benefits are longer run and not necessarily apparent to beneficiaries. As liberalization progresses, the economic costs are expected to decline relative to the benefits. As the years bring fewer losers and more gainers, the political base is expected to grow for more liberalization and for more of the associated economic integration with trading partners.

Dairy

We estimated the welfare implications of free trade in the dairy industry using parameters from a study by Hallberg and Baker (7). Based upon their results from a static equilibrium model of the U.S. and Canadian dairy industries in 1990, we calculated the following welfare gains from dairy trade liberalization:

	Annual benefit in:	
	United States	Canada
	(million dollars)	
Consumer welfare	-437	720
<u>Producer welfare</u>	<u>442</u>	<u>-636^a</u>
National welfare	5	84

^aIncludes loss of quota rent.

With free trade, the United States increases exports of dairy products to Canada. The increased exports bring a small increase in milk prices in the U.S. and a large decline in milk prices in Canada, causing a downsizing of the Canadian dairy industry. The major beneficiaries of free trade are Canadian consumers and U.S. producers. The net welfare gain to both countries is positive, and totals a present value of nearly \$2 billion if discounted at 5% is perpetuity.

Eggs

The North American egg industry is much smaller than the dairy industry but distortions to trade are also quite large. We estimated the welfare impacts of free trade in eggs and egg products based on a study by Kim, Schrader, and Dimaranan (9). They used a static equilibrium simulation model to represent the egg industry in North America in 1988.

Estimated welfare gains from egg trade liberalization are:

	Annual benefits in:	
	United States	Canada
	(million dollars)	
Consumer welfare	-52	174
Producer welfare	53	-141
<u>Quota rents^a</u>	<u>0</u>	<u>-14</u>
National welfare	1	19

^aCanada is assumed to lose the rents associated with the import quotas.

As with the dairy example, the increase in exports to Canada has a very small upward impact on prices in the U.S. but a large drop in Canada. Because of the relatively small size of the industry, net welfare gains are small, but a significant redistribution of welfare from Canadian producers to Canadian consumers is implied.

Sugar

Estimated welfare gains from sugar trade liberalization are (see Annex B, scenario 4 for methodology, note conversion of Canadian to U.S. dollars at U.S. \$1 = C \$1.15):

	Annual benefits in:	
	United States ^a	Canada ^b
	(million dollars)	
Consumer welfare	1,450	-77
Producer welfare	-1,200	10
National welfare	250	-67

^aMidpoint estimates for 1985 from Council of Economic Advisors (1, p. 159) assuming world sugar prices increase 50 percent with liberalization.

^bAssumes supply elasticity of .3 and demand elasticity of -.24 for Canada under 1990 conditions (Annex B).

Poultry and dairy are highly protected in Canada, and major welfare gain accrue to that country from liberalization. In contrast sugar is heavily protected in the U.S. and major gains accrue to the U.S. and losses to Canada from liberalization. With complete liberalization by the U.S. and Canada, world price rises to 17 cents per pound. Raising the world sugar price costs Canadian consumers \$77 million. Canadian producers gain \$10 million, but their production is too small to avoid a large loss of \$67 million to the Canadian public at large.

Benefits of peanut liberalization of the protected U.S. market are much smaller, because peanuts are a small proportion of U.S. farm output and utilize a two-price system largely transferring income from U.S. consumers to U.S. producers. Benefits of tobacco liberalization also are small because savings in production costs could be offset by social costs of higher tobacco consumption with a lower price.

Durum Wheat and Pasta

A number of studies summarized by Linda Evers-Smith examined the price impacts of distortion in markets introduced by restrictions on Canadian durum wheat exports to the United States. We analyzed welfare impacts under a wide range of price elasticity and other assumptions, but never found a welfare (deadweight) loss in excess of \$1 million. Transfers of income between producers and consumers were also modest in relation to those for other commodities. Our conclusion is that removal of trade distortions in poultry, dairy, and sugar are of higher priority than durum wheat (or peanut and tobacco) liberalization.

CONCLUSIONS AND SELECTED IMPLICATIONS

Summing results from previous tables, we estimate that in aggregate the CFTA/NAFTA trade reform has added an estimated \$1.4 billion to U.S. agricultural exports to Canada and \$1.9 billion to Canadian agricultural exports to the United States. Thus exports have expanded markedly in both countries as a result of the agreement. Given possible errors in the data, it is not possible to say that the U.S. has gained more exports than Canada from the arrangement.

Welfare impacts of more complete liberalization of U.S.-Canadian agricultural trade are summarized as follows:

	Annual benefits in:	
	United States ^a	Canada
	(million dollars)	
Consumer welfare	961	817
<u>Producer welfare</u>	<u>-705</u>	<u>-767</u>
National welfare	256	36 ^a

^aSubtracts \$14 million of quota rents.

Consumers benefit from liberalization of nearly \$1 billion per year in each country, implying *relatively* greater benefit to Canadian than to U.S. consumers. It is notable that losses to Canadian producers are absolutely and relatively greater than to U.S. producers. Overall deadweight gains are positive to each country and are more in line with the size of the agricultural sectors than are redistributions among producers and consumers. The annual combined two-country addition to national income (\$256 + \$36 million = \$292 million) may not seem large but totals a present value of \$5.8 billion when discounted in perpetuity at a 5 percent discount rate.

The above results are primarily determined by the relative sizes of the industries in the two countries and the absolute and relative size of the trade barrier on both sides of the border. The static nature of the analysis may underestimate some benefits and overestimate some costs of protection. The cumulative dynamics of improved efficiency forced upon producers by trade liberalization would change these estimates of welfare costs after more years of adjustment. Improvement in the efficiency of transportation, processing, wholesaling, and retailing as a result of free trade could reduce costs in the longer run.

Finally, we address implications for adjustment assistance, dispute settlement, north-south trade rerouting, narrowing domestic policy options, and pressure for monetary union between the U.S. and Canada.

Adjustment Assistance

The above results indicate that transition to free trade in the highly protected sectors implies large losses by Canadian poultry and dairy producers and by U.S. sugar producers. An adjustment assistance policy could be part of a liberalization package.

Dispute Settlement

A key to the success of NAFTA will be the extent to which the dispute settlement process does in fact resolve disputes in a timely manner. Will the disputing parties allow the process to dictate modifications of domestic policies and procedures? Answers to these questions will not come until national reactions to a major dispute can be observed.

The dispute settlement process of NAFTA is being used. In response to the Uruguay Round agreement, Canada removed non-tariff trade barriers and replaced them with new tariffs on dairy, poultry, and barley products, and on margarine. Some new tariffs exceeded 200 percent. The United States claimed that NAFTA did not allow new tariffs. Canada claimed that in this case the Uruguay Round commitments superseded NAFTA. A NAFTA panel was established to resolve the issue. A final report released in December 1996 over Canadian tariffs on dairy and poultry ruled unanimously in favor of Canada.

After the Uruguay Round, the United States also established new tariffs on imports of dairy and other products. But according to a USDA official, "U.S. products under the tariff-rate quota face the lower NAFTA tariff, which will be phased out by 1998" (13).

More North-South Marketing Infrastructure

Increased U.S.-Canadian agricultural trade is creating a demand for better infrastructure for moving goods north and south. As these facilities are built and upgraded, the cost of north-south trade will fall and the volume will continue to grow. Expect rerouting of traditional marketing flows of some goods within both countries.

Free Trade Narrows Domestic Policy Options

An end to border barriers diminishes policy options for income protection to agriculture in the future. Freer trade is inconsistent with, and eventually tends to remove, domestic commodity programs. To be sure, free trade can be consistent with "decoupled" policy instruments such as direct payments. But these are difficult to maintain in the face of pressure to restrain government outlays.

Toward Monetary Union

Recent year-to-year fluctuations in bilateral agricultural trade can be attributed in part to changes in the value of the Canadian dollar relative to the U.S. dollar. High trade barriers--especially nontariff barriers--buffer the agricultural sectors on both sides of the border from exchange rate shocks. Now that the barriers are reduced, there is less protection from exchange rate risk. For example, a 25 percent decline in the real value of the Canadian dollar, as occurred between 1991 and 1995, would roughly translate into a 25 percent drop in the price of Canadian goods exported to the U.S. market--a major improvement in their competitiveness. On the other hand, U.S. goods exported to Canada could cost 25 percent more in Canada.

The exchange rate could emerge as an especially troublesome risk factor with the decline of other trade barriers. With an unpredictable shift in the exchange rate, enterprises with a comparative advantage and making a profit on exports unexpectedly could find themselves taking losses on exports even though technology, factor endowments, and management remain unchanged. This type of instability adds economic trauma and reduces the benefits to both countries from freer trade. Eliminating exchange rate risk deserves high priority in Canadian-United States trade relations.

Similar pressures have pushed the European Union toward monetary union. Because of greater similarities in cultural and other characteristics between the U.S. and Canada than between many countries of Western Europe, a Canadian-U.S. monetary union would seem to be as feasible economically as an EU monetary union.

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Table 1. Provisions of CFTA Affecting Agriculture

Item	Action specified in CFTA
Technical regulations	Committed to harmonize
Dispute settlement	Defined procedures, using binational panels, for resolving disputes
Tariff reductions	* Cannot increase duties on products that were duty-free prior to 1/1/89 * Category A products: Immediate duty removal (1/1/89) * Category B products: Duty eliminated in 5 equal annual stages (duty free on 1/1/93) * Category C products: Duty eliminated in 10 equal annual stages (duty-free on 1/1/98)
Export subsidies	Prohibited on U.S.-Canada trade
Canada's transportation subsidy	Canada's Western Grain Transportation Act subsidy removed on grain and oilseed exports shipped to the U.S. through Canadian west coast ports (removed August 1, 1995)
Meat import laws	Each country exempts the other from its meat import laws
Wheat	Canada removed import license in 1991
Barley	Canada will remove import license when U.S. support level is less than or equal to Canada's
Oats	Canada removed import license in 1989
Chicken	Canada increased global import quotas from 6.3% to 7.5% of previous year's production
Turkey	Canada increased global import quota from 2.0% to 3.5% of previous year's production
Shell eggs	Canada increased global import quota from 0.68% to 1.65% of previous year's production
Sugar-containing products	U.S. agreed not to restrict any Canadian product containing 10% or less sugar, dry weight
Fruits and vegetables	Special "snapback" provisions to protect domestic market from sharp short-run drops in import prices
Wine	Canada agreed to liberalize wine listing, pricing, and distribution practices in order to afford improved access for U.S. wines.

Source: (3)

Table 2. Agricultural Trade Between Canada and the United States, 1995

Category	U.S. exports to Canada	Canadian exports to United States
	(million U.S. dollars)	
Live animals	98	1035
Animal products	936	1090
Grains and products	977	1292
Fruit & juices, vegetables	2219	536
Oilseeds and products	357	613
Sugar and related products	166	178
Nursery products	108	124
Other beverages	479	529
Other	398	162
	-----	-----
Total	5738	5559

Source: (4).

Table 3. Results of Regression Analysis using USDA Trade Data.

Equation characteristics	Dependent variable	
	U.S. ag. exports to Canada	Canadian ag. exports to U.S.
Number of observations	27	27
Degrees of freedom	23	23
Real exchange rate:		
coefficient	-1017	1020
T value	-1.27	0.88
Dummy for CFTA/NAFTA:		
coefficient	2379	1566
T value	10.28	4.69
Linear Trend		
coefficient	97	107
T value	4.29	3.27
R squared	0.97	0.94

Form of equation: Simple linear regression.

Units:

Exports and imports: million US dollars.

Real exchange rate: Canadian dollars per US dollar.

Values range from 0.85 to 1.39.

Dummy: 0 for years without CFTA/NAFTA, 1 for years with CFTA/NAFTA.

Note that 1989 = 0, i.e., a one-year lag in CFTA/NAFTA's impact was assumed.

Linear Trend: 1969 = 1, 1970 = 2, ..., 1995 = 27.

Sources: Exports, (1); real exchange rates, (5).

Table 4. Results of Regression Analysis using STATISTICS CANADA Trade Data.

Equation characteristics	Dependent variable	
	U.S. ag. exports to Canada	Canadian ag. exports to U.S.
Number of observations	27	27
Degrees of freedom	23	23
Real exchange rate:		
coefficient	-1839	472
T value	-2.86	0.34
Dummy for CFTA/NAFTA:		
coefficient	481	2203
T value	2.59	5.62
Linear Trend		
coefficient	186	120
T value	10.30	3.13
R squared	0.98	0.94

Form of equation: Simple linear regression.

Units:

Exports and imports: million US dollars.

Real exchange rate: Canadian dollars per US dollar.

Values range from 0.85 to 1.39.

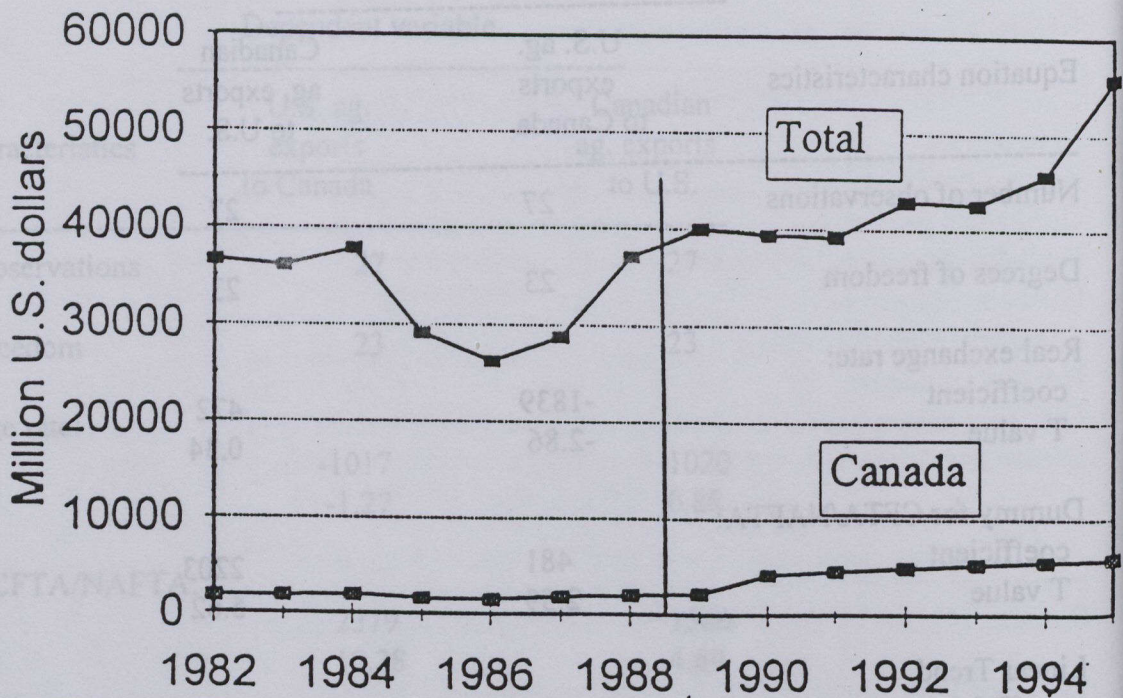
Dummy: 0 for years without CFTA/NAFTA, 1 for years with CFTA/NAFTA.

Note that 1989 = 0, i.e., a one-year lag in CFTA/NAFTA's impact was assumed.

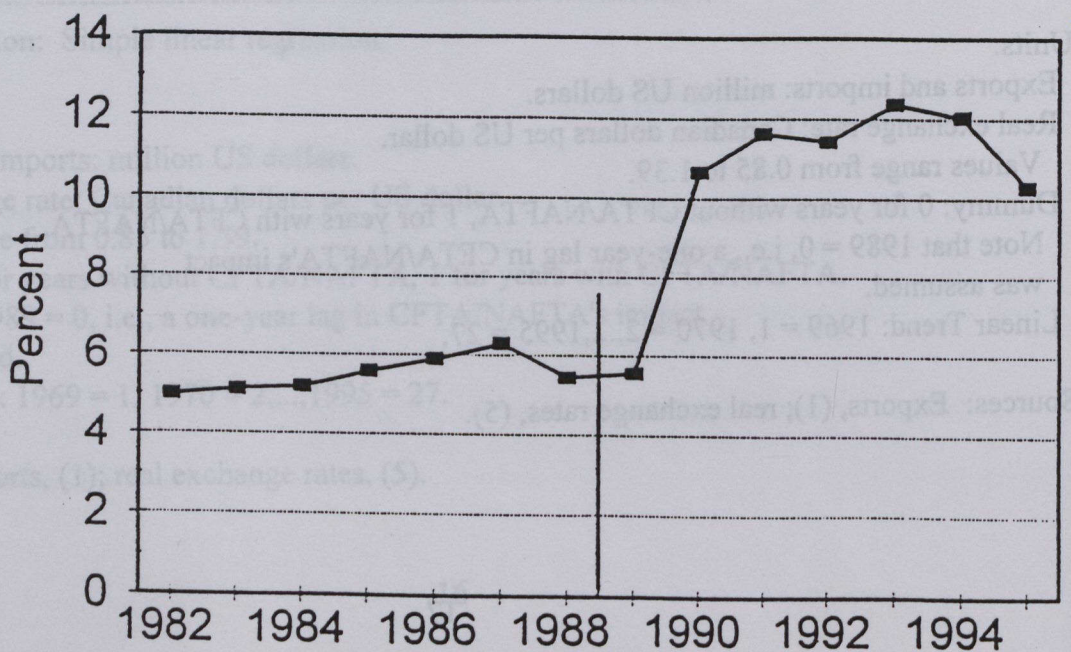
Linear Trend: 1969 = 1, 1970 = 2, ..., 1995 = 27.

Sources: Exports, (1); real exchange rates, (5).

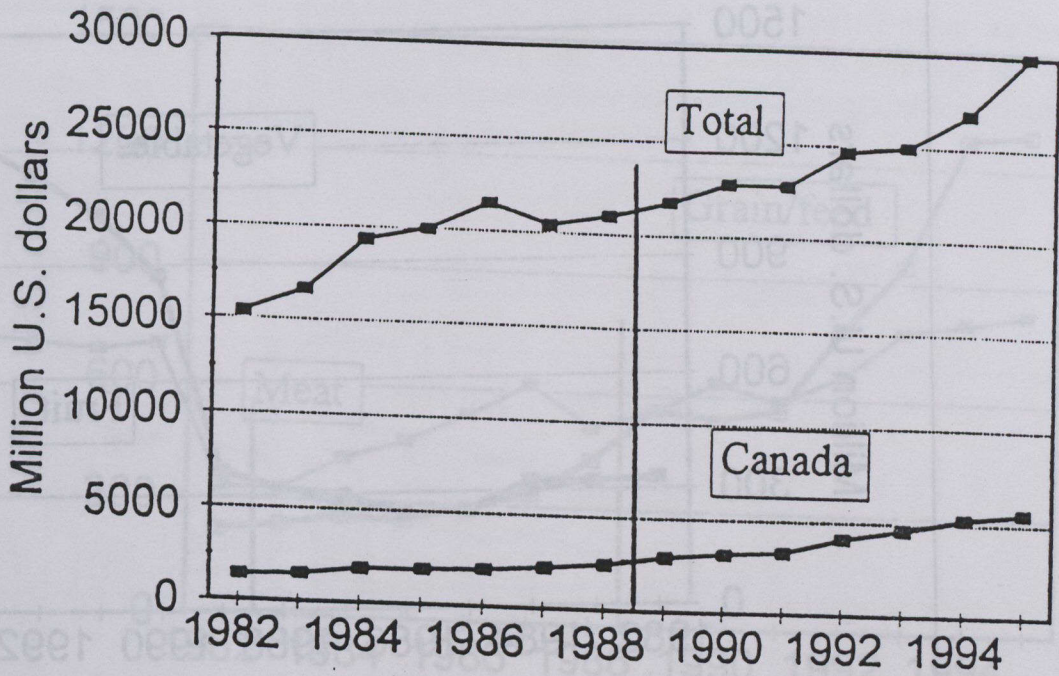
**Figure 1. U.S. Ag. Exports
Total and to Canada**



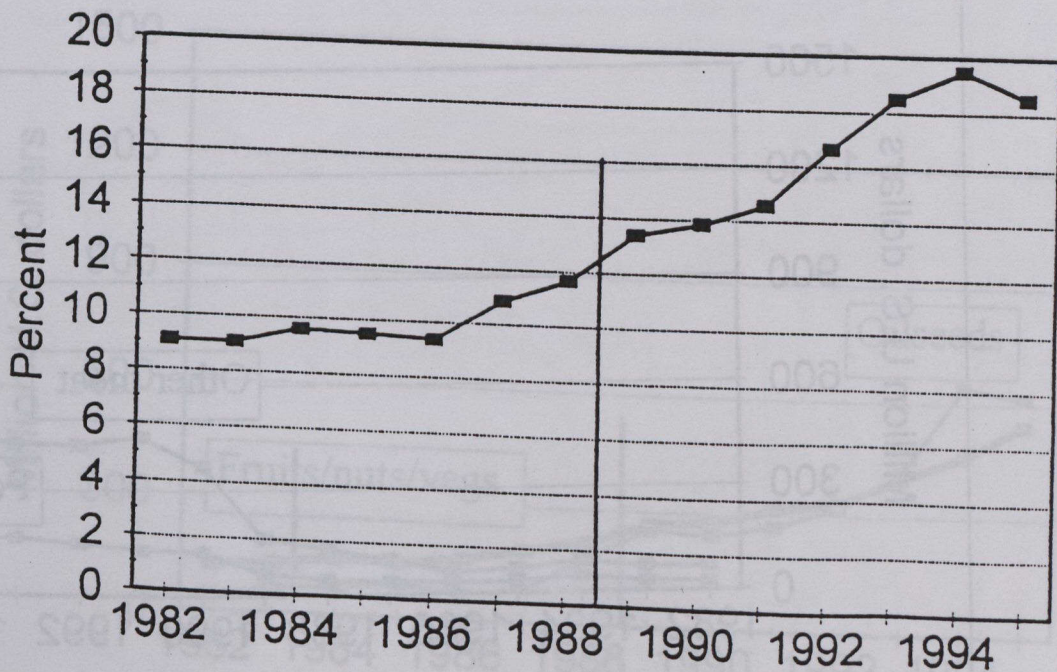
**Figure 2. U.S. Ag. Exports
Share to Canada**



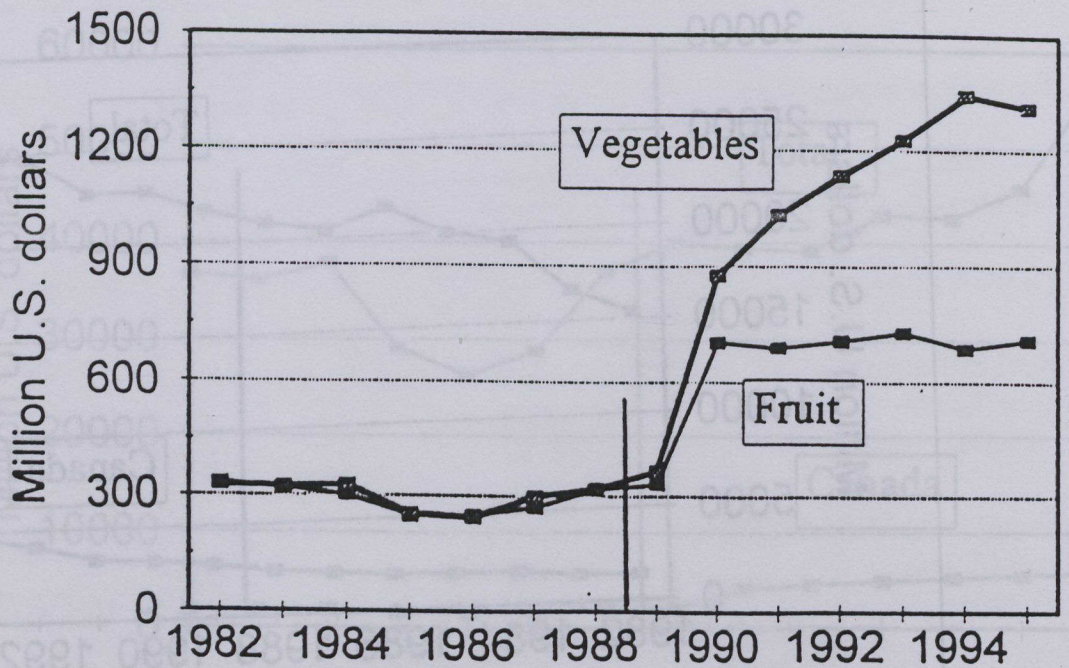
**Figure 3. U.S. Ag. Imports
Total and from Canada**



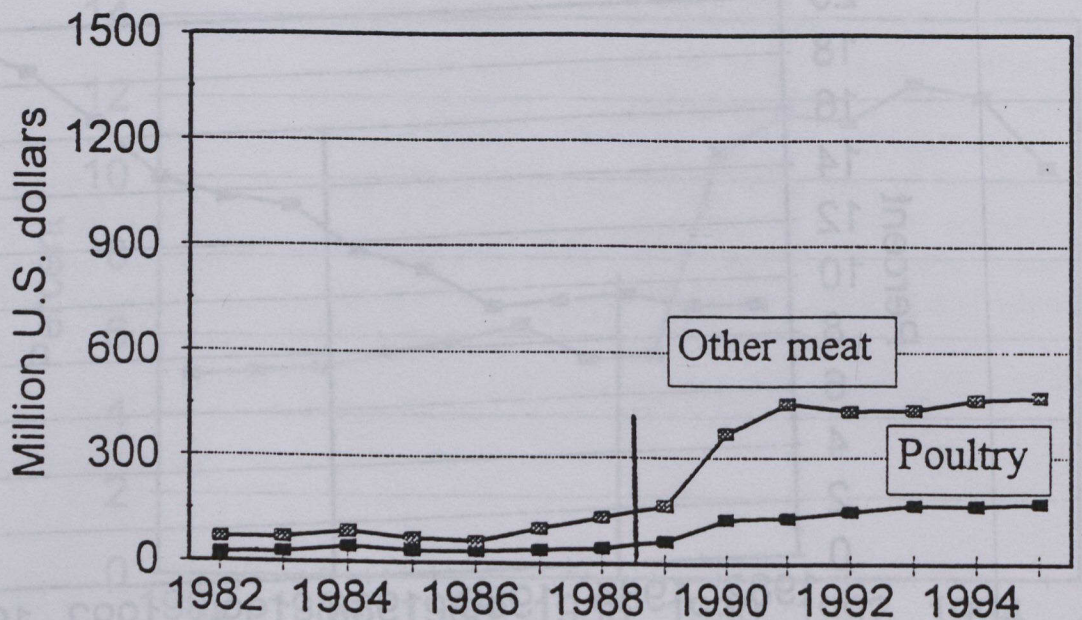
**Figure 4. U.S. Ag. Imports
Share from Canada**



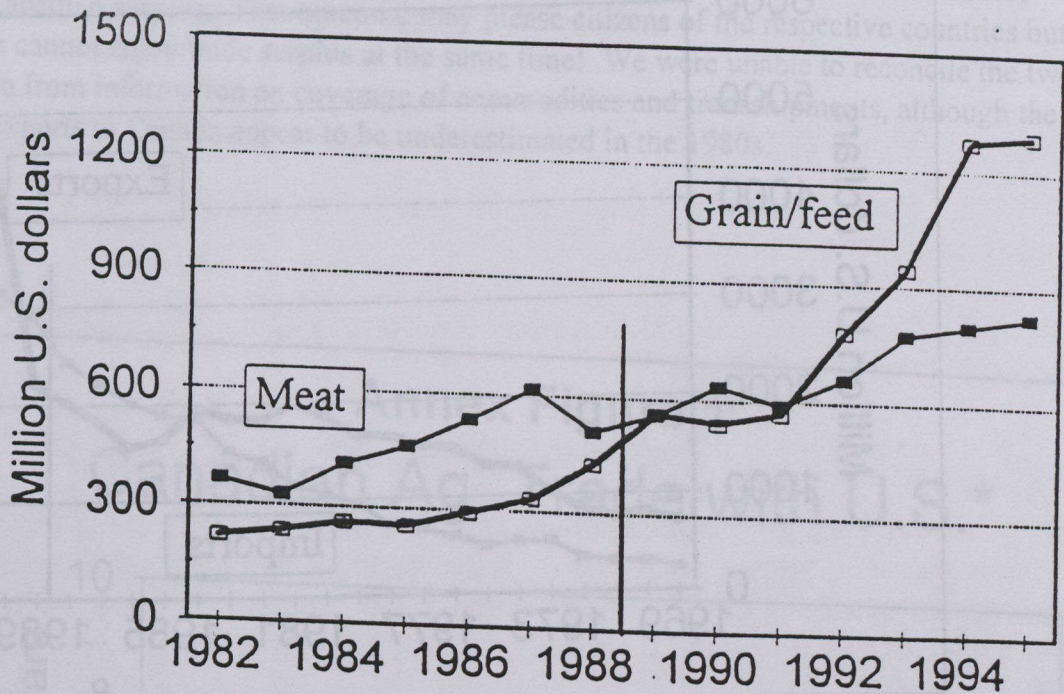
**Figure 5. U.S. Ag. Exports to Canada
Fruit and Vegetables/Products**



**Figure 6. U.S. Exports to Canada
Poultry and Other Meat**



**Figure 7. U.S. Ag. Imports from Canada
Meat and Grain/feed**



**Figure 8. U.S. Ag. Imports from Canada
Oilseeds and Fruits/nuts/vegs.**

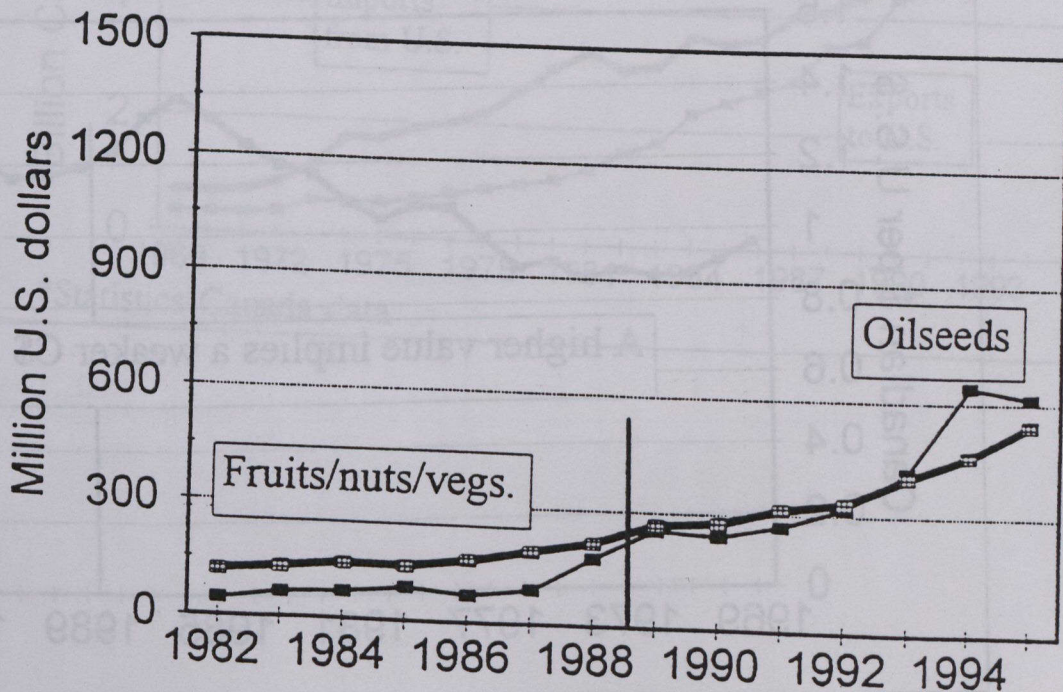


Figure 9. U.S. Ag Trade with Canada
Imports and Exports

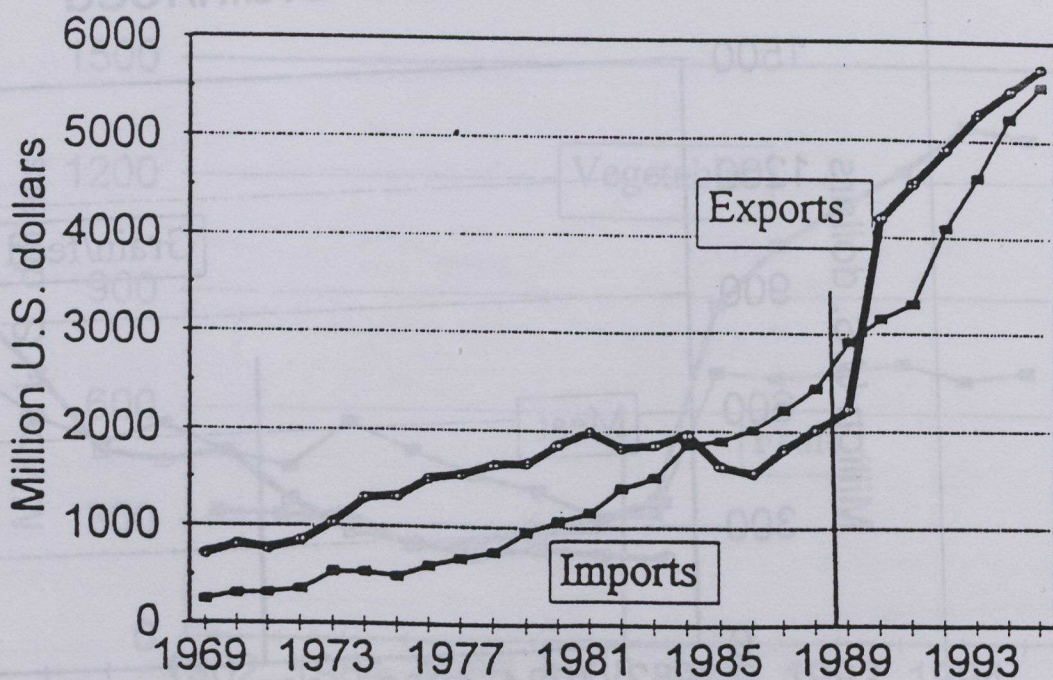
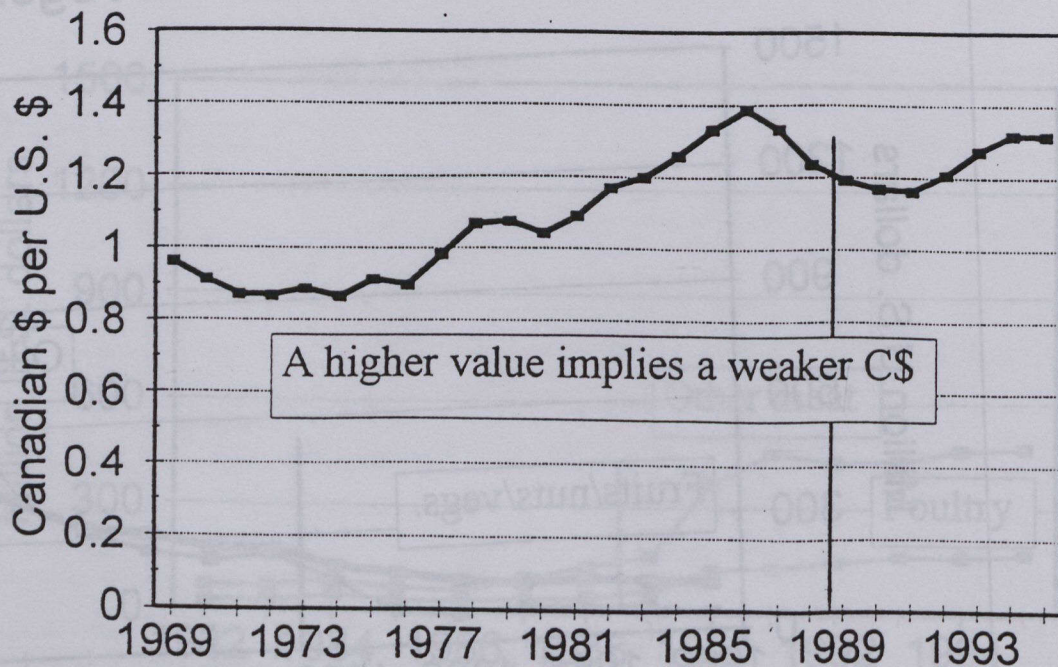
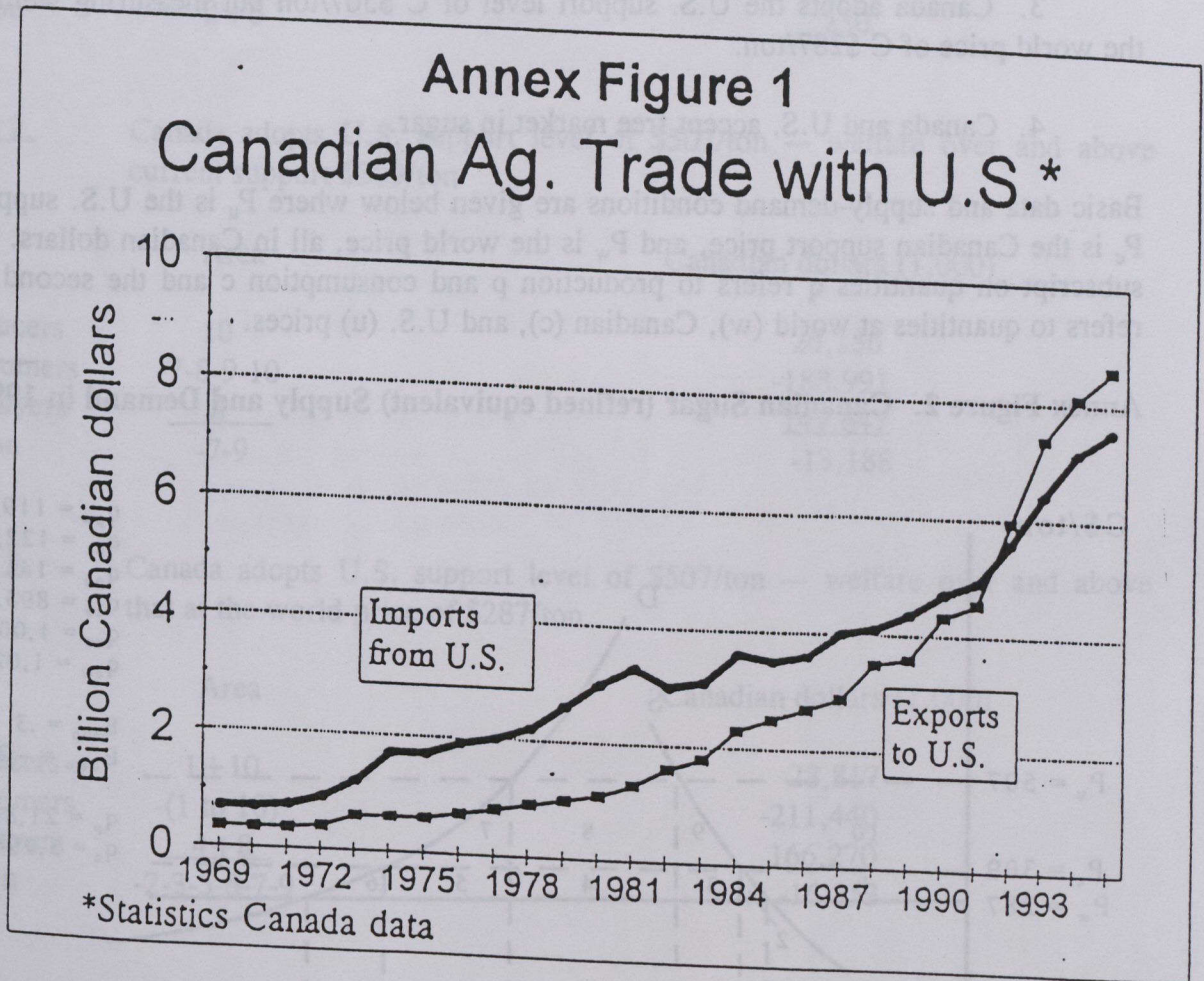


Figure 10. Real Exchange Rate
Canadian dollars per U.S. dollar



ANNEX A

Text Figure 9 and Annex Figure 1 show differences in trade data compiled by the U.S. and Canada. The U.S.-source data show a U.S. trade surplus in recent years while Canada-source data show a Canadian surplus. That outcome may please citizens of the respective countries but both countries cannot enjoy trade surplus at the same time! We were unable to reconcile the two sources of data from information on coverage of commodities and transshipments, although the U.S. data on exports to Canada appear to be underestimated in the 1980s.



ANNEX B

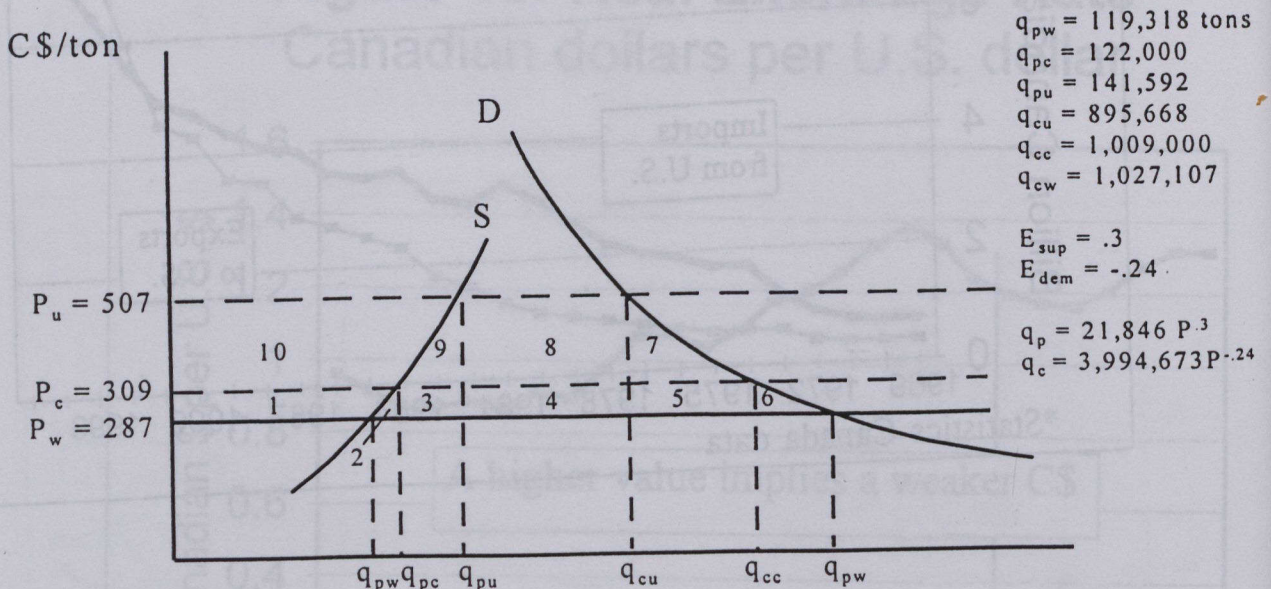
Illustration of Welfare Analysis Methodology: Canadian Sugar Policy

The following analysis of Canadian sugar policy in 1990 assumes Canada is a "small country", influenced by world (and U.S.) sugar prices but not influencing sugar prices. Four scenarios are considered:

1. An end to the modest Canadian tariff of C \$22/ton so that Canada is a free market.
2. Canada adopts the U.S. support level of C \$507/ton over and above its 1990 support rate of C \$309/ton.
3. Canada adopts the U.S. support level of C \$507/ton but measuring welfare above the world price of C \$287/ton.
4. Canada and U.S. accept free market in sugar.

Basic data and supply-demand conditions are given below where P_u is the U.S. support price, P_c is the Canadian support price, and P_w is the world price, all in Canadian dollars. The first subscript on quantities q refers to production p and consumption c and the second subscript refers to quantities at world (w), Canadian (c), and U.S. (u) prices.

Annex Figure 2. Canadian Sugar (refined equivalent) Supply and Demand in 1990.



Source: Quantities and prices (11, pp. 94, 95); elasticities (15)

Welfare Analysis Canadian Sugar Policy in 1990

Scenario 1. Canada ends support so price falls from \$309/ton to \$287/ton, the world price

Gain to:	Area (Annex figure 2)	Canadian dollars (1,000)
Producers	-1	-2,661
Consumers	+1 to 10	22,449
Taxpayers	<u>-4-8</u>	<u>-19,558</u>
Nation	2+6	230

Scenario 2. Canada adopts U.S. support level of \$507/ton — welfare over and above current support \$309/ton

Gain to:	Area	Canadian dollars (1,000)
Producers	10	26,156
Consumers	-7-8-9-10	-188,991
Taxpayers	<u>8</u>	<u>149,647</u>
Nation	-7-9	-13,188

Scenario 3. Canada adopts U.S. support level of \$507/ton — welfare over and above that at the world price of \$287/ton

Gain to:	Area	Canadian dollars (1,000)
Producers	1+10	28,817
Consumers	-(1 to 10)	-211,440
Taxpayers	<u>4+8</u>	<u>166,270</u>
Nation	-2-3-5-6-7-9	-16,353

Area values (C\$1,000)

1	2,661	6	200
2	30	7	11,245
3	432	8	149,646
4	16,627	9	1,944
5	2,499	10	26,155

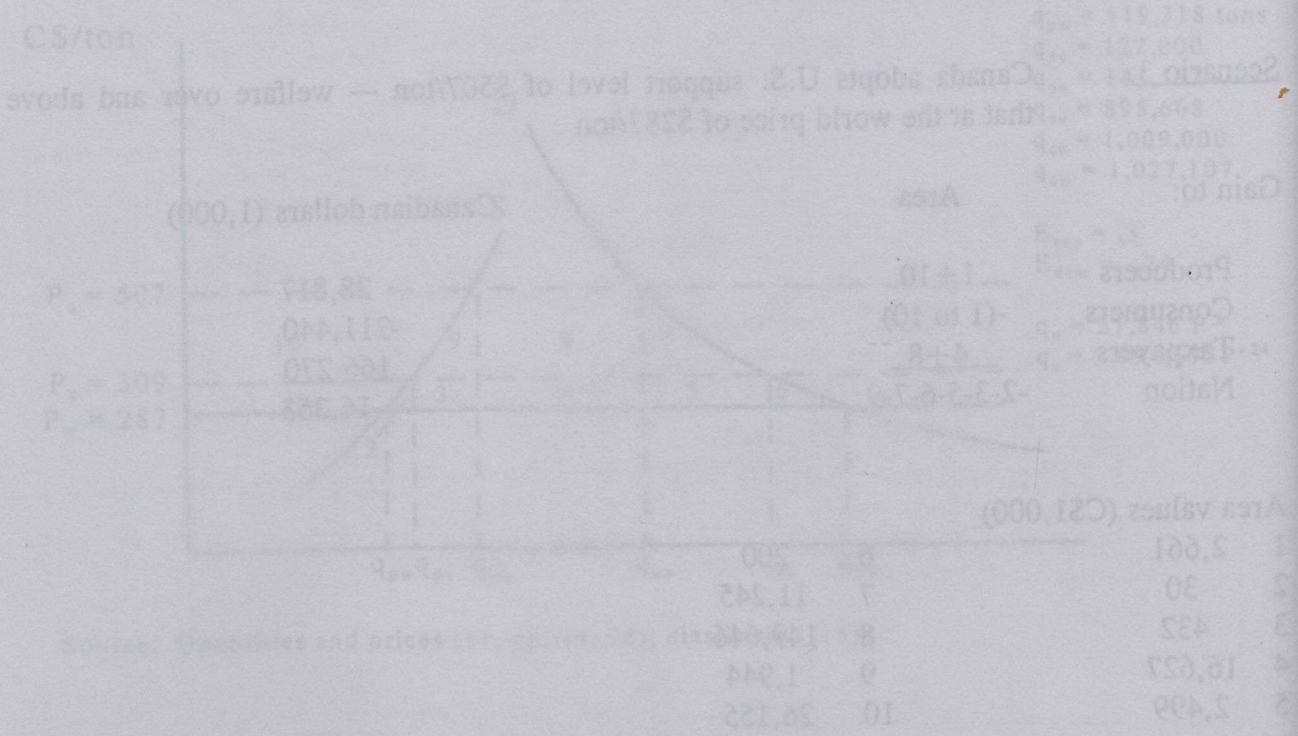
Scenario 4. Canada and United States liberalize sugar trade; world sugar price goes to C \$400/ton. Gain above current policy by price P_c going from C \$380 to C \$400/ton.

Gain to:	Area	Canadian dollars (1,000)
Producers	10	11,549
Consumers	-7-8-9-10	-89,061
Nation	-7-8-9	-77,512

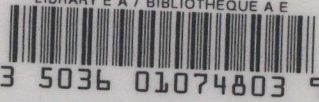
The following analysis of Canadian sugar policy in 1990 assumes Canada is a "small country" in the world market. The world price is assumed to be constant at C \$380/ton. The current support price is C \$380/ton. The current supply and demand curves are given in the table below. The current level of support is C \$380/ton. The current level of support is C \$380/ton. The current level of support is C \$380/ton.

Scenario 2. Canada adopts U.S. support level of C \$250/ton — welfare over and above current support C \$380/ton. Basic data and supply-demand conditions are given in the table below. P_c is the Canadian support price, and P_w is the world price. The current support price is C \$380/ton. The current level of support is C \$380/ton. The current level of support is C \$380/ton.

Annex Figure 2. Current Support Price and Consumer Surplus. The current support price is C \$380/ton. The current level of support is C \$380/ton. The current level of support is C \$380/ton.



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