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An Analysis of Canada-U.S. Free Trade Agreement:

Implications for Canadian, U.S.

and Southeastern Agriculture*

FS 89-45

by

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DIVISION OF AGRICULTURAL ECONOMICS

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UNIVERSITY OF GEORGIA

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Abstract

A small world trade liberalization model was used to estimate the impact of the Canada-U.S. Free Trade Agreement on net agricultural trade. Canadian imports of poultry meat, corn, soybean oil, and fresh strawberries increase while exports of pork and coarse grains improve as a result of the Agreement. U.S. soybean meal exports increase but bean exports decline while Southeastern poultry meat and egg exports rise.

An Analysis of Canada-U.S. Free Trade Agreement: Implications for Canadian, U.S. and Southeastern Agriculture

Introduction

The Canada-U.S. Free Trade Agreement which went into effect on January 1, 1989 is expected to bring significant economic benefits to Canada and the United States. The new Agreement states that all agricultural tariffs will be eliminated in stages within 10 years. Other articles in the Agreement provide more access to Canadian markets for U.S. farm products including the conditional elimination of Canadian import licenses for U.S. wheat, barley, oats and grain products and secure and enhanced access of Canadian products to U.S. markets (Normile and Goodloe 1988). The two countries will exempt each other from meat import laws. Tariffs on hams, sausages and alfalfa meal will be phased out immediately (Agriculture Canada, p. 15). However, a conditional "snapback" provision to the Most Favored Nation tariff rate is allowed for selected fruits and vegetables during the next 20 years. Moreover, both countries have agreed on "common objectives" with respect to trade distorting agricultural subsidies within the Multilateral Trade Negotiations. Neither country will use direct export subsidies on agricultural products shipped to the other. However, they "have agreed to take into account the export interests of the other when using any export subsidy on agricultural goods exported to third countries" (Agriculture Canada, p. 15).

Both countries have agreed to minimize the impact of nontariff barriers (technical regulations) which interfere with trade while still protecting human, animal and plant health, form a binational panel to review trade disputes, consult on agricultural issues semiannually, and retain their GATT rights and obligations with respect to issues not otherwise provided for in the Agreement.

While the comprehensive changes envisioned in the Agreement are important, the analysis in this paper is limited to the elimination of agricultural tariffs on 23 commodity groups. The objective is to identify and measure the impact of tariff removal on selected commodities between Canada and the United States.

The impacts of trade barrier removal between the U.S. and Canada are expected to be highly variable among commodity groups (Blandford and Sorenson; Mathia; Coffin). There seems little doubt that reduction or elimination of the remaining barriers will increase trade flows (Menzie and Prentice 1985, p. 12). Because of the relatively large size of the U.S. market, impacts from adjustments occurring as a result of the Free Trade Agreement will be much less for the U.S. than for Canada.

Methodology and Procedure

The Static World Policy Simulation (SWOPSIM) Model was used to analyze the effect of changes in trade policies on U.S.-Canadian bilateral trade. The SWOPSIM model framework developed by Roningen (1986) follows the logic of a nonspatial equilibrium model which assumes that domestic and traded goods are perfect substitutes in consumption.

SWOPSIM is a microcomputer-based spreadsheet framework that uses a variant of the Gauss-Seidel algorithm to create static world policy simulation models. SWOPSIM solves for values at the end of a time period which is defined by the parameterization of the model. Models contain matrices of own and cross price elasticities for each commodity in each country/region which can be viewed as a intermediate-run static version of a dynamic model.

An adjusted form of the SWOPSIM model, called a small world agricultural trade liberalization (STLB) model (Roningen, Sullivan and Wainio), containing four regions and 23 commodities was developed to evaluate the impact of tariff removal

under the Agreement. The four regions include Canada (CN), the Southeastern region of the United States (SE), rest-of-the-United States (US) and Rest-of-the-World (RW). The Southeast was defined as a separate region in the analysis to consider the anticipated impact of the Agreement on selected regional commodity groups such as poultry meat and eggs.

Ten states were included in the Southeast region. Twenty-three agricultural commodities or commodity groups, representing almost 90% of the total value of U.S. agricultural production, are included in the model -- beef, pork, poultry meat, eggs, milk, butter, cheese, milk powder, wheat, corn, other coarse grains, rice, soybeans, soybean meal, soybean oil, other oilseeds, other oilmeals, other oils, cotton, sugar, tobacco, fresh potatoes and fresh strawberries.

The STLB model is parameterized to reproduce a 1986 database for each country/region's production, consumption, prices and trade. When measures of support or protection for agricultural commodities are removed, the model recalculates domestic supply and demand levels in all countries, re-balancing world trade, production, consumption, and prices in the process. The tariffs were removed from the trade prices in this analysis and the model rebalanced trade among the four regions.

The model contains constant price elasticity functions for domestic supply and demand for each commodity in each country region. Canadian and U.S. own and cross-price elasticities were obtained from USDA's trade liberalization model (Roningen 1987). The SE region uses the same basic elasticity matrices as the US but adjusts for differences in supply response where appropriate. Supply elasticities for fresh potatoes and strawberries were taken from Askari and Cummings, and the demand elasticities were obtained from Sarris (1984). Data on tariffs and border protection measures were obtained from Sargent and Meyer (1987), Dixit and Roningen (1987), and Coffin (1987).

Both Canada and the United States levy similar tariffs on agricultural products but differ by stage of processing. The most highly protected U.S. and Canadian commodities are dairy products, poultry meat, fresh fruits and vegetables, and selected high-value products. Tariff rates were realigned under multilateral trade negotiations prior to the Agreement (Mathia, 1987). The tariffs, converted into US dollars per metric ton, were simply defined as negative import subsidy equivalents in the model. All tariffs were removed from trade prices simultaneously. The results indicate potential equilibrium bilateral trade conditions in 1998, ceteris paribus.

Tariff Removal on All Agricultural Commodities

As a result of the full effect of the Agreement, price changes are more pronounced in poultry meat than in other livestock commodities. Canadian imports of poultry meat increase 233%; SE poultry meat exports increase 15% (table 1). As expected, domestic producer prices of beef and poultry meat in Canada decrease 1% and 11%, respectively. Canadian consumer prices of poultry meat decline 6.5%, while beef prices decline less than one percent. Canadian pork exports increase about 7% in the final analysis.

The removal of tariffs on dairy products does change trade flows in the regions. Canadian cheese imports increase only 63% after tariff removal (table 2). Southeastern cheese imports increase only 7.8% over the base year while milk imports increase 6.4%, supporting the general trend of the SE region as a deficit region in dairy products.

In terms of significant cross commodity effects from bilateral trade liberalization, Canadian corn imports increase 9% (table 3). Since tariffs are phased out, the domestic producer prices in the SE decrease; wheat and corn prices

decline 5.5 and 14.5%, respectively. As a result of the Agreement, the SE region increases its imports of wheat and corn by 2.4% and 12.3%, respectively.

Neither Canada nor the U.S. imposed tariffs on soybeans prior to the trade agreement but both countries maintained tariffs on soybean oil of 15% and 22.5%, respectively. Canadian imports of soybean meal are duty free but the U.S. has a tariff of 30 cts/cwt on soybean meal. Canadian imports of soybean oil increase 361% due to the removal of tariffs on both U.S. and Canadian edible oils (table 4). Canadian imports of soybeans for crushing decrease 69%. This is exactly as expected since there would be less incentive to import beans for crushing in Canada after the Agreement. Canada had expected Canola oil exports to increase 10%, beginning in 1989 (Agriculture Canada 1988, p. 22). However the results of this analysis indicate an increase in Canadian exports of other oilseed meals and oil of 1.36% and 1.35%, respectively. After tariff removal, the US increases its exports of soybean oil 16.8%. The SE region exports more beans but meal imports increase (table 5).

The creation of a free trade area did not significantly change the relative trade situation in cotton, sugar, and tobacco (table 6). Sugar exports from the SE region increased 3.5% but this is not expected to create any important changes in trade flows.

Generally, seasonal tariffs on fresh vegetables are relatively high in both countries with fixed rate tariffs of 35 cts/cwt on fresh potatoes. The results of tariff removal indicated a modest impact (less than 1%) on exports of fresh potatoes in Canada and the US region while SE imports increase 2% (table 7). While aggregate trade flows of fresh potatoes may not change much due to the Agreement, there could be improvements in regional exports and imports, i.e. Canadian exports to the Eastern U.S. and Western U.S. exports to the Pacific provinces (Aylsworth 1989, pp.40-41).

Both Canada and the U.S. apply seasonal tariffs of 10% and 0.75 cts/lb, respectively, on fresh strawberries. Imports of fresh strawberries increase 43% in Canada as a result of the trade Agreement, while producer and consumer prices for strawberries drop 12% and 10%, respectively, from base year prices (table 8). Some Canadian producers would suffer revenue losses as a result of the trade Agreement which explains why "snapback" provisions will remain in effect for another two decades on vegetables and fresh fruits.

Summary

A 4-region, 23-commodity small world agricultural trade liberalization model within the SWOPSIM framework was used to measure the impact of tariff removal between the United States and Canada. The tariffs were simply defined as negative import subsidy equivalents in the model and then removed from the trade prices. The model recalculates domestic supply and demand levels in all regions, re-balancing world trade, production, consumption and prices.

In summary, the impacts of the Canada-U.S. Free Trade Agreement on selected commodity groups are significant. Canadian imports of beef and veal, poultry meat, soybean oil and fresh strawberries increase. Furthermore, the results indicate larger trade flows for selected products and declines in producer and consumer prices in Canada, U.S. and Southeast regions.

Since the US's share of Canadian agricultural imports averaged 60% in the 1980s, the impact of trade liberalization will be greater in Canada in selected commodities than in the US or the SE region, although the change in trade value will be greater in the US than in the other regions (table 9). Nevertheless, Canadian dependence on the U.S. market will be increasing in the future. The tariff phaseout, together with a reduction in non-tariff barriers and harmonizing domestic agricultural policies, will create more export opportunities in selected

commodities for both the United States and Canada, and it will create the world's largest free trade market.

Table 1. Impact of Tariff Removal on Beef, Pork and Poultry Products Between Canada and the United States, 1986 Base Year

Region	Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
		---------- percentage change ----------						
Canada								
	Beef	.86	-1.23	-.74	-.54	.40	140.98	IM
	Pork	.34	.30	.17	1.17	-.40	6.70	EX
	Poultry meat	2.18	-10.77	-6.50	-7.63	4.55	233.00	IM
	Eggs	.81	-1.46	- .96	- .73	.29	51.12	IM
U.S.[b]								
	Beef	.86	-1.38	-.83	-.96	.45	55.83	EX
	Pork	.34	.31	.17	.20	-.36	21.30	EX
	Poultry meat	2.18	-7.91	-4.69	-5.32	2.66	126.30	IM
	Eggs	.81	-3.54	-2.44	-1.86	.87	51.16	IM
Southeast								
	Beef	.86	-3.17	-.83	-.61	.63	4.85	IM
	Pork	.34	.45	.17	4.64	-.18	-6.54	IM
	Poultry meat	2.18	2.89	1.04	3.71	-.64	14.62	EX
	Eggs	.81	.84	.81	1.68	-.28	8.83	EX
Rest-of-World								
	Beef	.86	.86	.47	.30	-.24	22.87	EX
	Pork	.34	.34	.17	-.07	.10	-31.12	EX
	Poultry meat	2.18	2.18	1.20	1.42	-.79	-193.58[c]	IM
	Eggs	.81	.81	.48	.22	-.12	-117.41	IM

a) Action indicates the trade situation for each commodity in each region, such as imports(IM) and exports(EX).
b) The U.S. region is the rest of the United States, excluding 10 southeastern states.
c) The decreasing imports by -193.58% makes the Rest-of-World region become an exporting region rather than an importing region.

Table 2. Impact of Tariff Removal on Dairy Products Between Canada and the United States, 1986 Base Year

Region	Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
		---------- percentage change ----------						
Canada								
	Milk	.17	.11	.05	.03	-.44	[b]	[b]
	Butter	.20	.07	.05	.27	-.04	[b]	[b]
	Cheese	.92	-1.46	-1.01	-1.75	.74	63.13	IM
	Milk powder	.14	.07	.05	.28	-.02	.48	EX
U.S.[c]								
	Milk	.17	.14	.07	.00	.09	-.77	EX
	Butter	.20	.08	.06	-.22	-.04	-.80	EX
	Cheese	.92	.53	.39	.37	-.24	3.69	EX
	Milk powder	.14	.08	.07	-.23	-.02	-.37	EX
Southeast								
	Milk	.17	.11	.06	.93	-2.87	-6.42	IM
	Butter	.20	.07	.10	4.99	- .06	- .11	IM
	Cheese	.92	-9.80	-9.65	-9.12	6.28	7.84	IM
	Milk powder	.14	.06	.08	4.66	-.03	-.11	IM
Rest-of-world								
	Milk	.17	.17	.09	-.02	.09	[b]	[b]
	Butter	.20	.20	.16	-.01	-.02	-2.62	IM
	Cheese	.92	.92	.64	.12	-.26	24.90	EX
	Milk powder	.14	.14	.11	.00	-.02	-.26	IM

a) Action indicates the trade situation for each commodity in each region, such as imports(IM) and exports(EX).
b) It was assumed that supply equaled demand and thus there was no change in net trade.
c) The U.S. region is the rest of the United States, excluding 10 southeastern states.

Table 3. Impact of Tariff Removal on Wheat, Corn, Coarse Grains, and Rice Between Canada and the United States, 1986 Base Year

Region / Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
	---------- percentage change ----------						
Canada							
Wheat	.28	.17	.17	-.09	-1.48	.61	EX
Corn	1.05	-2.69	-2.96	-.63	.12	9.11	IM
Coarse grain	.20	.11	.18	-.09	-.71	1.04	EX
Rice	.13	.13	.07	.01	-.02	-.02	IM
U.S.[b]							
Wheat	.28	.12	.16	.04	-.42	.40	EX
Corn	1.05	.55	.84	.24	-.99	3.14	EX
Coarse grain	.20	.10	.14	.19	-.76	6.84	EX
Rice	.13	.04	.06	.02	-.02	.03	EX
Southeast							
Wheat	.28	-5.59	-7.70	.72	1.42	2.44	IM
Corn	1.05	-14.51	-9.48	-6.73	3.31	12.38	IM
Coarse grain	.20	-4.22	-3.48	-1.56	-.02	1.45	IM
Rice	.13	.09	.06	.04	-.02	-.17	IM
Rest-of-World							
Wheat	.28	.28	.20	.00	.03	.39	IM
Corn	1.05	1.05	.94	.28	.07	-1.38	IM
Coarse grain	.20	.20	.18	-.04	.22	5.46	IM
Rice	.13	.13	.07	-.02	-.02	.04	IM

a) Action indicates the trade situation for each commodity in each region, such as imports(IM) and exports(EX).
b) The U.S. region is the rest of the United States, excluding 10 southeastern states.

Table 4. Impact of Tariff Removal on Soybean Products Between Canada and the United States, 1986 Base Year

Region	Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
		---------- percentage change ----------						
Canada								
	Soybean	.15	.11	.14	.24	-1.32	-69.46	IM
	Soybean meal	1.20	1.20	.96	-4.85	.69	7.30	IM
	Soybean oil	3.70	-28.10	-14.05	-4.85	6.25	361.50	IM
U.S.[b]								
	Soybean	.15	.13	.14	.00	.39	-.57	EX
	Soybean meal	1.20	1.20	.96	1.18	-2.65	10.83	EX
	Soybean oil	3.70	3.70	1.85	1.18	-.79	16.83	EX
Southeast								
	Soybean	.15	.13	.10	1.92	-2.51	11.53	EX
	Soybean meal	1.20	1.23	.88	-9.36	1.90	-64.11	EX
	Soybean oil	3.70	-44.26	-22.00	-9.36	9.64	685.90	IM
Rest-of-World								
	Soybean	.15	.15	.14	-.08	.36	1.30	IM
	Soybean meal	1.20	1.20	.96	.02	.19	1.34	IM
	Soybean oil	3.70	3.70	1.85	.02	-1.45	-27.30	IM

a) Action indicates the trade situation for each commodity in each region, such as import(IM) and exports(EX).
b) The U.S. region is the rest of the United States excluding 10 southeastern states.

Table 5. Impact of Tariff Removal on Other Oilseeds, and Products Between Canada and the United States, 1986 Base Year

Region / Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
	---------- percentage change ----------						
Canada							
Other oilseeds	1.27	1.09	1.14	.85	-.69	2.12	EX
Other oilmeal	2.48	2.48	1.99	-.97	-.63	-1.36	EX
Other oil	.04	.04	.02	-.97	-.77	-1.35	EX
U.S.[b]							
Other oilseeds	1.27	-3.39	-3.80	-1.91	.67	1.26	IM
Other oilmeal	2.48	-5.63	-4.51	.62	2.54	2.92	IM
Other oil	.04	-1.56	- .78	.62	1.15	1.20	IM
Southeast							
Other oilseeds	1.27	.46	.25	1.11	.15	1.38	EX
Other oilmeal	2.48	2.26	2.26	.52	1.48	.21	EX
Other oil	.04	.04	.04	.52	-7.90	8.95	EX
Rest-of-World							
Other oilseeds	1.27	1.27	1.14	.25	.32	2.12	IM
Other oilmeal	2.48	2.48	1.99	.00	-.09	-8.84	IM
Other oil	.04	.04	.02	.00	.04	-2.11	EX

a) Action indicates the trade situation for each commodity in each region, such as import(IM) and exports(EX).
b) The U.S. region is the rest of the United States excluding 10 southeastern states.

Table 6. Impact of Tariff Removal on Cotton, Sugar and Tobacco Between Canada and the United States, 1986 Base Year

Region	Commodity	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
		---------- percentage change ----------						
Canada								
	Cotton	.22	.22	.11	.02	-.03	-.03	IM
	Sugar	.03	.01	.01	.00	.00	.00	IM
	Tobacco	.00	.00	.00	.00	.00	.00	EX
U.S.[b]								
	Cotton	.22	.13	.11	.30	-.02	.45	EX
	Sugar	.03	.00	.00	.00	.13	.29	IM
	Tobacco	.00	.00	.00	.00	.00	.00	IM
Southeast								
	Cotton	.22	.13	.11	-.01	-.02	-.01	EX
	Sugar	.03	.00	.00	.52	-1.58	3.54	EX
	Tobacco	.00	.00	.00	.00	.00	.00	EX
Rest-of-World								
	Cotton	.22	.22	.11	-.05	-.01	.35	IM
	Sugar	.03	.03	.01	-.03	.00	-1.04	EX
	Tobacco	.00	.00	.00	.00	.00	.09	IM

a) Action indicates the trade situation for each commodity in each region, such as imports (IM) and exports (EX).
b) The U.S. region is the rest of the United States excluding 10 southeastern states.

Table 7. Impact of Tariff Removal on Potatoes Between Canada and the United States, 1986 Base Year

Region	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
	---------- percentage change ----------						
Canada	.02	.02	.01	.00	.00	.59	EX
U.S.[b]	.02	.03	.00	.00	.00	.08	EX
Southeast	.02	-3.24	-1.56	-.98	1.26	1.78	IM
Rest-of-World	.02	.02	.02	.00	-.01	-2346.07[c]	IM

a) Action indicates the trade situation for each commodity in each region, such as imports(IM) and exports(EX).
b) The U.S. region is the rest of the United States excluding 10 southeastern states.
c) The decreasing imports by 2346% makes the Rest-of-World region become an exporting region rather than an importing region.

Table 8. Impact of Tariff Removal on Fresh Strawberries Between Canada and the United States, 1986 Base Year

Region	World Price	Producer Price	Consumer Price	Supply	Demand	Trade	Action[a]
	---------- percentage change ----------						
Canada	.36	-11.54	-9.64	-3.61	7.79	43.14	IM
U.S.[b]	.36	.25	.12	.08	-.09	2.70	EX
Southeast	.36	-1.13	-.43	-.34	.35	1.28	IM
Rest-of-World	.36	.37	.36	.11	-.17	18.37	EX

a) Action indicates the trade situation for each commodity in each region, such as imports(IM) and exports(EX).
b) The U.S. region is the rest of the United States excluding 10 southeastern states.

Table 9. Changes in the Value of Net Agricultural Trade as a Result of the Canada-U.S. Free Trade Agreement, 1986 Base Year

Region	Before the Agreement	After the Agreement	Difference
	---------- Million ----------		
Canada	4,168.24	4,121.64	-46.60
US	10,843.99	10,382.98	-461.01
Southeast	-1,610.02	-1,639.73	-29.71

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