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The Effects of the Canadian-United States Free Trade Agreement on Bilateral Trade Flows of Agricultural and Industrial Products

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The Effects of the Canadian-United States Free Trade Agreement on Bilateral Trade Flows of Agricultural and Industrial Products

Introduction

Over the ten-year period beginning January 1, 1989, most remaining trade barriers between Canada and the United States will be eliminated as a result of the Canadian-United States Free Trade Agreement (FTA)[1]. The consequences of the FTA for economic interests in the United States, Canada, and the rest of the world raises many questions. Due to trade creation and diversion effects, the FTA is expected to affect not only the bilateral trade relationship between the two countries but also trade relations with third-party countries as well. A lowering of bilateral import prices relative to those of the rest of the world, as a consequence of the FTA, should create more trade between the two countries. A trade diversion effect would occur when U.S. exports to Canada and Canadian exports to the United States displace goods from other countries that continue to face tariff and non-tariff barriers (NTB) in the North American market.

Although the FTA contains a large number of measures for reducing the impediments to trade (from tariff removal to a dispute-settlement mechanism for dealing with issues such as countervailing duties), tariff rates are the most common barrier between the two countries. The average ad valorem equivalent nominal tariff rate imposed by Canada on agricultural goods in 1987 was about 3.0 percent compared to about 5.2 percent for industrial goods. The corresponding rates imposed by the United States were 2.0 and 3.2, respectively (see Figure 1). Tariffs, which constitute the most important type of trade restrictions between the two countries, were estimated in 1987 to account for about 75 percent and 60 percent of the total price protection applied by Canada and United States, respectively. Quantitative restrictions (primarily quotas) account for a further 25

percent and 35 percent.[2] Preferential federal non-defense procurement of goods is estimated to have minimal effect on the average rate of price protection for both countries (Canadian Department of Finance). The primary objective of this paper is to evaluate bilateral trade flows of agricultural and industrial products between the United States and Canada with special emphasis to empirical evaluation of the FTA on the trade flow between the two countries and impacts on trade flows with third-party countries. This paper will concentrate upon examining the potential impact of removal of tariffs. In addition, trade in automobiles and auto parts is excluded from this analysis since these goods are part of a two-way tariff-free exchange that has existed since 1965 under the Auto Pact.[3]

Although there are many studies which have evaluated trade relationships between countries, studies by Appelbaum and Kohli (1979), Murray and Ginman (1976), Harris and Cox (1984), Stokes (1989), Blandford and Sorenson (1987), and Wigle (1986) have focused on bilateral trade flows between the United States and Canada.

The Model

The static version of the traditional log-linear bilateral trade model, assuming no trade barriers, is specified as follows:

$$(1)\quad \log Q_{mt} = \beta_1 + \beta_2 \log P_{mt} + \beta_3 \log DP_{mt} + \beta_4 \log WP_{mt} + \beta 5 \log Y_t + e_t$$

$$(2)\quad \log Q_{xt} = \alpha_1 + \alpha_2 \log P_{xt} + \alpha_3 \log DP_{xt} + \alpha_4 \log WP_{xt} + \alpha_5 \log C_t + u_t$$

where Q_{mt} (Q_{xt}) is the quantity of a country's imports (exports), P_{mt} (P_{xt}) is the bilateral unit value index of imports (exports), DP_{mt} (DP_{xt}) is the domestic wholesale price index in the importing (exporting) country, WP_{mt} (WP_{xt}) is the multilateral unit value index of imports (exports), Y_t is a measure of national income in the

importing country, C_t is a measure of production capacity in the exporting country, and e_t (u_t) is a random error term in the import (export) equation. Equation 1 represents a country's import demand, while Equation 2 is the export supply of its trading partner. In equilibrium, $Q_{mt} = Q_{xt}$. This specification assumes firms in the exporting country and consumers in the importing country do not influence price.

Equation 2 is known as supply quantity equation. Alternative specification of export supply equation is a supply price relationship in which the bilateral unit value index of exports is specified as a function of quantity of commodities supplied [Haynes and Stone; and Goldstein and Khan]. Haynes and Stone argued in their study on bilateral trade between the United States and the United Kingdom that the supply price relationship is more appropriate than the supply quantity relationship for dynamic trade models. Equation 2 can be rewritten as

(3) $\log P_{xt} = -\alpha_1/\alpha_2 + \log Q_{xt}/\alpha_2 - \alpha_3 \log DP_{xt}/\alpha_2 - \alpha_4 \log WP_t/\alpha_2 - \alpha_5 \log C_t/\alpha_2 + U_t/\alpha_2$

Equations 1 and 3 are static, assuming that all adjustments to equilibrium values of quantity traded and price occur immediately. However, adjustments generally take place with some delay (Goldstein and Khan). To introduce dynamic behavior into Equations 1 and 3, we followed the procedure used by Goldstein and Khan. The dynamic import demand model which incorporates adjustment mechanism (i.e., $\Delta \log Q_t = \gamma \log(Q_{mt}/Q_{t-1})$ is

(4) $\log Q_t = a_1 + a_2 \log P_{mt} + a_3 \log DP_{mt} + a_4 \log WP_{mt} + a_5 \log Y_t + a_6 \log Q_{t-1}$

where $a_1 = \gamma\beta_1$, $a_2 = \gamma\beta_2$, $a_3 = \gamma\beta_3$, $a_4 = \gamma\beta_4$, $a_5 = \gamma\beta_5$, and $a_5 = (1-\gamma)$

In the adjustment equation, Q_t is the actual quantity of commodities traded, γ is the coefficient of adjustment ($0 \leq \gamma \leq 1$) and Δ is the first difference operation, $\Delta \log Q_t = \log Q_t - \log Q_{t-1}$. Actual imports are assumed to adjust to the difference between demand for the commodity imported in t (Q_{mt}) and the actual flows in the previous period (Q_{t-1}). It is expected that $a_2 < 0$, $a_3 > 0$, $a_4, > 0$, $a_5 > 0$ and $a_6 > 0$.

Similarly, the dynamic export supply model which incorporates adjustment mechanism (i.e., $\Delta \log P_{xt} = \lambda \log (Q_t/Q_{xt})$ is

(5) $\log Q_t = - \lambda\alpha_1/A + \lambda \log Q_t/A - \lambda\alpha_3 \log DP_{xt}/A - \lambda\alpha_4 \log WP_{xt}/A - \lambda\alpha_5 \log C_t/A + \lambda \log P_{xt-1}/A + \lambda U_t/A$

where $A = \alpha_2\lambda + 1$.

The relationship between import and export prices can be established under an assumption of no transportation costs as follows:

(6) $P_{xt} = P_{mt}/ER_t$

where ER_t is the exchange rate (the price of the exporting country's currency in terms of the importing country's currency).

Equations 5 and 6 can be combined as follows:

(7) $\log P_{mt} = b_1 + b_2 \log Q_t + b_3 \log DP_{xt} + b_4 \log WP_{xt} + b_5 \log C_t + b_6 \log P_{xt-1} + b_7 \log ER_t + b_8 \log ER_{t-1} + V_t$

where $b_1 = -\lambda\alpha_1/(\alpha_2\lambda + 1)$, $b_2 = \lambda/(\alpha_2\lambda + 1)$, $b_3 = -\lambda\alpha_3/(\alpha_2\lambda + 1)$, $b_4 = \lambda\alpha_4/(\alpha_2\lambda + 1)$, $b_5 = -\lambda\alpha_5/(\alpha_2\lambda + 1)$, $b_6 = 1/(\alpha_2\lambda + 1)$, $b_7 = 1.0$, $b_8 = -1/(\alpha_2\lambda + 1)$.

Equations 4 and 7 are a dynamic system of the bilateral trade relationships in which Q_t and P_{mt} are endogenous and other variables are exogenous. This dynamic system is used to quantify the U.S. trade relationship with Canada and the Canadian trade relationship with the United States.

The Data

The United States and Canadian trade data for industrial products were collected quarterly from 1972 to 1985. Bilateral unit value indices for exports and imports were obtained from Statistics Canada. Quarterly values of U.S. exports and imports were obtained from Highlights of U.S. Export and Import Trade (U.S. Department of Commerce). The values were used to derive a quantity index from a method adopted by Kreinin (1967). The multilateral unit value indices for imports and exports, wholesale price indices (used as a proxy of the domestic prices of industrial products), and GNP were obtained from International Financial Statistics.

Results

The conceptual models, specified in Equations 4 and 7, of the U.S. import demand from Canada and the Canadian export supply to the United States were estimated simultaneously by using the three-stage least-square estimator (3SLS). Similarly, models for Canadian import demand from the United States and U.S. export supply to Canada were also estimated by using the 3SLS estimator. At the preliminary stage of the analysis, the coefficients for the quantity and capacity variables in the export supply equations were small in magnitude and statistically insignificant.[4] WP_{mt} and ER_{t-1} were highly correlated with P_{mt} and ER_t, respectively. Thus, the model was re-estimated after dropping these variables for the supply and demand equations. On the other hand, quarterly dummy variables were added to Equations 4 and 7 to capture seasonality presented in the data.

The estimated parameters of the bilateral trade flow models for agricultural and industrial products are presented in Tables 2 and 3. All equations have high R^2s, ranging from 0.78 to 0.99, indicating that the explanatory variables specified in the models explain most of

the causes of variations in the values of the dependent variables. All the estimated parameters have the signs as hypothesized.[5] Particularly, the estimated coefficients for the lagged dependent variable in all equations differ significantly from zero at the 5 percent level, indicating that the bilateral trade relationship through import demand and export supply between the two countries is subject to the dynamic adjustments hypothesized in equations 4 and 7.

i) Interaction of U.S. import demand and Canadian export supply

As shown in Table 2, the estimated U.S. import demand elasticities[6] with respect to import price (P_{mt}) and domestic price (DP_{mt}) for industrial goods are -0.90 and 1.04, respectively, indicating that U.S. imports from Canada are relatively more sensitive to domestic prices in the United States than to import prices. This is a reflection of the popular view that Canadian exports to the United States neither dictate price in the U.S. market nor can be classified as perfect substitutes for comparable goods made in the United States. The magnitude of income elasticities (0.60 and 0.26) illustrates that U.S. import demand for industrial goods are relatively more sensitive to income changes than agricultural products. The estimated income elasticities, however, is rather low (inelastic) because U.S. imports from Canada are a relatively high proportion of raw materials, including energy and lumbers.[7]

The dependent variable of the Canadian export supply equation is import prices (P_{mt}) in the U.S. market instead of quantity of imports. Therefore, the estimated coefficients shown on the right side of the equation, such as domestic prices (DP_{xt}), world prices (WP_t), and exchange rates (ER_t), all are interpreted as transmission elasticities.[8] Transmission coefficients for world prices and exchange rates are statistically significant at the 5 percent level

while the coefficients in regard to the domestic price (DP_{xt}) of both industrial and agricultural goods are not significant. These findings indicate that import prices in the United States are largely influenced by world prices and exchange rates but not by domestic prices in Canada. The exchange rate coefficients for both agricultural and industrial products have negative signs in the Canadian export supply equation since exchange rates are expressed as the Canadian dollars per unit of the U.S. dollars. Appreciation of the U.S. currency, therefore, will raise the magnitude of ER_t, ceteris paribus, and subsequently reduce the prices of imported goods into the United States, leading to increased U.S. imports.

As shown in Table 2, the transmission elasticity with respect to the exchange rate differs between industrial products (greater than 1) and agricultural goods (smaller than 1). This indicates that exchange rate swings will be transmitted fully to the import prices of industrial goods obtained from Canada but not to the import prices of agricultural goods--at least in the short run. However, the transmission elasticity with respect to world prices is inelastic in the case of both industrial products and agricultural goods (i.e., 0.66 for industrial goods and 0.62 for agricultural products) implying that any changes in world prices will be transmitted less than fully to import prices.

By using the estimated transmission elasticities, the import demand elasticity with respect to the domestic price in the exporting country (DP_{xt}), world price (WP_t), and exchange rate (ER_t) can be derived.[9] The estimated import demand elasticity with respect to the domestic price in the exporting country (DP_{xt}), world price (WP_t), and exchange rate (ER_t) for industrial goods are -0.01, -0.59, and 1.32, respectively. Similarly, import demand elasticities with respect to

DP_{xt}, WP_t, and ER_t for agricultural products are -0.08, -0.98, and 0.44, respectively. These indicate that through the transmission mechanism, U.S. imports from Canada for both industrial and agricultural goods are influenced more by world prices and exchange rate variations than by the variation of domestic prices in Canada.

ii) Interaction of Canadian import demand and U.S. export supply

For Canada, import and domestic price elasticities of demand for industrial goods are -0.63 and 0.71, respectively, which are smaller magnitudes than those in the U.S. import demand equation (see Table 3). This is perhaps because Canadian consumers have less domestic substitutes than their U.S. counterparts. The Canadian economy has a much smaller internal market and a less competitive environment than the United States. On the other hand, the income elasticity in the Canadian import demand equation is 0.76 which is somewhat larger than that for the United States. This is probably because a higher proportion of Canadian imports from the United States are technologically oriented consumer goods, which are more sensitive to the national income level.

Canadian import demand for agricultural products, however, appears to be largely unaffected by key economic variables such as P_{mt}, DP_{mt}, and Y_t as the analysis shows these to be statistically insignificant. This finding suggests that Canadian imports of agricultural products are determined by considerations other than the market forces manifested by price mechanism.[10] Institutional factors, such as the existence of supply management programs and government intervention (e.g., import license requirements), appear to play an important role in determining the flow of imports of agricultural commodities.

In the U.S. export supply equation, the estimated coefficients in regard to the domestic price variable (DP_{xt}) for both industrial and agricultural products differ significantly from zero at the 5 percent level; and the transmission elasticities are 0.29 and 0.16, respectively, much larger than those in the Canadian export supply equation shown in Table 2. This implies that Canadian import prices of commodities originating in the United States are relatively more sensitive to U.S. domestic prices, mainly because of Canada's relatively greater dependency on the U.S. economy. The transmission elasticity with respect to the Canadian multilateral unit value index (WP_t) for industrial goods is 0.18, which is relatively smaller than that in the Canadian export supply equation in Table 2, probably because Canada imports more from the United States than from the rest of the world.

Since exchange rates are expressed as the Canadian dollars per unit of the U.S. dollars, the exchange rates in the U.S. export supply equation have a positive sign. Appreciation of U.S. dollars against Canadian dollars raises ER_t and increases Canadian import prices (P_{mt}), which reduces the Canadian imports (Q_{mt}). The transmission elasticity of industrial goods with respect to the exchange rate is 0.70 in the U.S. export supply equation, implying that changes in exchange rates are not transmitted fully to the Canadian import prices in the short run. The long-run transmission elasticity, however, is 1.18[11], indicating that exchange rates are fully transmitted to the import prices in the long run.

The Canadian import demand elasticities for industrial goods, with respect to domestic prices in the United States (DP_{xt}), world prices (WP_t), and exchange rates (ER_t), are -0.18, -0.11, and -0.44,

respectively. Thus, Canadian imports are more sensitive to exchange rates than to U.S. domestic prices and world prices.

Finally, using dummy variables shown in Tables 2 and 3, the seasonality of the United States-Canadian bilateral trade flow was tested.[12] The test rejects the null hypothesis that the set of dummy variables are equal to zero, indicating that trade is seasonal in nature.

Effects of the FTA on Trade Flows

When tariff protection is eliminated completely under the FTA in 1998 while tariff protection from the third party countries remain at the same level as prior to the FTA, trade volume between the two countries would be increased through trade creation and diversion effects.

Trade creation effects will occur when trade volume between the two trading partners is increased as a result of the displacement of domestic production while trade diversion effects will occur when increases in the trade volume displace imports from the third-party countries (assuming that tariffs on the goods of these countries remain at pre-FTA levels). By following Baldwin and Murray[13], the trade creation and diversion effects of the FTA are calculated as follows:

$$(7) \quad TC_i = M_i e_i \, (\Delta t_i / (1+t_i))$$

$$(8) \quad TD_i = TC_i \, (M_{Ni} / V_i)$$

$$(9) \quad TE_i = TC_i + TD_i$$

where

TC_i = trade creation effects in country i

TD_i = trade diversion effects in country i

TE_i = trade expansion effects in country i

M_i = initial level of imports in country i

e_i = import demand elasticity in country i

Δt_i = changes in tariffs in country i

t_i = initial level of tariffs in country i

M_{Ni} = import from non-beneficiary sources trading with country i

V_i = total domestic production in country i

Based on trade flows (1987), tariffs (1987) and the estimated import demand elasticities, U.S. imports of agricultural products from Canada could increase by an estimated $168 million, of which $144 million may be attributed to trade creation effects and $24 million to trade diversion effects (see Table 4)[14]. The comparable estimates for industrial goods yield a total of $2,170 million, with trade creation effects accounting for $1,982 million and trade diversion effects for $188 million. For Canada imports of agricultural products could increase by $16, while imports of industrial products could increase by $1,411 million. The additional Canadian imports are smaller in absolute magnitude than those in the United States mainly because Canadian import demands are relatively more inelastic than those of the United States. So price reductions as a result of removing tariffs would have a smaller effect even though Canadian tariffs were relatively higher than that of the U.S. The overall impact of the FTA on the third countries trading with the U.S. and Canada is approximately $318 million reduction as shown in Table 4.

The income effect of the FTA on the bilateral trade volume depends upon the magnitude of the income growth arising from the FTA. An assessment of the net income generation out of the FTA is beyond the scope of this partial equilibrium approach. However, the effects of income growth on bilateral trade volume can be evaluated using estimated income elasticity. Since the income elasticity for

industrial goods has a somewhat higher magnitude (i.e., 0.76) in Canada than in the United States (i.e., 0.60), it is expected that Canada would import proportionately more of these goods from the United States than the reverse order, assuming income increases by the same percentage in each country.

This implies that producers in the United States should get more benefit from the FTA than producers in Canada because expected increases in Canadian imports of industrial goods are higher than in the case of U.S. imports from Canada, arising from income effects of the FTA. Consumers in Canada, on the other hand, should benefit more from the elimination of the nominal tariffs under the FTA than consumers in the United States because, historically, Canada has maintained relatively higher tariff protection than the United States.

The above analysis is based on the assumption of exchange rate neutrality. However, if exchange rate swings occur during the tariff elimination period (1989-1998), the effects of exchange rate changes may reinforce or counter the effects of the FTA. If the U.S. dollar depreciates 10 percent against the Canadian dollar during the FTA era, U.S. import demand for industrial goods from Canada would be decreased by an 13.2 percent, which substantially outweighs increases in imports attributable to the FTA. On the other hand, should the U.S. dollar depreciate about 10 percent, in addition to the expected increases in imports attributable to the FTA, Canadian import demand would increase for about 4 percent.

Concluding Remarks

Although both the United States and Canada have similar economic conditions and heritage, their bilateral trade structures between the two countries differ significantly from each other. Furthermore, the

trade relationships with third countries differs substantially between the two trading partners. Among other factors, such differences are a reflection of differences in resource endowments and market size.

This study found that U.S. import demand for Canadian goods is more sensitive, not only to import prices and domestic prices, but also to world prices, than Canadian import demand for U.S. goods. If the exchange rate neutrality is assumed, the expected increases in U.S. imports of both agricultural and industrial goods from Canada greatly exceed the expected increases in the Canadian imports of U.S. products. In explanation, it should be borne in mind that the United States has a relatively large internal market compared to Canada and a greater domestic availability of import substitutes. In addition, the bilateral trade relationship between the two countries with respect to agricultural commodities differs significantly from that for industrial goods. Consequently, the elimination of all tariffs under the FTA will differ in its impact on the economy of each country.

The effects on bilateral trade flows of the elimination of all tariffs would increase the interchange of agricultural and industrial goods between the two countries, primarily through trade creation and diversion effects. However, the trade diversionary effects of the FTA on the third country trade are found to be small in magnitude.

Notes

1. In January of 1988, the United States and Canada signed a Free Trade Agreement, later ratified by the U.S. Senate, as well as the Canadian Parliament.

2. Note that the estimates of quantitative restrictions are expressed in terms of ad valorem tariff equivalents.

3. The Automotive Products Trade Agreement (APTA) between Canada and the United States, often referred to as the Auto Pact, was completed in January 1965. The agreement stipulated that automotive products for use as original equipment be permitted duty-free movement across the United States-Canadian border. This has led to the creation of an integrated North American automotive marketing and industrial sector.

4. When a perfectly elastic export supply curve prevails in the market, quantity of supply changes without changing supply price. Similarly, when excess production capacity exists in the exporting country, firms in exporting countries can supply more goods without increasing prices.

5. In addition, "t" values of the estimated parameters are in most cases statistically significant at the 5 percent level.

6. Note that since the coefficients are estimated from the log-log function, the estimated coefficients are by definition elasticities.

7. In 1988, raw materials exported by Canada to the United States constituted about 14 percent of Canada's total exports to the United States, including automobiles and auto parts. Raw materials exported by the United States to Canada accounted for about 8 percent of total shipment.

8. For details see Bredahl, M.E., W.H. Meyers, and K.J. Collins.

9. For example, the import demand elasticity with respect to the domestic price in the exporting country ($\partial \log Q_{mt} / \partial \log DP_{xt}$) is a product of the import demand elasticity with respect to the import price ($\partial \log Q_{mt} / \partial \log P_{mt}$) and transmission elasticity of the import price with respect to the domestic price in the exporting country ($\partial \log P_{mt} / \partial \log DP_{xt}$).

10. As is the case with most industrialized countries, the United States and Canada support and protect their agricultural sectors through subsidy payments and a variety of market intervention measures such as quotas, import licenses, and phytosanitary regulations. These barriers loom large in relation to agriculture's relatively small share of the total bilateral trade between the two countries. Imports of agricultural products, including live animals, and food, feed, beverages and tobaccos, constituted less than 5 percent of Canadian total imports from United States in 1988.

11. The t-test accept the null hypothesis that the long-run elasticity is equal to 1.0 at the 5 percent significance level.

12. Sum of the squared residuals from unrestricted model from unrestricted model (coefficients of the seasonal dummy variables are not equal to zero) and restricted model (the coefficients are zero) are compared by using the F-statistics.

13. The Baldwin and Murray model assumes the following: (1) imports from beneficiary and non-beneficiary countries are imperfect substitutes, (2) imports from both beneficiary and non-beneficiary countries are imperfect substitutes for the domestic production of the preference granting country, (3) supply curves are perfectly elastic, etc.

14. For details of methodology, see paper by Baldwin and Murray (1977). It should be noted that the import price data (P_{mt}) used in this study are CIF price plus duty paid. Under the perfectly elastic supply function assumed by Baldwin and Murry, therefore, tariff reductions on bilateral trade will be fully reflected to import price.

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TABLE 1. COMPARISON OF CANADIAN AND U.S. TARIFF BARRIER (BILATERAL PERSPECTIVES) FOR SELECTED INDUSTRIES AND ALL INDUSTRIES (AGGREGATED)

Industry	Tariff Barrier	
	Canada	U.S.
Agriculture	3.0	2.0
Forestry	0.0	0.2
Fishing and Trapping	0.2	1.7
Mining	0.2	0.4
Manufacturing (aggregate)	5.2	3.2
Food and beverage	5.2	3.6
Tobacco	16.5	20.7
Leather	15.7	7.5
Textiles	11.4	8.5
Knitting mills	22.7	12.3
Clothing	19.7	10.9
Furniture and fixtures	12.5	2.0
Shipbuilding	10.1	0.3
Goods-production (aggregate)	4.5	2.8

Note: the tariff estimates presented in Table 1 were derived using production data as aggregation weights.

SOURCE: Finance Canada, Trade Barriers Between Canada and the United States, Working Paper No. 88-3, Ottawa, 1988, p. 10.

TABLE 2. 3 SLS ESTIMATES OF U.S. IMPORT DEMAND AND CANADIAN EXPORT SUPPLY EQUATIONS[a]

Dependent Variables and Products:	Independent Variables and Corresponding Coefficients									R^2	N
1. U.S. import demand equation	C^b	P_{mt}	Y_t	DP_{mt}	Q_{t-1}	D_1	D_2	D_3	D_{81}		
Industrial Commodities (Qmt)	-0.15 (-0.19)	-0.90 (-3.99)	0.60 (2.45)	1.04 (3.89)	0.38 (2.95)	-0.07 (-1.87)	0.03 (0.92)	-0.17 (-4.82)	-0.08 (-1.85)	0.89	55
Agricultural Products (Q_{mt})	0.14 (0.07)	-1.57 (-2.52)	0.26 (0.79)	1.96 (2.84)	0.42 (2.77)	0.17 (2.24)	-0.10 (-2.49)	-0.07 (-1.75)	-0.11 (-2.33)	0.94	55
2. Canadian export supply equation	C	DP_{xt}	ERt	WP_t	P_{mt-1}	D_1	D_2	D_3	D_{73}		
Industrial commodities (P_{mt})	0.22 (2.26)	0.01 (0.14)	-1.47 (-9.52)	0.66 (7.67)	0.46 (8.17)	0.03 (3.55)	-0.02 (-2.44)	-0.01 (-1.11)		0.99	55
Agricultural products (P_{mt})	0.69 (2.18)	0.05 (0.40)	-0.28 (-1.23)	0.62 (4.68)	0.18 (1.61)	0.03 (2.29)	0.05 (3.19)	0.05 (3.55)	0.04 (1.70)	0.98	55

[a]Figures with parenthesis underneath the coefficients are "t" values.
[b]Constant term.

TABLE 3. 3 SLS ESTIMATES OF CANADIAN IMPORT DEMAND AND U.S. EXPORT SUPPLY EQUATIONS[a]

Dependent Variables and Products:	Independent Variables and Corresponding Coefficients										R^2	N
1. Canadian import demand equation	C^b	P_{mt}	Yt	DP_{mt}	Q_{t-1}	D_1	D_2	D_3	D_{73}	TR		
Industrial Commodities (Q_{mt})	-0.93 (-1.06)	-0.63 (-3.02)	0.76 (3.64)	0.72 (3.06)	0.44 (4.11)	-0.02 (-0.93)	0.07 (2.91)	-0.15 (-5.28)	(-2.27)	-0.03	0.90	55
Agricultural Products (Q_{mt})	1.22 (0.68)	-0.21 (-0.83)	0.27 (0.79)	0.29 (0.62)	0.63 (6.10)	-0.22 (-4.45)	0.05 (1.04)	-0.19 (-4.36)	-0.06 (-0.93)		0.78	55
2. U.S. export supply equation	C	DP_{xt}	ERt	WP_t	P_{mt-1}	D_1	D_2	D_3	D_{73}			
Industrial commodities (P_{mt})	0.87 (6.02)	0.29 (2.88)	0.70 (6.33)	0.18 (4.43)	0.43 (5.24)	-0.01 (-1.27)	0.01 (1.56)	0.00 (0.26)			0.99	55
Agricultural products (P_{mt})	0.09 (0.29)	0.16 (3.10)	0.16 (0.61)	0.05 (0.70)	0.76 (6.33)	0.13 (7.05)	0.02 (1.32)	0.06 (3.52	0.02 (0.65)		0.98	55

[a]Figures with parenthesis underneath the coefficients are "t" values.
[b]Constant term.

TABLE 4. ESTIMATED TRADE EXPANSION EFFECTS[a] OF THE FTA ($ CANADIAN MILLION)

Item	Agricultural Products	Industrial Products	Total
1. Effects on bilateral trade:			
US. Imports from Canada			
Trade creation	$144.1	$1,982.4	$2,125.2
Trade diversion	23.7	187.8	211.5
Trade expansion	$167.8	$2,170.2	$2,336.7
Canadian Imports from U.S.			
Trade creation	$11.4	$1,273.8	$1,285.2
Trade diversion	4.3	136.7	141.0
Trade expansion	$15.7	$1,410.6	$1,406.0
2. Effects on third party country			
U.S. imports from third party	-23.7	-187.8	-211.5
Canadian imports from third party	-4.3	-136.7	-106.2
Total reduction of imports from North America	-28.0	-324.5	-317.8
Percentage of total import	-0.001	ns	ns

[a]The estimated trade expansion effects of the FTA are derived from the 1987 actual trade volume.
ns = negligibly small percentage.