"THE REGIONAL CONSEQUENCES OF THE CANADIAN TARIFF STRUCTURE"

by

Tim Hazledine

Economic Council of Canada

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Preliminary, and not to be quoted without the author's permission.

I Introduction

The work reported in this paper is drawn from a larger study being undertaken by the author for the Economic Council of Canada under the rubric "The Costs and Benefits of the Canadian Federal Customs Union". In considering some conceivable alternatives to the present Federal system, my focus is limited to predicting their implications for production and trade through changes in the commercial relations (tariff structure) between the regions and with the rest of the world.[1]

The empirical base for this study is a set of data assembled for the year 1974 giving industrially disaggregated production, consumption and trade flows for each of five regions of Canada (Atlantic, Quebec, Ontario, Prairies, British Columbia).

On this database is built a simple model in which changes in economic flows are functions of changes in tariffs, wage rates and exchange rates. The model is used to calculate, for a given change in a region's commercial policy, the adjustments in wages and exchange rates needed to maintain employment and the balance of trade at given levels.

For reasons of space we here consider only one alternative ('Option 1') to the present federal system. In Option 1, it is assumed that each region retains the present Canadian

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1 Within such an approach, the relatively mild form of separation that would retain monetary union and free interregional trade, has no effect.

tariff structure and imposes it on the other regions. While not in itself a very likely event, Option 1 does allow us to assess how regional patterns of economic activity are affected by the Canadian customs union.

In this paper we will examine production and employment effects, but not consumption changes, so that no assessment will be made of the economic welfare consequences of Canada for its constituent regions.

II Changes in Production, Shipments, and Employment

1 We disaggregate each region's shipment flows in each industry into five categories:

S_D -- 'domestic' shipments (goods produced and consumed within the region);

S_{RX} -- 'regional exports' (goods produced within the region and shipped to other Canadian regions);

S_{WX} -- 'foreign exports' (within-region production shipped to other countries);

S_{RM} -- 'regional imports' (shipped into the region from other regions);

S_{WM} -- 'foreign imports' (shipped into the region from other countries).

2 Shipments in each of the domestic categories (S_D, S_{RM}, S_{WM}) are determined by demand, which is a function, for each category, of the prices of all three. Making

use of the definition of elasticity of y with respect to a change in X

$$\varepsilon_Y^X = \frac{dY}{dX} \cdot \frac{X}{Y}$$

We have

$$\dot{Y} = \frac{dY}{Y} = \varepsilon_Y^X \dot{X} \qquad (1)$$

Where the 'dot' superscript denotes a variable in rate of change form. Then the formulae for changes in each of the domestic shipment flows (at base period prices) are:

$$\dot{S}_D = \varepsilon_{SD}^P \dot{P}_D + \varepsilon_{SD,RM}^D \dot{P}_{RM} + \varepsilon_{SD,WM}^P \dot{P}_{WM} \qquad (2)$$

$$\dot{S}_{RM} = \varepsilon_{SRM}^P \dot{P}_{RM} + \varepsilon_{RM,D}^P \dot{P}_D + \varepsilon_{SRM,WM}^P \dot{P}_{WM} \qquad (3)$$

$$\dot{S}_{WM} = \varepsilon_{SWM}^P \dot{P}_{WM} + \varepsilon_{SWM,D}^P \dot{P}_D + \varepsilon_{SWM,RM}^P \dot{P}_{RM} \qquad (4)$$

where, for example, ε_{SD}^P is the own-price elasticity of S_D with respect to P_D, and $\varepsilon_{SD,RM}^P$ is the cross-price elasticity of S_D with respect to P_{RM}. In these and subsequent equations, we will ignore any inaccuracies (non-linearities) that may be introduced by using the infinitesimal calculus in situations involving non-infinitesimal changes in variables.

3 Changes in shipments to other regions -- S_{RX} -- are more complicated. Under Option 1, the price received by a region's shippers (P_{RX}^S-the 'supply price') will fall as the tariff is imposed on interregional trade. We assume that the price fall wipes out the highest-

cost operators according to a 'capacity elasticity' ε^{P}_{QRX} defined as the proportion of base-period shipments produced by the operators who would go out of business for the given price change.

As well, there will be a change in the price paid (P^{d}_{RX}) in other regions with the imposition of the tariff, which will affect sales of the surviving capacity. Thus we have

$$\dot{S}_{RX} = \varepsilon^{P}_{QRX}(\dot{P}^{S}_{RX} - \dot{C}_{RX}) + \varepsilon^{P}_{SRX}\,\dot{P}^{d}_{RX} \qquad (5)$$

where $\dot{C}_{RX}$ is the proportional change in costs that may result from adjustments to the tariff change.

Analogously, for foreign shipments

$$\dot{S}_{WX} = \varepsilon^{P}_{QWX}(\dot{P}_{WX} - \dot{C}_{WX}) + \varepsilon^{P}_{SWX}\,\dot{P}_{WX} \qquad (6)$$

Changes in employment are calculated from changes in shipments on the assumption that average employment/shipments ratios of surviving capacity are constant. We have employment elasticity estimates that give employment/shipment ratios for the highest-cost plants, so that the employment effects of any reductions in an industry's capacity can be calculated.

III Elasticities and Changes in Prices and Costs

To solve equations (2) to (6) for each industry, we have to specify values for the parameters (elasticities), and explain how changes in the tariff structure and other policy

adjustments affect prices and costs.

1 Elasticities

We have estimates, from various sources, of Canadian export, import, and domestic consumption price elasticities. It will be assumed that these estimates can be used as regional elasticities (implying, in particular, that $\varepsilon^P_{SD} = \varepsilon^P_{SRM} = \varepsilon^P_{SRX}$). Cross-price elasticities are computed according to a heuristic formula

$$\varepsilon^P_{ij} = -\varepsilon^P_j \, S_j/S_i \qquad (7),$$

where S_j and S_i are the shipments of j and i.

Capacity and employment elasticities come from distribution functions fitted by Statistics Canada for the author to data on individual establishments in each industry. Establishments were ranked by the ratio of costs to value of output and functions fitted to the distribution of costs and of employment against accumulated shipments.

2 We have assumed that domestic, regional, and foreign sources of supply are differentiated (non-perfect substitutes). This rules out the full-pricing-up-to-the-tariff assumption generally found in studies of effective protection and trade patterns.[1] In a

1 Note that an implication of full-pricing-up-to-the-tariff is that imposing interregional tariffs would have no effect on prices and thus regional trade.

background study[2] I found empirical support for the differentiated product postulate, and estimated a pricing equation which can be expressed

$$P_D = \frac{P_W}{r}(\theta T + C) \qquad (8)$$

where P_D and P_W are the domestic and world prices, r is the exchange rate, θ a markup on the rate of tariff protection, T, and C domestic costs relative to world costs. For the present paper, with given world prices, no changes in tariff rates (apart from extending their coverage), and in which the only source of cost changes will be wage changes, we can derive

$$\dot{P}_D = -\dot{r} + \alpha\dot{W}\gamma \qquad (9)$$

where α is the share of wages in total costs, w denotes the wage rate, and $\gamma = C/(\theta T+C)$. It was estimated that

$$\theta = 5.135 \times (\text{Herfindahl Index of Concentration}) \qquad (10)$$[3]

Regional imports are priced the same as domestic shipments in the base-period, and at the same price as foreign imports under Option 1. Using (8) and

$$P_{WM} = \frac{P_W}{r}(1+T) \qquad (11)$$

we can get

$$\dot{P}_{RM} = \frac{(1+T)}{(\theta T+C)}(1-\dot{r}) - 1 \qquad (12)$$

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2 'Protection; and Prices, Profits and Productivity in Thirty-Three Canadian Manufacturing Industries', Economic Council of Canada Discussion Paper No.110, April, 1978.

3 Herfindahl Index $\equiv \sum^{\wedge} (S_i/S)^2$, where S_i/S is the [illegible]

approximating $1/(1+\dot{r})$ by $(1-\dot{r})$, and given that

$$\dot{P}_{WM} = -\dot{r} \; (= \dot{P}_{WX}) \tag{13}$$

The price paid for regional shipments, P^d_{RX}, changes from the domestic to the world price plus the tariff, so that

$$\dot{P}^d_{RX} = \frac{(1+T)}{(\Theta T+C)} - 1 \tag{14}$$

The price received, P^S_{RX}, changes from the domestic to the foreign export price, P_{WX}, in domestic currency, so that

$$\dot{P}^S_{RX} = \frac{(1-\dot{r})}{(\theta T+C)} - 1 \tag{15}$$

The only source of cost change here considered is changes in wage rates, which affect all shipments; we assume equally. Thus

$$\dot{C}_D = \dot{C}_{RX} = \dot{C}_{WX} = \alpha \dot{W} \tag{16}$$

where α is the share wages are of total costs, and $\dot{W}$ is the rate of change of the wage rate.

IV Policy Target Equations

The two policy targets considered here are the balance of external (regional and foreign) trade, and the level of employment. We will see that the equations of Section III imply equations for each of these targets that are linear functions of the region's exchange rate and wage level -- two policy instruments. Thus the equations can be simply rearranged to show the levels at which the two instruments must be set to achieve any pair of policy targets.

The balance of trade is defined as:

$$B^1 = X^1 - M^1 + R^1 \tag{17}$$

where

$$X^1 = (1 + \dot{P}_{WX} + \dot{S}_{WX})S^0_{WX} + (1 + \dot{P}^S_{RX} + \dot{S}_{RX})S^0_{RX} \tag{18}$$

$$M^1 = (1 + \dot{P}_{WM} + \dot{S}_{WM})S^0_{WM} + (1 + \dot{P}_{RM} + \dot{S}_{RM})S^0_{RM} \tag{19}$$

$$R^1 = TM^1 \tag{20}$$

T is the tariff rate on imports and the superscripts 0 and 1 refer to before and after separation. Expanding (17):

$$\begin{aligned} B^1 = {} & (1 + \dot{P}_{WX} + \varepsilon^P_{QWX}\,[\dot{P}_{WX} - \dot{C}_{WX}] \\ & + \varepsilon^P_{SWX}\,\dot{P}_{WX})S^0_{WX} + (1 + \dot{P}_{RX} + \varepsilon^P_{QRX} \\ & [\dot{P}_{RX} - \dot{C}_{RX}] + \varepsilon^P_{SRX}\,\dot{P}_{RX})S^0_{RX} \\ & - (1 - T)(1 + \dot{P}_{WM} \\ & + \varepsilon^P_{SWM}\,\dot{P}_{WM} + \varepsilon^P_{SWM,D}\,\dot{P}_D + \varepsilon^P_{SWM,RM}\,\dot{P}_{RM})S^0_{WM} \\ & - (1 - T)(1 + \dot{P}_{RM} + \varepsilon^P_{SRM}\,\dot{P}_{RM} + \varepsilon^P_{SRM,D}\,\dot{P}_D \\ & + \varepsilon^P_{SRM,WM}\,\dot{P}_{WM})S^0_{RM} \end{aligned} \tag{21}$$

Equation (21) can be rearranged to:

$$\begin{aligned} B^1 = {} & S^0_{WX} + S^0_{RX} - (1 - T)S^0_{WM} - (1 - T)S^0_{RM} \\ & + (1 + \varepsilon^P_{QWX} + \varepsilon^P_{SWX})\dot{P}_{WX}\,S^0_{WX} - \varepsilon^P_{QWX}\,\dot{C}_{WX}\,S^0_{WX} \end{aligned}$$

$$+ (1 + \varepsilon^{P}_{QRX})\dot{P}^{S}_{RX}\, S^{0}_{RX} + \varepsilon^{P}_{SRX}\, \dot{P}^{d}_{RX}\, S^{0}_{RX}$$

$$- \varepsilon^{P}_{QRX}\, \dot{C}_{RX}\, S^{0}_{RX} - (1 - T)(S^{0}_{WM} + \varepsilon^{P}_{SWM}\, S^{0}_{WM}$$

$$+ \varepsilon^{P}_{SRM,WM}\, S^{0}_{RM})\dot{P}_{WM} - (1 - T)(\varepsilon^{P}_{SWM,D}\, S^{0}_{WM} + \varepsilon^{P}_{SRM,D}\, S^{0}_{RM})\dot{P}_{D}$$

$$- (1 - T)(S^{0}_{RM} + \varepsilon^{P}_{SRM}\, S^{0}_{RM} + \varepsilon^{P}_{SWM,RM}\, S^{0}_{WM})\dot{P}_{RM}$$

$$= a_0 + a_1\dot{P}_{WX} - a_2\dot{C}_{WX} + a_3\dot{P}^{S}_{RX} + a_4\dot{P}^{d}_{RX} - a_5\dot{C}_{RX}$$

$$- a_6\dot{P}_{WM} - a_7\dot{P}_{D} - a_8\dot{P}_{RM} \qquad (22)$$

where the a's are the coefficients of each of the price and cost change variables.

Making use of the expression for the P's and C's developed in Section III, we can further develop (22) to:

$$B^{1} = a_0 - a_1\dot{r} - a_2\alpha\dot{W} + a_3\{\frac{(1-\dot{r})}{\theta T+C} - 1\}$$

$$+ a_4\{\frac{1+T}{\theta T+C} - 1\} - a_5\alpha\dot{W}$$

$$- a_6\dot{r} - a_7(\alpha\dot{W}\gamma - \dot{r}) - a_8\{\frac{1+T}{\theta T+C}(1-\dot{r}) - 1\}$$

$$= a_0 + \frac{a_3}{\theta T+C} - a_3 + \frac{a_4(1+T)}{\theta T+C} - a_4 - \frac{a_8(1+T)}{\theta T+C} + a_8$$

$$- (a_2\alpha + a_5\alpha + a_7\alpha\gamma)\dot{W}$$

$$- (a_1 + \frac{a_3}{\theta T+C} + a_6 - a_7 - \frac{a_8(1+T)}{\theta T+C})\dot{r} \qquad (23)$$

For the change in employment, ΔE, we have:

$$\Delta E = \Delta E_D + \Delta E_{WX} + \Delta E_{RX} \qquad (24)$$

Assuming that each plant can expand output at a constant marginal cost gives:

$$\Delta E_D = \dot{S}_D \cdot E^{0}_{D} \qquad (25)$$

$$\Delta E_{WX} = \dot{S}_{WX} \cdot E^0_{WX} \qquad (26)$$

For regional exports there will be a loss in high-cost capacity. We have an estimate of the (total) employment elasticity with respect to changes in (total) capacity at the high-cost margin, ε^Q_E, and we will assume that this elasticity holds for the portion of capacity involved in interregional shipments. Then:

$$\begin{aligned}\Delta E_{RX} &= \varepsilon^Q_E \, \dot{Q}_{RX} \, E^0_{RX} + \varepsilon^P_{SRX} \, \dot{P}^d_{RX}\delta \\ &= \varepsilon^Q_E \, \varepsilon^P_{QRX}(\dot{P}^S_{RX} - \dot{C}_{RX})E^0_{RX} + \varepsilon^P_{SRX} \, \dot{P}^d_{RX}\delta \qquad (27)\end{aligned}$$

making use of (5); where

$$\delta = E^0_{RX}(1 + \varepsilon^Q_E \, \dot{Q}_{RX}) \qquad (28)$$

-- the base-period employment in the capacity that survives imposition of the interregional tariff. The total change in employment is thus found by summing (25), (26), and (27).

From (2) and (6) we have:

$$\begin{aligned}\Delta E = {} & (\varepsilon^P_{SD} \, P_D + \varepsilon^P_{SD,RM} \, \dot{P}_{RM} + \varepsilon^D_{SD,WM} \, \dot{P}_{WM})E^0_D \\ & + \varepsilon^P_{QWX}(\dot{P}_{WX} - \dot{C}_{WX})E^0_{WX} + \varepsilon^P_{SWX} \, \dot{P}_{WX} \, E^0_{WX} \\ & + \varepsilon^Q_E \, \varepsilon^P_{QRX}(\dot{P}^S_{RX} - \dot{C}_{RX})E^0_{RX} \\ & + \varepsilon^P_{SRX} \, \dot{P}^d_{RX}(1 + \varepsilon^Q_E \, \varepsilon^P_{QRX}(\dot{P}^S_{RX} - \dot{C}_{RX}))E^0_{RX} \\ = {} & b_1\dot{P}_D + b_2\dot{P}_{RM} + b_3\dot{P}_{WM} + b_4\dot{P}_{WX} - b_5\dot{C}_{WX} \\ & + b_6\dot{P}^S_{RX} - b_7\dot{C}_{RX} + b_8\dot{P}^d_{RX} \qquad (29)\end{aligned}$$

Making use of the expressions in Section III:

$$\begin{aligned}\Delta E = &- b_1 r + b_1 \alpha W \gamma + b_2 \{\frac{(1+T)}{\theta T+C} (1 - r) - 1\} \\ &- b_3 r - b_4 \dot{r} - b_5 \alpha \dot{W} + b_6 \{\frac{(1-\dot{r})}{\theta T+C} - 1\} \\ &- b_7 \alpha \dot{W} + b_8 \{\frac{(1+T)}{(\theta T+C)} - 1\} \\ &= (b_7 + b_2) \frac{(1+T)}{(\theta T+C)} + \frac{b_6}{\theta T+C} - b_2 - b_6 - b_8 \\ &+ (b_1 \alpha \gamma - b_5 \alpha - b_7 \alpha) \dot{W} \\ &+ (- \frac{b_2(1+T)}{(\theta T+C)} - \frac{b_6}{\theta T+C} - b_3 - b_4) \dot{r} \qquad (30)\end{aligned}$$

Equations (23) and (30) will be calculated for each industry, then aggregated to give regional aggregate balance of trade and change in employment equations.

V. Solving the Policy Equations

The Model is solved using 1974 data with each region's economy disaggregated into twenty-eight sectors (listed in the Appendix). For space reasons, only results for Quebec are shown in this paper. Results for other regions are available on request.

Table 1 shows the 1974 (base-period) data, and Table 2 the parameters, for each industry. Table 3 shows the effects of imposing inter-regional tariffs, with no change in Quebec's exchange rate or money wage. The effect is to increase the deficit on total extra-regional shipments by nearly 40%, and to slightly reduce employment. The main reason for these changes is the fall in shipments to other regions of Canada.

Next we consider possible policy adjustments. Equations (23) and (30) computed for and aggregated across all industries, are:

$$B^1 = -1.974\times10^6 - 3.158\times10^6\dot{W} - 1.680\times10^7\,\dot{r} \qquad (31)$$

$$\Delta E = -1.157\times10^4 - 1.212\times10^5\dot{W} - 3.320\times10^5\,\dot{r} \qquad (32)$$

(31) and (32) can be re-arranged to get the policy instruments $\dot{W}$ and $\dot{r}$ as functions of the targets B^1 and E:

$$\dot{r} = -0.179 - 1.228\times10^7\,B^1 + 3.197\times10^{-6}\,\Delta E \qquad (33)$$

$$\dot{W} = 0.337 + 3.366\times10^{-7}\,B^1 - 1.401\times10^{-5}\,\Delta E \qquad (34)$$

(33) and (34) suggest that a target of no-change from 1974, (i.e. $B^1 = -1.14\times10^6$ [4], $\Delta E = 0$) could be achieved by a devaluation of Quebec's currency of 3.9%, coupled with a cut of 4.7% in money wages.

To eliminate completely the imbalance of payments, while maintaining 1974 employment levels, would require much larger adjustments - a devaluation of 17.9% and money wage increases of 33.7%. This money wage increase, by increasing the relative price of non-traded goods (mainly services) which are not affected by world prices, reduces the demand for them, and so frees labour to be employed in the export and import-substituting sectors. This suggests relaxing the 1974 employment constraint. With no changes in money wages, a zero balance of payments could be attained through a devaluation of 11.8%, with employment rising by 27,440. Table 4 shows, industry-by-industry, what happens when a mixed policy - 10% devaluation and 5% wage cut - is followed. This results in a fall in the total payments

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(4) The figure of 1.14 $ billion for the 1974 Quebec deficit on trade was arrived at by adding to net exports the duty paid on the foreign imports.

deficit to $136 million, and an increase in employment of 27,750.

There is not space to analyse these results in any detail. As a final caveat, it should be noted that both the database and the model are still subject to correction and modifications. As well, it may be repeated that no measurement is made here of the changes in economic welfare associated with the various options and policies. This will be attempted in subsequent work.

Appendix: List of Industries

1. Agriculture
2. Forestry
3. Fishing
4. Petroleum and Natural Gas
5. Other inedible Crude materials
6. Food and beverage manufacturing
7. Tobacco and products industries
8. Rubber and plastic products
9. Leather products
10. Textiles
11. Knitting mills
12. Clothing
13. Wood industries
14. Furniture and fixtures
15. Paper and allied
16. Printing, publishing and allied
17. Primary metals
18. Metal fabricating
19. Machinery
20. Transportation equipment
21. Electrical products
22. Non-metallic mineral products
23. Petroleum and coal products
24. Chemicals and products
25. Miscellaneous manufacturing
26. Residual manufacturing industries (none in Quebec)
27. Construction
28. All other industries

TABLE 1: 1976 QUEBEC DATA

	SHIPMENTS	CONSUMPTION	IMPORTS,WORLD (S) WM	IMPORTS,ROC (S) RM	EXPORTS,WORLD (S) WX	EXPORTS,ROC (S) RX	DOM. SHIPMENTS (S)
1	1301295.	1919729.	616636.	[illegible]	0.	0.	0.
2	[illegible]	[illegible]	[illegible]	0.	0.	0.	0.
3	[illegible]	[illegible]	[illegible]	0.	0.	0.	[illegible]
4	27.	799628.	793601.	0.	0.	0.	[illegible]
5	1099773.	621145.	0.	0.	672628.	0.	[illegible]
6	[illegible]	[illegible]	19560.	1157911.	[illegible]	954472.	[illegible]
7	[illegible]	245858.	0.	176686.	1461.	207408.	[illegible]
8	[illegible]	[illegible]	157086.	285463.	34967.	199097.	[illegible]
9	261370.	205745.	20833.	66610.	11053.	132016.	1.2182.
10	[illegible]	1066616.	-0.	298965.	49578.	526714.	[illegible]
11	412295.	275748.	0.	40890.	4727.	172619.	[illegible]
12	1454759.	846818.	-0.	70706.	56259.	630288.	762843.
13	825911.	735435.	114568.	119622.	155139.	169547.	[illegible]
14	505113.	390986.	66459.	67315.	19478.	228423.	[illegible]
15	2615715.	1361172.	0.	302735.	966349.	590929.	[illegible]
16	791645.	721513.	63993.	75005.	29138.	183992.	5765.5.
17	2489405.	1606203.	291056.	436357.	715874.	894741.	[illegible]
18	1524520.	1701626.	443770.	380775.	148838.	491605.	[illegible]
19	618751.	1712106.	1139651.	291579.	149371.	188503.	2775.8.
20	1451156.	4090811.	2939961.	750259.	724785.	325819.	[illegible]
21	1258669.	1722684.	600954.	645231.	152765.	629424.	474644.
22	665921.	675106.	40652.	122829.	48440.	105855.	511117.
23	1721194.	1387273.	68751.	21397.	72505.	351564.	[illegible]
24	1649032.	1528531.	167494.	581578.	136350.	733223.	[illegible]
25	515697.	864450.	449746.	233727.	46668.	288052.	253534.
26	1.	351212.	0.	351211.	0.	0.	0.
27	2621979.	2785847.	163868.	0.	0.	0.	0.
28	17676720.	17373717.	0.	0.	303003.	0.	0.

TABLE 2: CANADIAN INDUSTRY PARAMETERS

	CAPACITY ELASTICITY	EMPLOYMENT ELASTICITY	DOMESTIC DEMAND PRICE ELASTICITY	IMPORT DEMAND PRICE ELASTICITY	EXPORT DEMAND PRICE ELASTICITY	NET RATE OF PROTECTION	DOMESTIC MARKUP ON WORLD PRICE
1	0.667	1.000	-0.50	-0.50	-1.00	0.003	1.000
2	0.667	1.000	-0.50	-0.50	-0.75	-0.003	0.999
3	0.667	1.000	-0.75	-0.50	-1.00	-0.026	1.000
4	0.667	1.000	-0.75	-0.50	-0.50	0.001	1.001
5	0.667	1.000	-0.50	-0.25	-1.00	-0.014	0.986
6	1.321	0.951	-0.50	-0.50	-1.00	0.055	1.025
7	1.447	1.419	-0.50	-0.50	-1.00	0.169	1.260
8	1.042	1.148	-0.75	-1.00	-1.00	0.059	1.021
9	0.567	1.066	-0.75	-1.25	-1.00	0.158	1.046
10	1.062	1.156	-0.75	-1.25	-1.00	0.105	1.067
11	1.196	0.981	-0.75	-1.25	-1.00	0.152	1.024
12	1.062	1.062	-0.75	-1.50	-1.00	0.121	1.010
13	0.706	0.969	-0.75	-1.25	-1.00	0.039	1.006
14	0.690	1.091	-1.00	-1.25	-1.00	0.101	1.010
15	0.755	1.248	-0.75	-1.00	-0.75	0.045	1.013
16	0.641	1.225	-1.00	-1.25	-1.00	0.052	1.009
17	0.702	0.888	-0.50	-0.50	-0.75	0.027	1.044
18	0.563	1.065	-0.75	-0.75	-1.00	0.077	1.019
19	0.846	0.999	-1.00	-1.00	-0.75	0.020	1.005
20	1.052	1.066	-0.75	-0.75	-0.75	0.007	1.005
21	1.031	1.144	-0.75	-1.25	-1.00	0.078	1.051
22	0.913	1.194	-0.75	-1.00	-0.75	0.050	1.039
23	1.748	1.033	-0.75	-0.50	-0.50	0.081	1.070
24	0.840	0.986	-0.75	-1.00	-0.75	0.048	1.022
25	0.997	1.092	-0.75	-1.00	-1.00	0.074	1.037
26	0.667	1.000	0.0	0.0	0.0	0.0	1.000
27	0.667	1.000	-1.00	-1.00	1.00	-0.024	1.000
28	0.667	1.000	-0.75	-0.75	0.50	-0.005	1.000

CAPACITY ELASTICITY: % CHANGE IN DOMESTIC CAPACITY FROM A 1% CHANGE IN PRICE

EMPLOYMENT ELASTICITY: % CHANGE IN EMPLOYMENT FROM A 1% CHANGE IN SHIPMENTS

DOMESTIC DEMAND PRICE ELASTICITY: % CHANGE IN CANADIAN DEMAND FOR DOMESTIC OUTPUT FROM A 1% CHANGE IN DOMESTIC PRICE

IMPORT DEMAND PRICE ELASTICITY: % CHANGE IN CANADIAN DEMAND FOR IMPORTS FROM A 1% CHANGE IN IMPORT PRICE

EXPORT DEMAND PRICE ELASTICITY: % CHANGE IN DEMAND FOR CANADIAN EXPORTS FROM A 1% CHANGE IN CANADIAN EXPORT PRICE

NET RATE OF PROTECTION: EFFECTIVE TARIFF PROTECTING CANADIAN OUTPUT AS A PERCENTAGE OF PRICE

DOMESTIC MARKUP ON WORLD PRICE: 1 + 5.135*HERFINDAHL*NET RATE OF PROTECTION

TABLE 3: QUEBEC RESULTS, MODEL 1.1 (\$000)

(NO POLICY ADJUSTMENTS)

	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS CAPACITY	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS	NET EXTRA-REGIONAL SHIPMENTS, 1974	NET EXTRA-REGIONAL SHIPMENTS, OPTION 1	EMPLOYMENT 1974	EMPLOYMENT OPTION1
1	0.0	-0.001669	-618434.089	-6184[illegible].89	112000.	112000.
2	0.001	0.001633	-235526.189	-2355[illegible].189	16115.	16115.
3	0.0	0.019405	-51922.794	-51922.794	2400.	2400.
4	-0.000	-0.000698	-793601.308	-793601.308	72.	72.
5	0.010	0.009566	672628.136	672[illegible].136	25139.	25139.
6	-0.033	-0.046995	-15713.884	-1[illegible].884	56843.	56843.
7	-0.294	-0.262707	72183.387	-201[illegible].745	5818.	4261.
8	-0.022	-0.049385	-212484.744	-231[illegible].648	13822.	13822.
9	-0.043	-0.123170	56625.317	312[illegible].619	12564.	11306.
10	-0.007	-0.093074	277327.384	192[illegible].967	39044.	27577.
11	-0.028	-0.122152	136455.342	110007.[illegible]11	16026.	15349.
12	-0.010	-0.092723	615941.443	549358.526	67139.	64[illegible].
13	-0.005	-0.028534	90476.069	82078.474	24771.	24698.
14	-0.007	-0.096735	114126.570	86796.319	20051.	19235.
15	-0.010	-0.033529	1254543.364	1224858.343	45267.	45036.
16	-0.006	-0.048786	70131.590	58010.403	25289.	25036.
17	-0.030	-0.021286	883202.193	831545.159	30267.	30032.
18	-0.018	-0.060649	-184106.263	-237212.584	39161.	38634.
19	-0.004	-0.019144	-1093355.271	-1101372.644	17487.	17446.
20	-0.008	-0.007378	-2639655.409	-2643911.028	30006.	29949.
21	-0.050	-0.069054	-463995.388	-548644.920	33692.	32498.
22	-0.033	-0.042225	-9184.982	-18145.460	15545.	15441.
23	-0.114	-0.121877	333920.735	268004.748	3254.	3171.
24	-0.018	-0.037205	120500.739	71254.044	26779.	26646.
25	-0.036	-0.062445	-348753.371	-383242.052	18578.	17969.
26	0.0	0.0	-351211.000	-351211.000	0.	0.
27	0.0	0.023521	-163868.031	-163868.031	47383.	47383.
28	0.0	0.003750	303002.714	303002.714	1682391.	1682391.

TOTAL NET EXPORTS, 1974 = -2180747 (\$000)
TOTAL NET EXPORTS, OPTION 1 = -3018242 (\$000)
TOTAL EMPLOYMENT,1974 = 2427000
TOTAL EMPLOYMENT,OPTION 1 = 2414936

TABLE 4: QUEBEC RESULTS, MODEL 1.1 (\$000)

(AFTER 10% DEVALUATION, 5% CUT IN MONEY WAGE RATE)

	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS CAPACITY	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS	NET EXTRA-REGIONAL SHIPMENTS, 1974	NET EXTRA-REGIONAL SHIPMENTS, OPTION 1	EMPLOYMENT 1974	EMPLOYMENT OPTION1
1	0.088	0.086396	-618434.089	-649355.794	112000.	112000.
2	0.076	0.077102	-235526.18	-247302.489	16115.	16115.
3	0.100	0.119425	-51922.794	-54518.934	2400.	2400.
4	0.068	0.067504	-793601.308	-833281.373	72.	72.
5	0.087	0.086920	672628.136	724000.573	25139.	24776.
6	0.104	0.089895	-15713.884	48266.405	56843.	56770.
7	-0.174	-0.138010	72183.387	13119.266	5818.	5003.
8	0.091	0.063605	-212484.744	-226664.270	13822.	14476.
9	0.063	-0.016957	56625.317	50781.265	12564.	12520.
10	0.044	0.018177	277327.384	284092.553	39044.	38524.
11	0.104	0.010617	136455.342	146994.502	16026.	15749.
12	0.110	0.027721	615941.443	688418.937	67139.	66283.
13	0.073	0.050193	90476.069	99591.297	24771.	24573.
14	0.071	-0.018558	114126.570	113539.774	20051.	19660.
15	0.072	0.048061	1254543.364	1411510.687	45267.	45073.
16	0.069	0.025997	70131.590	75192.128	25289.	24484.
17	0.044	0.052756	883202.193	980035.960	30267.	30067.
18	0.088	0.045558	-184106.263	-210621.127	39161.	39008.
19	0.091	0.075461	-1093355.271	-1125310.412	17487.	16785.
20	0.104	0.104352	-2639655.409	-2699029.034	30006.	31686.
21	0.060	0.041219	-463995.388	-501720.983	33692.	35190.
22	0.066	0.056664	-9184.982	-6869.704	15545.	15235.
23	0.054	0.045729	333920.735	364[illegible].815	3254.	3183.
24	0.071	0.051655	120500.739	153454.717	26779.	27169.
25	0.073	0.046269	-348753.371	-371192.642	18578.	19561.
26	0.067	0.066667	-351211.000	-366352.100	0.	0.
27	0.074	0.097928	-163868.031	-163868.031	47383.	47383.
28	0.090	0.093524	303002.714	375854.550	1682391.	1686422.

TABLE 1: 1976 QUEBEC DATA

	SHIPMENTS	CONSUMPTION	IMPORTS,WORLD (S^0_{WM})	IMPORTS,ROC (S^0_{RM})	EXPORTS,WORLD (S^0_{WX})	EXPORTS,ROC (S^0_{RX})	DOM. SHIPMENTS (S^0_{C})
1	1301295.	1915729.	616434.	0.	0.	0.	0.
2	433527.	669053.	235526.	0.	0.	0.	0.
3	[illegible]	66151.	[illegible]1923.	0.	0.	0.	0.
4	27.	793628.	793601.	0.	0.	0.	[illegible]
5	1095773.	423145.	0.	0.	672628.	0.	[illegible]
6	[illegible]	4415591.	19540.	1157911.	201264.	954672.	[illegible]
7	320046.	245851.	0.	176616.	1461.	207408.	[illegible]
8	[illegible]	684533.	157086.	285463.	34967.	199097.	[illegible]
9	[illegible]	205745.	20833.	66610.	11053.	132016.	[illegible]
10	[illegible]	1066616.	-0.	298965.	49578.	526714.	[illegible]
11	412295.	275745.	0.	40890.	4727.	172619.	[illegible]
12	1454759.	846818.	-0.	70700.	56259.	630388.	762843.
13	825911.	735435.	114568.	115622.	155139.	169547.	[illegible]
14	505113.	390966.	66459.	67315.	19478.	228423.	[illegible]
15	2615715.	1361172.	0.	302735.	966349.	590929.	[illegible]
16	791645.	721513.	63993.	79005.	29138.	183992.	[illegible]
17	2485405.	1606203.	291056.	438357.	715874.	894741.	[illegible]
18	1523520.	1707626.	443770.	380715.	148838.	491605.	[illegible]
19	618751.	1712166.	1139651.	291579.	149371.	188503.	[illegible]
20	1451156.	4090811.	2939961.	750255.	724785.	325819.	[illegible]
21	1258689.	1722684.	600954.	645231.	152765.	629424.	[illegible]
22	665921.	675106.	40652.	122825.	48440.	105855.	[illegible]
23	1721194.	1387273.	68751.	21397.	72505.	351564.	[illegible]
24	1649032.	1528531.	167494.	581578.	136350.	733223.	[illegible]
25	515697.	864450.	449746.	233727.	46668.	288052.	[illegible]
26	1.	351212.	0.	351211.	0.	0.	0.
27	2621979.	2785847.	163868.	0.	0.	0.	0.
28	17676720.	17373717.	0.	0.	303003.	0.	0.

TABLE 2: CANADIAN INDUSTRY PARAMETERS

	CAPACITY ELASTICITY	EMPLOYMENT ELASTICITY	DOMESTIC DEMAND PRICE ELASTICITY	IMPORT DEMAND PRICE ELASTICITY	EXPORT DEMAND PRICE ELASTICITY	NET RATE OF PROTECTION	DOMESTIC MARKUP ON WORLD PRICE
1	0.667	1.000	-0.50	-0.50	-1.00	0.003	1.000
2	0.667	1.000	-0.50	-0.50	-0.75	-0.003	0.999
3	0.667	1.000	-0.75	-0.50	-1.00	-0.026	1.000
4	0.667	1.000	-0.75	-0.50	-0.50	0.001	1.001
5	0.667	1.000	-0.50	-0.25	-1.00	-0.014	0.986
6	1.321	0.951	-0.50	-0.50	-1.00	0.055	1.025
7	1.447	1.419	-0.50	-0.50	-1.00	0.169	1.260
8	1.042	1.148	-0.75	-1.00	-1.00	0.059	1.021
9	0.567	1.066	-0.75	-1.25	-1.00	0.158	1.046
10	1.062	1.156	-0.75	-1.25	-1.00	0.105	1.067
11	1.196	0.981	-0.75	-1.25	-1.00	0.152	1.024
12	1.062	1.062	-0.75	-1.50	-1.00	0.121	1.010
13	0.706	0.969	-0.75	-1.25	-1.00	0.039	1.008
14	0.690	1.091	-1.00	-1.25	-1.00	0.101	1.016
15	0.755	1.248	-0.75	-1.00	-0.75	0.045	1.013
16	0.641	1.225	-1.00	-1.25	-1.00	0.052	1.009
17	0.702	0.886	-0.50	-0.50	-0.75	0.027	1.044
18	0.963	1.065	-0.75	-0.75	-1.00	0.077	1.019
19	0.846	0.999	-1.00	-1.00	-0.75	0.020	1.005
20	1.052	1.066	-0.75	-0.75	-0.75	0.007	1.006
21	1.031	1.144	-0.75	-1.25	-1.00	0.078	1.051
22	0.913	1.194	-0.75	-1.00	-0.75	0.050	1.039
23	1.748	1.033	-0.75	-0.50	-0.50	0.081	1.070
24	0.840	0.986	-0.75	-1.00	-0.75	0.048	1.022
25	0.997	1.092	-0.75	-1.00	-1.00	0.074	1.037
26	0.667	1.000	0.0	0.0	0.0	0.0	1.000
27	0.667	1.000	-1.00	-1.00	1.00	-0.024	1.000
28	0.667	1.000	-0.75	-0.75	0.50	-0.005	1.000

CAPACITY ELASTICITY: % CHANGE IN DOMESTIC CAPACITY FROM A 1% CHANGE IN PRICE

EMPLOYMENT ELASTICITY: % CHANGE IN EMPLOYMENT FROM A 1% CHANGE IN SHIPMENTS

DOMESTIC DEMAND PRICE ELASTICITY: % CHANGE IN CANADIAN DEMAND FOR DOMESTIC OUTPUT FROM A 1% CHANGE IN DOMESTIC PRICE

IMPORT DEMAND PRICE ELASTICITY: % CHANGE IN CANADIAN DEMAND FOR IMPORTS FROM A 1% CHANGE IN IMPORT PRICE

EXPORT DEMAND PRICE ELASTICITY: % CHANGE IN DEMAND FOR CANADIAN EXPORTS FROM A 1% CHANGE IN CANADIAN EXPORT PRICE

NET RATE OF PROTECTION: EFFECTIVE TARIFF PROTECTING CANADIAN OUTPUT AS A PERCENTAGE OF PRICE

DOMESTIC MARKUP ON WORLD PRICE: 1 + 5.1355*HERFINDAHL*NET RATE OF PROTECTION

TABLE 3: QUEBEC RESULTS, MODEL 1.1 ($000)

(NO POLICY ADJUSTMENTS)

	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS CAPACITY	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS	NET EXTRA-REGIONAL SHIPMENTS, 1974	NET EXTRA-REGIONAL SHIPMENTS, OPTION 1	EMPLOYMENT 1974	EMPLOYMENT OPTION1
1	0.0	-0.001669	-618434.089	-618[illegible]	112000.	112000.
2	0.001	0.001633	-235526.189	-235526.180	16115.	16115.
3	0.0	0.019425	-51922.794	-51922.794	2400.	2400.
4	-0.000	-0.000698	-793601.308	-793601.306	72.	72.
5	0.010	0.009568	672628.136	672628.136	25139.	25139.
6	-0.033	-0.046955	-15713.884	-100[illegible].690	56840.	56648.
7	-0.299	-0.262707	72183.387	-20191.745	5818.	[illegible]
8	-0.022	-0.049385	-212484.744	-231955.648	13822.	13597.
9	-0.043	-0.123170	56625.317	31285.619	12564.	11904.
10	-0.067	-0.093074	277327.384	192557.967	39044.	37570.
11	-0.028	-0.122132	136455.342	110007.[illegible]	16026.	15349.
12	-0.010	-0.092723	615941.443	549356.526	67139.	64[illegible]
13	-0.005	-0.028534	90476.069	82078.674	24771.	24698.
14	-0.007	-0.096735	114126.570	86756.319	20051.	19795.
15	-0.010	-0.033529	1254543.364	1224259.343	45367.	45536.
16	-0.006	-0.048786	70131.590	58030.503	25289.	25034.
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23	-0.114	-0.121877	333920.735	268004.748	3254.	3171.
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25	-0.036	-0.062445	-348753.371	-383242.052	18578.	17989.
26	0.0	0.0	-351211.000	-351211.000	0.	0.
27	0.0	0.023521	-163868.031	-163868.031	47383.	47383.
28	0.0	0.003750	303002.714	303002.714	1682391.	1682391.

TOTAL NET EXPORTS, 1974 = -2180747 ($000)
TOTAL NET EXPORTS, OPTION 1 = -3018242 ($000)
TOTAL EMPLOYMENT,1974 = 2427000
TOTAL EMPLOYMENT,OPTION 1 = 2414936

TABLE 4: QUEBEC RESULTS, MODEL 1.1 ($000)

(AFTER 10% DEVALUATION, 5% CUT IN MONEY WAGE RATE)

	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS CAPACITY	PERCENTAGE CHANGE IN REGIONAL SHIPMENTS	NET EXTRA-REGIONAL SHIPMENTS, 1974	NET EXTRA-REGIONAL SHIPMENTS, OPTION 1	EMPLOYMENT 1974	EMPLOYMENT OPTION1
1	0.088	0.086396	-618434.089	-649355.794	112000.	112000.
2	0.076	0.077102	-235526.18	-247202.489	16115.	16115.
3	0.100	0.119425	-51922.794	-54518.934	2400.	2400.
4	0.068	0.067504	-793601.308	-833281.373	72.	72.
5	0.087	0.086920	672628.136	724000.573	25139.	24776.
6	0.104	0.089895	-15713.884	48266.405	56840.	56710.
7	-0.174	-0.138010	72183.387	13119.266	5818.	5003.
8	0.091	0.063605	-212484.744	-226664.270	13822.	14476.
9	0.063	-0.016951	56625.317	50781.265	12564.	12520.
10	0.044	0.018177	277327.384	284092.553	39044.	38524.
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12	0.110	0.027721	615941.443	688418.937	67139.	66283.
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16	0.069	0.075997	70131.590	75152.108	25289.	24484.
17	0.044	0.052756	683202.193	980035.960	30267.	30867.
18	0.088	0.045558	-184106.263	-210621.122	39161.	39708.
19	0.091	0.075461	-1093355.271	-1125710.412	17467.	16385.
20	0.104	0.104352	-2639655.409	-2699929.074	30026.	31686.
21	0.060	0.041219	-463995.388	-501720.883	33692.	35790.
22	0.066	0.056664	-9184.982	-6669.704	15545.	15235.
23	0.054	0.045729	333920.735	364730.815	3254.	3133.
24	0.071	0.051655	120500.739	153454.717	26779.	27769.
25	0.073	0.046269	-348753.371	-371192.642	18578.	19564.
26	0.067	0.066667	-351211.000	-366332.100	0.	0.
27	0.074	0.097928	-163868.031	-163968.031	47383.	47383.
28	0.090	0.093524	303002.714	375654.550	1682391.	1696422.