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TRADE POLICY, COMMERCIAL MARKET RELATIONSHIPS, AND EFFECTS ON WORLD PRICE STABILITY

<u>Canada</u>

Ralph G. Lattimore

Introduction

There have been a number of important developments in Canadian agricultural trade policy over the past decade. Some have originated from perceived opportunities in the domestic and/or international markets while others are responses to pressures from the rest of the economy or the rest of the world. In addition, a wider set of policy developments at home and abroad have had an impact on Canada's agricultural trade even though that was not the original intent.

The Basis for Agricultural Trade Policy

Within the context of Canada's foreign policy set, commercial trade policy is committed to maintaining a relatively open trading environment. To a large degree this policy is dictated by the composition of resource endowments and economic growth objectives. Trade policy within the agricultural sector reflects this principle but is moderated by a strong desire to improve the equity component and ownership pattern in the agricultural production and marketing system. The expansion of the role and powers of marketing boards over the past two decades is a particularly important manifestation of this latter aim.

Agriculture has always played an important but seldom dominating role in overall Canadian economic development, although the regional picture is quite different. Supply responses in Canadian agricultural have been sensitive to the supply of technology and infrastructure focused on regional requirements. Due to the breadth of the resource endowments, agricultural supply has also been sensitive to levels of incentive relative to other sectors. As a resource rich country with a small domestic market, these incentives have been affected to a considerable degree by the relative buoyancy of world markets and foreign policy intervention. These influences have been important historically as well as in more recent times. For example, the prosperity of the Eastern grain sector was strongly affected 200 years ago by changing corn laws in Britain as well as by U.K./U.S./Canada trilateral trade relations. The result of these interventions were similar to those we face today in grain marketing.

Canada has always been a major importer of food. In early times, the colony was a net food importer. Today, food and agricultural imports continue at a high level over a broad range of products. High levels of consumer incomes place a large premium on year-round quality and variety. However, with increased research and market development efforts, an improvement in the selfsufficiency ratio of a number of products is likely to occur in the near future.

With the development of agriculture in western Canada, a net export position in certain agricultural products became and has remained an important source of economic growth. The importance of these export products has varied, depending on relative international prices for forest, mineral, and agricultural products. For geographic and other reasons, cooperative efforts in primary agriculture have always been strong in Canada. However, for many decades these efforts were not stimulated by governments. The first establishment of the Canadian Wheat Board (CWB) in 1919, for example, was primarily a response to the establishment of similar agencies in the United States and by the Europeans. It was disbanded immediately following the crisis and 18 years passed before the Wheat Pools finally won approval and support for group action in grain marketing. This historic conflict exemplifies conflicts in marketing philosophy which continue today.

Throughout this early period agricultural trade flourished both in terms of expanding exports and imports. Government support for agriculture was limited to include such things as research, extension, modest price support and credit operations and support for the recreated CWB.

Over the last two to three decades there has been a growing political acceptance of the producer's desire to buffer the impact of technological change in agriculture, to provide a higher degree of countervailing power against the processing, distribution, and retailing (PDR) sector, to provide more orderly marketing arrangements, and to provide a greater degree of insulation for Canadian agriculture from shocks in world agricultural markets. Building on the experience of the CWB and Provincial fluid milk marketing boards from the thirties onward, approximately 110 marketing boards have been established covering most segments of Canadian agriculture.

During the seventies, three producer controlled national marketing boards (egg, turkey, and chicken) were created with administered price setting and supply control powers and supported by quantitative trade restrictions in accord with Article XI of the GATT.

Over the last period there have been continuing producer concerns over Canadian ownership at the producer, but more particularly at the processing and distribution level. These concerns are reflected in restrictions on who may purchase a quota and the Foreign Investment Review Agency (FIRA). (A notable exception to this tendency was the expansion of the vertically integrated hog industry in Quebec.) These concerns, in the face of mounting dissatisfaction with the performance of world agricultural markets, have tended to stimulate import substitution programs which increase self-sufficiency and insulate the domestic subsectors from external shocks.

A second major thrust has been associated with further development of agricultural potential (buffered by price and income stabilization programs). This thrust was aided significantly by research and extension programs. To a large extent the expansion effect has been export oriented for products like hogs, 'board' grains, canola, beans, corn, beef cattle, and a wide range of special crops. In developing this thrust, policy intervention was important though trade policy instruments played a more neutral role.

The pattern of trade in agricultural products over the past 5 years (table 2.1) reflects the effect of these policies to some extent. Net trade in grains, special crops, oils, and meat has expanded as a result of an expanding agriculture in both western and eastern Canada. Net trade in poultry and eggs have remained relatively static under supply management schemes, while dairy product net trade has expanded.

	•	:	:	:	:	:
Commodity	: Average	: 1977	: 1978	: 1979	: 1980	: 1981
	: 1972-76	:	:	•	:	:
	:					
	:		<u>Millic</u>	on dollars		· · · · · · · · · · · · · · · · · · ·
	:					
Grain	: 1,889	2,187	2,301	2,649	4,227	4,648
Grain products	: 102	134	111	108	103	175
Animal feeds	: 53	94	81	114	126	135
Oilseeds	: 210	294	390	687	446	559
Oilseed products	: -113	-125	-149	-159	-65	-61
	:					
Animals, live	: 113	105	139	176	141	31
Meat	: -50	-73	-22	96	227	319
Other animal products	: 18	59	31	76	101	50
Dairy products	: 18	59	31	76	101	50
Poultry and eggs	: -14	-32	-32	-48	-11	-17
	:					
Fruits and nuts	: -409	-606	-751	-897	-928	-1,055
Vegetables (excluding	:					-
potatoes	: -169	-275	-336	-364	-309	-393
Potatoes	: 3	-4	-6	-10	26	21
Seeds	: 2	-4	-9	-20	-19	-32
	:					
Maple products	: 7	10	11	15	15	18
Sugar	: -283	-189	-165	-200	-532	-434
Tobacco	: 55	55	89	129	39	123
Vegetable fibers	: -66	-79	-87	-108	-125	-128
Plantation crops	: -265	-658	-708	769	-783	-716
Other agricultural	•					
products	: -102	-153	-175	-171	-162	-196
	•				•	
Total agricultural	:					
products	: 885	768	728	1.365	2.589	3.162

Table 2.1--Canada, net trade in agricultural products, 1972-81 1/

Food imports have also expanded rapidly in absolute terms. Net imports of fruit and vegetables in 1981 were more than one-third of grain exports. Plantation crops and sugar imports added a further \$1 billion to the food import bill.

Agricultural trade policy in the seventies has also responded to two related macro policy thrusts. The decade is marked by growing intervention and regulation of the economy as a whole (Stanbury, 1982). This was at least partially related to the persistent instability in world commodity markets, economic performance and foreign trade policy responses. It appears that the interventionist mood in Government provided greater opportunities for agricultural program and policy development as a means of maintaining intervention parity across major sections of the economy. Whether such parity has been achieved remains an unanswered empirical question, but the growth in program costs and tax expenditures benefiting nonagricultural sectors suggests that agriculture may not have received its relative share over the last decade. This issue may not be important from an efficiency standpoint; it may be very important in regional political terms in an environment of economic uncertainty.

Agricultural Trade Policies

<u>Tariffs</u>. Canada has three systems of tariffs, the British Preferential (BP), Most Favoured Nation (MFN), and the General System of Preferences (GS)) for selected developing country products. With two areas of exception tariff changes have not been used extensively in recent years as a major instrument to guide agricultural investment output and consumption. Generally, tariffs have been kept at low levels and in many instances are zero (Table 3.1).

Tariff concessions granted in the GATT Tokyo Round have resulted in further reductions in bulk agricultural commodity tariffs and a realignment of the gap between MFN and BP rates, particularly on products traded with the United States.

The tariff has been used more extensively in recent years to stimulate two areas of agricultural output--for import competing fruit and vegetable production and for agricultural processing industries. However, in the former case, these new horticultural tariffs with their ancillary surtax mechanism have been used selectively to have an impact only (or mainly) during the Canadian harvest period. The effect has been to support domestic price levels relative to international prices during the seasonal low-price period for the benefit of producers, while maintaining world-price parity at all other times to benefit consumers. The tariffs shown in table 3.1 for peaches and lettuce are representative of these horticultural tariffs.

Typical tariffs intended to promote an expansion in agricultural processing are shown in Table 3.1 for vegetable oils and processed vegetables. These tariffs range from 10-17.5 percent ad valorem. It is not clear, however, that the presence of these processing industry tariffs has had the desired effect on industry structure in term of firm ownership. There is a rationale for believing that these tariffs have tended to encourage the establishment of foreign-owned branch plants in Canada (Green, 1980). The justification for these tariffs is to overcome a perceived lack of economies of scale, vis-a-vis potential international suppliers.

<u>Export Subsidies</u>. Explicit taxpayer funded export subsidies are not used extensively for agricultural and food products. In 1977 the Government did write off the accumulated deficit in the export account of the Canadian Dairy Commission, and Federal dairy subsidies do apply to a portion of market shared quota destined for export but these are exceptions rather than the rule. The major forms of direct export assistance are export credits and export promotion through the departments of External Affairs, Regional and Industrial Expansion, Agriculture Canada; and the Export Corporation (CANAGREX) is purported to increase this effort.

<u>Quantitative Restrictions</u>. The most important trade policy instruments currently being used to increase the degree of self-sufficiency in agricultural production and to support the marketing and production plans of marketing boards are quantitative restrictions. These take the form of explicit quotas and import licensing arrangements under the Import-Export Permits Act.

-	:	:	: British	:
Tariff	• • • • • • • • • • • • • • • • • • •	: Unit	:preferential	:Most-favorite-nation
item	: Commodity	:	: tariff	: tariff
	:	:	•	
6000-1	: Wheat	:bushels	: Free	12 cents
5600-1	: Oats	:bushels	: Free	2.5 cents
5200-1	: Barley	:bushels	: Free	6.6 cents
5501-1	: Yellow dent corn	:bushels	: Free	6.9 cents
5505-1	: Grain sorghum	:bushels	: 6.9 cents	6.9 cents
27625-1	: Soybeans	:	: Free	Free
27605-1	: Rapeseed	:	: Free	Free
27704-1	: Soybean meal	•	: Free	Free
27712-1	: Corn oil, crude	:percent	: Free	10.0
27718-1	: Soybean oil, crude	:percent	: Free	10.0
27732-1	: : Corn oil, refined	; :percent	: : 12.5 cents	17.5
27739-1 501-1	: Soybean Oil, refined	:percent	: 12.5 cents	17.5
	: less than 200 lbs.	: pounds	: Free	1.0 cents
	: 200-699 lbs.	:pounds	: Free	1.0 cents
	: 700 lbs. and over	:pounds	: Free	1.0 cents
600-1	: Live hogs		: Free	Free
701-1	: Beef and veal, fresh,	1	:	
	: chilled or frozen	:pounds	: 2.0 cents	2.0 cents
704-1	: Pork, fresh, chilled,			
	: or frozen	:	: Free	Free
703-1	: Lamb and mutton, fresh,	;	:	
	: chilled, or frozen	:pounds	: 4.0 cents	4.0 cents
905-1	: Poultry, live	:pounds	: 2.0 cents	2.0 cents
930-1	: Chicken and turkey,	:	:	
	: eviscerated	:percent	: 12.5	12.5

Table 3.1--Selected Canadian import tariffs, agricultural products, 1982

Footnotes at end of table.

Continued

:	: . IImit	: British	: .Nost formulto potion
Commodity	: UNIC	: tariff	: tariff
:	:	:	
: Shell eggs	: doz.	: 2.0 cents	3.5 cents
: Powdered milk	:pounds	: 2.5 cents	3.5 cents
:		:	
: Butter	:pounds	: 8.0 cents	12.0 cents
: Cheddar cheese	:pounds	: 3.0	3.0 cents
: : Mixed feeds	; percent	: 5.0	5.0
: Apples. fresh	:	: Free	Free
: Peaches	:pounds	: Free	3 cents but not les
:	:	:	than 12.5 per-
:	:		cent for 24 weeks
•	:	:	maximum or free
: Lettuce	:pounds	: Free	1.25 cents but not
•	:	:	less than 15 per-
•	•	•	cent for 16 weeks
:	:	:	maximum in 2
:	:	:	periods or free
: · Potatogg table	: •100 lbs	:	36.6
· Corn canned	·nercent	• 6 5	12.5
· Tomatoas cannod	. her cette	• 13.6	13.6
$\frac{1}{2}$.100 lbe	· Fraa	\$1.00
· Jubacco unatommod	· 1h	• 17.28 cente	17.28
· · ··································	• ••••		27.20
	: : : : : : : : : : : : : :	: Unit : Commodity : Unit : Duter : doz. : pounds : : pounds : : Mixed feeds : percent : Apples, fresh : Peaches : unit : pounds : : Dutter : Dotatoes, table : Corn, canned : Sugar, raw (95-96) : Tobacco, unstemmed : Dutter : Unit : Unit : Unit : Dutter : Dotatoes : Corn, canned : Dutter : Dutte	<pre>: : : British : : Unit :preferential : Commodity : : tariff : : : : : Shell eggs : : doz. : 2.0 cents : fowdered milk : pounds : 2.5 cents : : : : : : : : : : : : : : : : : : :</pre>

Table 3.1--Selected Canadian import tariffs, agricultural products, 1982--Con't

1/ Import permit required.

2/ Subject to reductions up to 1987 as result of "phase-in" agreements arising out of the GATT Multilateral Trade Negotiations Tokyo Round. 3/ Canada, Australia, and New Zealand Trade Agreement rates are lower.

Source: Agriculture Canada, <u>Tariffs on Selected Agricultural Products:</u> <u>Canada, United States, B.E.C., Japan</u>, Ottawa, June 1980. Quantitative restrictions are used to protect the operations of the Canadian Wheat Board, Dairy Commission (CDC), Egg Marketing Agency (CEMA), Chicken Marketing Agency (CCMA), and Turkey Marketing Agency (CTMA). A quota is also in place for beef under the Beef Import Act. In 1982 import quotas in effect amounted to 6.3 percent of broiler chicken production, 0.6 percent of egg production, 45 million pounds of cheese, and 139.2 million pounds of beef.

Multilateral and Bilateral Agreement

A most important set of trade policies for Canada involve the GATT agreement and various bilateral and commodity agreements. The most important bilateral arrangement is the Canada/USSR grain agreement. Successive agreements since the early sixties have contributed to the USSR becoming the largest importer of agricultural products from Canada since 1980. In addition, there is a wide range of other bilateral agreements which have specific tariff concessions. A listing of bilateral agreements with significant agricultural implications is given in appendix C.

The Trade Effect of Policy Intervention in Canadian Agriculture

This section assesses the extent to which the existing institutional and policy structure of the agricultural sector has changed the volume, direction, and prices of trade in agricultural products. A final section will examine impacts on the stability of world markets. Initially a standard unilateral free-trade basis is chosen for comparison. Modifications are discussed later.

This analysis focuses on changes in the volume of output from the primary agricultural sector which have resulted from policy intervention as it existed in 1980. The primary sector is chosen so as to narrow the discussion and abstract from another set of trade policy effects of a different nature which result from intervention and regulation of Canada's agricultural processing system. Trade effects are estimated for the primary agricultural sector as a whole. This analysis complements subsector analyses provided in Barichello (1982A).

<u>Previous Studies</u>. There have been a number of studies which have estimated the degree of protection in Canadian agriculture and/or its trade effect over the past decade. Selected results from seven of these studies are presented in tables 4.1 and 4.2. Two types of price-related measures were used in these studies: rates of protection and subsidy (or tax) equivalents. In one study, carried out by Josling for FAO, trade effects were also computed.

In table 4.1, it is shown that there is a reasonable consistency between the estimates for some commodities and a marked divergence for others. Protection measures for canola, flaxseed, corn, soybeans, pork, apples, and primary agriculture as a whole are low with effective rates of protection ranging between -3 percent and 10 percent. Protection measures for other commodities range widely. For example, Soe-Lin (1980) estimates an effective rate of protection for the wheat sector of 13-15 percent. This is broadly comparable to the level of protection estimated by FAO (1974), Lattimore (1975), and Josling (1978). However, it is significantly lower than estimates obtained by Dauphin and Roma (1975), and Harling and Thompson (1981). Similar patterns emerge for barley, sugar, beef, poultry, eggs, and milk.

:	Wheat	: Barley :	Canola	: : :Flaxseed:	Corn	: :Soybeans
i		<u> </u>		: :		:
					Percent	
Nominal rate :						
of protection: :						
Wilkinson. 1970 :	1000-0070	(107-105)	-		-	Napindaria
Dauphin, 1970 :		-	jane enge	With Dig		-
Harling, 1976 :	0	0	-	Wat- 1986		Landerto
Soe-Lin, 1978 :	3.0	3.0	0	0	3.0	0
:						
Effective rate of :	•					
protection: :						
Wilkinson						-
Dauphin :	27.5	-				
Harling	40.4	66.9		-		
Soe-Lin :	-13.0	12.0		7.0	9.0	
	15.0	14.0	3.0	8.0	10.0	1.0
Producer subsidy						
equivalent:	анан сайта. В 1910 г. – С					
FAO, 1969	8.0	11.0			6.0	
Lattimore, 1974	4.0	4.0	-		2.0	
Josling, 1978	16.4			-	ALC - 428	
Glen and Carter,						
1970-81	: 14.5	9.1	5.2	4.7		-
Consumer tax						
equivalent:	:					
FAO	. 8.0	4.0		600 MB	6.0	
Lattimore	: -30.0	1.0			4.0	640-600
Josling	: -22.0					

Table 4.1--Recent measures of protection in Canadian agriculture

.

Continued---

	: : •Potatoes ·	: Reof	Pork	: :	Faae	: Sugar	: • MI16	: Applac	: Acri-
	: :			: :	Lyys	: Juyai	: MIK	: vhhias	culture
	:						Đa		· .
	•							TCONT .	
Nominal rate	:						•	į a	
of protection:	:								
Wilkinson, 1970	:								2.0
Dauphin, 1970	:			-					2.0
Harling, 1976	: 2.0	3.1	0.8	42.0	36.3	-31.0	0		
Soe-Lin, 1978	: 7.0	3.0	0.8	6.0	6.0	77.0			-
	:								
Fffeetter and a star	:								
LTTECTIVE FATE OT	•								
protection:	:								
WIIKINSON	:								0.7
Vaupinn	· · · · ·		2 5						/.0
Seculia		16 0	2.9		27 0	24 0	、		
508-L I II	· : 20.0	8.0	-3.0	38.0	31.0	27.4	215.0	1.0	
	:								
Producer subsidy	:								
equivalent:	:		•						
FAO, 1969	:					26.0	79.0		
Lattimore, 1974	:	-				3.0	48.0		-
Josling, 1978	:					7.6	62.3		
Glen and Carter,									
1970-81	:								
Consumer tax	•								
equivalent:	•								
FAO	:					3.0	78.0		
Lattimore	:			. 		-3.0	23.0		
Josling	:					15.0	45.0	-	

Table 4.1---Recent measures of protection in Canadian agriculture---Continued

Item	: : : : Unit :	Wheat	: :Barley :	: Corn	Sugar	Milk
'Montant de Soutien'	: : : : :Percent:	2.2	10.7	4.3	68.2	268.0
Trade volume effect	: : :Million: :metric : : tons :	.59	.54	.15	1.02	3.22
Increase in imports	: : :Percent:			21.4	2.1	<u>1</u> /
Decrease in exports	: :Percent: :	6.2	38.6	-	·	1/

Table 4.2--FAO Trade performance measures, Canada, 1968-70

-- = Not applicable.

1/ Switch from exporter to importer.

Source: FAO, "Agricultural Protection: Domestic Policy and International Trade," CCP 74/17/3, Rome, 1974.

The FAO study estimated that protective policies operating over the period 1968-70 resulted in wheat and barley exports 6 and 39 percent, respectively, higher than they would have been in a multilateral free-trade environment. Corn and sugar imports would have been higher by 21 and 2 percent, respectively, and Canada would have switched from a net export to net import position basis in dairy products.

Aside from differences in methodology, variations in these estimates can be attributed to three major factors. Firstly, the instruments employed have usually tended to stimulate production and these have changed markedly over the decade of the seventies. For example, Dauphin and Roma (1975), in choosing 1970 as the base year, included the impact of the Lower Inventories for Tomorrow (LIFT) program which has not been repeated. This choice of date raised their protection rate significantly. Secondly, the studies vary in their degree of coverage of protective instruments included. Finally, many protective instruments in Canadian agriculture are explicit stabilization measures of one type or another. Their application in counter-cyclical fashion leads to year-to-year variations in their protective effects as measured in these studies. This point may be demonstrated by the three estimates of Consumer Tax Equivalent (CTE) on wheat. The FAO estimate was made at the beginning of what was to become the two-price wheat policy, while export prices were closely aligned to the minimum International Wheat Agreement (IWA) price. The resulting tax on consumers was small. In the midseventies, the domestic milling price was kept low relative to the export value and the CTE became strongly negative.

It is noteworthy that the rates of protection estimated for the agricultural sector as a whole are positive but small relative to estimates made for other sectors of the economy. The effective rates of protection in the manufacturing sectors for 1970 where all positive and ranged from 2 percent on transportation equipment to 44 percent on petroleum and coal products (Wilkinson and Norrie, 1975.

The Trade Effect of Policy Framework

Policies designed or which result in changes in the volume of Canada's trade in agricultural commodities include explicit policy instruments of Federal and Provincial Governments and policies enacted by quasi-government producer or private institutions authorized by Governments.

Ideally, the unilateral trade effect of existing policies should be measured against a basis which reflects the degree of comparative advantage of the sector in the absence of policies, defined above. Two problems require recognition in addressing this issue. Firstly, Thompson and Abbott (1982) and others have pointed out that the degree of comparative advantage (disadvantage) in agriculture is a dynamic process with long lags involved between investment and equilibrium trade levels. Protection rates, as normally calculated, may, therefore, be a poor guide to trade effects which may be in the process of expansion or contraction. Secondly, some policy instruments which are intended to have a protective effect may be producing externalities which mask or reduce the trade effect to a large degree. The simplest example is the case of administered pricing for commodities like eggs, poultry and industrial milk in Canada. In these cases output restrictions reduce the trade effect of and may actually reverse it.

There are also more subtle effects. It is becoming increasingly clear that the competitive position of some segments of the marketing system has changed as a result of Government authorized group action at the producer level. As examples, Cahill (1982), Quarat-I-Elahi (1982), and Funk and Rice (1978) have found higher marketing or processing margins in the presence of marketing boards for apples, turkeys, broiler chickens, and feed products. In a similar vein, it has been argued by Green (1980) that tariffs afforded agricultural processing industries inhibit the movement towards plants of minimum efficient scale. Both these effects tend to reduce the trade effect of protection. That is to say, the contraction of net exports or the expansion in net imports would be expected to expand less under unilateral free trade than might be expected from a given reduction in the rate of protection.

The analysis presented does not take these postulated processing, distribution and retailing sector effects into account and focuses on the primary agricultural sector. The analysis includes the effect of a range of policy interventions, including tariffs and nontariff barriers, the exchange rate distortion, and direct commodity program expenditures in both the agricultural product and input markets. The trade effect of policies and programs in the primary agricultural sector is estimated from the overall effective rate of protection (appendix B) under three alternative assumptions regarding the contribution of program payments to value added in primary agriculture and two alternative aggregate supply elasticities. In each case, the effective rate of protection is adjusted for output restrictions in the primary agricultural sector resulting from quota policies. As such, these protection rates are not directly comparable with the studies cited earlier which did not account for the exchange rate and quota effects.

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<u>Policy Contributions to Value Added</u>. Public expenditures on agricultural programs (Table 4.3) are treated as a contribution to value added and, hence, a potential source of stimulation to domestic output. However, given the breadth of program involvement in agriculture, the most appropriate cut-off point for policies with supply effects is arbitrary to some extent.

Following Brinkman's (1982) classification, the effective rate of protection under scenario A is calculated over the period 1971-80 incorporating Provincial and Federal Government payments through commodity and income stabilization programs alone. Scenario B includes, in addition, the annuity value of Federal crop insurance, producer financing, storage and freight assistance, and trade promotion programs as given in table 4.3. This includes major program expenditures by Government to the railways to maintain service in the presence of Crow's Nest pass rates for grain transportation. These expenditures fall short of the 'Crow gap' as presented by Gilson (1982) and Harvey (1980). Nevertheless, given the monopoly position of the railways and the extent of regulation and intervention in the transport system in Canada, it is not clear that the 'Crow gap' as reported above, reflects transportation costs as they would exist in an unregluated situation (Appendix B). Hence. scenario B measures the change in value added, vis-a-vis an unregulated transport system where the transport tariffs would fall between the existing crow rates and the <u>"variable cost plus 10 percent"</u> rates used to compute the "Crow gap". Scenario C treats the semi-official estimate of the 'Crow gap' as the addition required to raise existing rates to a deregulated transport tariff situation.

<u>Commercial Policies</u>. Tariff and nontariff barriers are incorporated into the analysis to calculate farm cash receipts at border prices as outlined in Appendix B. International price comparisons are used where import quotas support the domestic price. Otherwise tariffs are used to compute border prices.

<u>Quota Adjustments</u>. At various times throughout the last decade, output quotas have restricted production or marketings of milk, grains and oilseeds (designated region), poultry products, and tobacco. For many commodities and provinces, these quotas have assumed market values which can be used to estimate the supply price of the commodity at particular levels of output. These estimates are used to reduce the level of effective protection for the purpose of calculating the trade effect of removing such intervention. Marketing quotas were also in place for a range of fruit and vegetable products in some provinces but in the absence of quota prices no attempt was made to remove their effect. The restrictive effect of fruit and vegetable quotas is thought to be less than for the other commodities due to the looser marketing arrangements and the possibilities for market substitution.

Estimation Results. The unadjusted Effective Rate of Protection (ERP) Coefficients (table B.3) are higher than those estimated in earlier studies for agriculture (table 4.1). Agricultural program costs have expanded rapidly over the decade and a wider array of programs are included in scenarios B and C than were used by Wilkinson and Norrie (1975), or Dauphin and Roma (1975). In 1980, unadjusted rates of producer protection are estimated to be 30, 47, and 55 percent under scenarios A, B, and C, respectively (table B.3).

: 	: 1971 : :	: 1972 : :	: 1973 : :	1974	: : 1975 :	: : 1976 :		
:				Million dollars				
Provincial Government direct :								
paymentscommodities :	NA	NA	2.1	14.0	49.7	83.0		
Federal Government direct :								
paymentscommodities :	138.6	135.5	161.5	313.5	302.2	326.2		
Federal crop insurance :	4.0	18.0	21.4	32.7	49.7	56.6		
-								
Federal producer financing :	23.6	25.6	10.4	8.6	5.9	7.6		
Federal storage/freight assistance:	103.2	97.8	87.4	164.7	196.2	206.5		
Federal trade promotion :	11.2	14.3	19.9	28.1	30.9	33.8		
Railway subsidies to producers :	251.1	276.7	285.2	246.6	237.9	246.8		
•								
Subtotal	531.7	567.9	587.9	808.2	872.5	960.5		
:				,				
Federal consumer subsidies :	NA	63.2	120.9	155.8	203.2	78.4		
Total :	531.7	613.1	708.8	964.0	1075.7	1038.9		

Table 4.3--Selected agricultural (food) program costs, 1971-76

Continued--

NA = Not Applicable.

Source: Table A.1.

: Item :	: 1977 : :	: 1978 : :	: 1979 : :	: 1980 : :	1981				
:	: Million dollars								
: Provincial Government direct :									
paymentscommodities :	119.2	31.6	9.7	25.5	50.3				
Federal Government direct :									
paymentscommodities :	584.2	374.3	390.5	444.9	NA				
Federal crop insurance :	73.2	75.6	78.2	102.5	NA				
•									
Federal producer financing :	6.9	7.7	9.4	14.6	NA				
Federal storage/freight assistance:	203.8	259.0	340.5	414.7	NA				
Federal trade promotion :	36.1	42.4	45.4	50.6	NA				
Railway subsidies to producers :	300.6	279.5	226.7	217.6	NA				
: Subtotal :	1324.0	1063.0	1099.7	1269.9					
Federal consumer subsidies :	34.9	44.4	NA	NA	NA				
: Total	1358.9	1107.4	1099.7	1269.9	NA				

Table 4.3--Selected agricultural (food) program costs, 1977-81--Continued

NA = Not Applicable.

Source: Table A.1.

Second, quota restrictions are estimated to have had a significant depressing effect on aggregate output (up to 50 percent of the additional value added from programs). The corresponding adjusted rates of protection for 1980 are 11, 26, and 33 percent. The wider margin between adjusted and unadjusted rates under scenario A is due to the high relative importance of dairy program costs in direct commodity expenditures. As can be seen from table 4.4, the bulk of livestock stabilization program costs are associated with the dairy industry. The relative importance of dairy output restrictions then, has a more marked effect in scenario A.

Provi	ncial	•	Federal		: Total Federal and :Provincial		
Beef	: Hog	: : Beef	: : Hog	: : Dairy	: Red : meats	: Red meats : and dairy	
			Million	s of dolla	<u>rs</u>		
				125.0		125.0	
			10.5	109.0	10.5	119.5	
		1	·	107.4		107.4	
			-	143.4		143.4	
16.6	0.1	61.7		251.1	78.4	329.5	
13.6				275.0	13.6	288.6	
16.5		46.5	-	233.1	63.0	296.1	
3.3		24.5	-	293.6	27.8	321.4	
3.9	-			271.5	3.9	275.4	
41.3	24.2			279.7	65.5	345.2	
177.8	19.6	47.1	-	187.9	244.5	532.4	
<u>1</u> /49.5	1.8	105.5	-	<u>1</u> /299.4	156.8	456.2	
	Provin Beef 16.6 13.6 16.5 3.3 3.9 41.3 177.8 <u>1</u> /49.5	Provincial : Beef : Hog 16.6 0.1 13.6 16.5 3.3 41.3 24.2 177.8 19.6 1/49.5 1.8	Provincial : : : Beef : Hog : Beef : Index : : :	Provincial : Federal : : : : Beef : Hog : Beef : Hog Million 16.6 0.1 61.7 16.6 0.1 61.7 13.6 1 1.6.5 46.5 1 1.3.3 24.5 1 1.3.3 24.2 1 1.49.5 1.8 105.5 1 1.49.5	Provincial:Federal:::::Beef:Hog:Beef:Hog:Millions of dolla:10.5109.010.5109.010.5109.010.5109.010.5109.010.5109.0107.4143.416.60.161.7251.113.6275.016.546.5233.13.324.5293.63.9271.541.324.2279.7177.819.647.1187.91/49.51.8105.51/299.4	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	

Table 4.4--Government stabilization payments

Note: Federal payments refer to beef, hog, and dairy stabilization programs for the year in which they were announced. 1/ Estimated.

Source: Agriculture Canada.

The impact of removing intervention in the agricultural sector on the agricultural trade balance is estimated using the framework outlined by the following model:

$S = f(P_S), E_p^S = 0.2 \text{ or } 0.5$	(1)	
$D = f(P_{d}), E_{p}^{D} = 0.25$	(2)	
$E = f(P_w), E_p^E = -5.0$	(3)	
$\Pi = f(m + E), E_{m+e} = -0.5$	(4)	
$P_s = (1 + t_i)P$, $t_1 = 0.11$ or 0.26 or 0.33	(5)	
$P_d = (1 + t_2)P, t_2 = 0.10$	(6)	
$\mathbf{P} = \mathbf{P}^{\mathbf{W}}$	(7)	
S = D + E	(8)	

<u>Where</u>: S, D, and E represent output, consumption, and net trade in agricultural products; P_s , P_d , P, P_w represent the price of agricultural products driving producer, consumer, the economy, and world prices; and Π represents the exchange rate in terms of U.S. dollars, t_1 and t_2 are the tariff equivalent protection rates afforded producers and consumers (negative), and m is the nonagricultural trade surplus.

The current producer protection rates (t_1) are taken from table B.3 and adjusted for quota restrictions. The trade effects are estimated using two supply elasticity assumptions. The lower elasticity of 0.2 corresponds to estimates of 0.05 for grains and oilseeds (in the aggregate) obtained by Colman (1980) and 0.3 for all other products. However, the estimated range for other crops and livestock varies from 0.2 to 1.0 (FARM, 1980). Consequently, a higher elasticity of 0.5 is also used. Following Hassan and others (1977), the demand elasticity is held constant at -0.25. Consumer food prices are assumed to fall 10 percent from their 1980 value under free trade based on the difference between farm cash receipts at domestic/border prices (table B.3). Hence, t_2 is set equal to 0.1.

Any reduction in Canada's net trade is likely to be sensitive to changes in world prices. The world market for agricultural products is highly distorted by policy intervention. These factors combined with Canada's trade share and customer loyalties would likely influence world-price levels in the event of a move towards unilateral free trade. World prices would tend to rise slightly offsetting the production fall and consumption rise in Canada and leading to a smaller decline in net trade than would occur in the small country case. This is thought to be especially true for wheat and dairy products where the export demand and import supply facing Canada is relatively inelastic. Overall, the elasticity of net export demand for Canadian agricultural products is assumed to be -5.0. The terms of trade effect for changes in Canadian trade in wheat, dairy products, and hogs would likely be less elastic than this figure, given the trade shares involved. However, the elasticity for coarse grains, oilseeds (perhaps), and fruit and vegetables is likely to be considerably higher.

The surplus on agricultural trade has represented a high proportion of the overall trade and current account surplus in recent years. In 1980, net trade in agricultural products was over 50 percent of the trade surplus in all commodities. A unilateral move to free trade would have a marked effect on this trade position and in the long run, the exchange rate could be expected to adjust to this change. This effect is also included in the evaluation.

Under all scenarios, a movement to unilateral free trade is estimated to have a major effect on the net trade position of the agricultural sector. From its 1980 value of \$2.6 billion, net trade is estimated to fall to at least \$2.1 billion and perhaps even as low as \$1.2 billion. This adjustment is a result of a reduction in output and producer prices but with only a small increase in the consumption of agricultural products.

The production and consumption adjustment is offset to some extent by a rise in the world price of agricultural products and a devaluation of the Canadian dollar (between 4 and 14 percent after full adjustment). Consequently, in most cases consumer prices fall by less than the tariff equivalent of the 1980 protection level and, in two cases, remain at or above that level.

The commodity composition of the trade adjustment can be judged from Barichello's results presented in table 4.6. Unilateral free-trade would result in a marked change in the production of industrial milk. Net exports are estimated to change from 9.7 million hectolitres to net imports equivalent to 23.0 million hectolitres (assuming an import supply elasticity facing Canada of 0.75). This effect would change the value of total net trade by over \$1 billion. The remaining effect would likely occur in the trade of

ltem	: : : Industrial : : milk :	Eggs	: : : Broilers: : :	Wheat	: Barley :	: : Oilseeds :
Net exports	: Hectolitres	<u>Dozen</u>	Pounds	and the state of the	<u>Tonnes</u>	
(1979-81 average)	9.7	-0.6	-47.3	16.8	2.7	1.50
Unilateral free trade	-23.0	0	0	15.9	1.9	1.42

Table 4.6--Unilateral trade effects, selected agricultural commodities

Source: Barichello, R. R., "The Economic Effects of Domestic Protection for Agriculture," paper presented to the U.S.-Canada Trade Consortium Meeting, Washington, D.C., Dec. 1982, appendix A. fruits and vegetables with perhaps minor change in net trade in beef, grains, and pork. Interestingly, net trade in poultry and egg products is expected to be enhanced by a movement to free trade. This results from restrictive quota policies and internationally competitive supply prices.

In scenarios B and C, an increasing portion of the net trade effect would result from changes in the volume of trade in grains and oilseeds as program contributions to these crops is assumed to be greater.

<u>Other Factors</u>. The foregoing analysis has disregarded a number of elements which would tend to reduce the trade effects estimated above. First, it was argued earlier that some elements of protection in Canadian agriculture have probably lead to lower levels of pricing efficiency in the processing and distribution sector. To the extent these effects are reversible, a movement to unilateral free trade would result in smaller changes in net trade than illustrated.

Second, from a trade policy standpoint, a unilateral adjustment is so unlikely to be contemplated that the trade effects do not closely resemble the outcome of politically feasible options for two reasons. In the first instance a number of protective policies are in place, principally because trading partners adopted similar policies. Furthermore, significant benefits would accrue to foreign suppliers were Canada to unilaterally reduce agricultural protection. Both factors imply that major policy adjustments would likely be the subject of multilateral negotiations of some breadth. In such an environment, the trade effects would be considerably smaller than those estimated in the previous section because the world price effects would be much greater. It has been estimated, for example, that multilateral free trade in dairy products would result in virtually no change in Canada's self-sufficiency in dairy products since the world-price would likely rise to equal the Canadian support level (Lattimore and Weedle, 1981).

Finally, this analysis has been backward looking and as such is not necessarily a good guide to future trade effects of policy changes. Since 1980 there have been a number of policy changes and other changes are likely. Future trade will be affected by the attendant levels of intervention.

<u>Stability Effects</u>--Protective elements of Canadian agricultural policy which tend to insulate the economy from destabilizing forces in the rest of the world tend to be concentrated in the dairy, poultry, and to a lesser extent in the beef industry. Under free trade in these products, Canada would absorb world market shocks concomitant with a market 10 percent the size of the United States. Again, the greatest relative stabilizing effect is likely to be towards the world dairy market, with a lesser stabilizing effect on North American poultry and egg markets and an even smaller beef market effect. However, given policy linkages, (for example, between U.S. and Canadian beef import policies), such qualitative effects would likely depend on the degree of internationally coordinated action.

Remaining Canadian agricultural markets (feed grains, oilseeds, fruit and vegetables, plantation crops, and sugar) are protected only by small specific or ad valorem tariffs which transmit world market fluctuations to the demand side of the domestic economy.

As outlined by Josling (1980), existing agricultural policy makes a contribution to international wheat market stability. He found that Canada's wheat inventory policy tended to be more stabilizing (largest negative price coefficient) than for all other major traders over the period 1968/69 to 1975/76. Using Canadian Wheat Board data, the price elasticity of demand for total wheat stocks in Canada over that period is -0.76^1 . Over the longer period to 1980/81, the elasticity is estimated to be -0.70^1 . This is an important result because over the latter part of the seventies, the grain industry in Canada was concerned with capacity problems in the delivery system and disruptions caused by the partial grain embargo of the USSR. Both concerns could have been expected to divert attention for international market stability during periods of softening markets in 1976/78 and in 1980. However, it appears that the stabilizing role of changing Canadian inventory levels was maintained almost to the same level as in the period to 1975/76.

Summary and Conclusions

The decade of the seventies has been marked by changes in Canada's agricultural trade policy which have flowed from changes in domestic agricultural programs, the general economic and policy environment, and international market instability and policy change. As a result, the level of effective protection afforded agricultural producers has fluctuated widely over the last 10 years but was no higher in 1980 than it was in 1971.

The 1980 trade effect associated with agricultural protection, however, is considerably lower than the level of support would suggest as a result of quantitative restrictions on the marketings of highly protected sectors. Policy changes to unilaterally remove protective elements are estimated to result in a reduction of agricultural net exports from their 1980 level of \$2.6 billion to between \$1 and \$2 billion after full adjustment. The reduction in exports and increase in imports associated with this policy change would impact most heavily on the industrial milk, grains, oilseeds, and fruit and vegetable sectors. Somewhat surprisingly, net imports of poultry and eggs under unilateral protection removal are estimated by Barichello (1982A) to decrease rather than increase. Policy intervention in Canadian agriculture contributes to world market stability, particularly through wheat inventory policy. It probably adds to instability in the world dairy market given the level of intervention of the United States. Western Europe, Japan. and the Nordic countries in dairy product exports. Canada's trade effects in other commodities are probably more marginal in terms of their impact on world agricultural market stability.

The methodology employed in this study is simple and leaves open a number of areas for further study. In particular, it ignores the trade effects of policy supporting much of the food processing, distribution, and retailing sector. Such protection is postulated to support additional oligopsonistic profits in these industries. If this protection were to be removed, the trade effects may tend to reduce or offset those estimated here for the primary sector. Second, the last comprehensive evaluation of protective elements across the Canadian economy was carried out using 1970 data. Policy changes since that time may have had a significant effect on factor shadow prices, which are only marginally incorporated into this study. More work in this area would add considerably to the level of confidence one ought to ascribe to the trade and protection effects estimated here from a general equilibrium standpoint.

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APPENDIX A

Selected Program Costs

Agricultural Sector 1971-80

The following table A.1 includes estimates of the cost of selected transfer payments for the Federal and Provincial Governments and the railways to the agricultural sector through selected programs. The programs include all major Federal direct subsidies through producer and consumer policies impacting upon product and factor markets. However, the only Provincial program expenditures included are those associated with stabilization and farm income assurance programs. It does not include expenditures under social programs, research and extension programs, quality control, and overseas development expenditures which are of a more indirect nature. The cost of the programs included represents around 80 percent of all Federal Government expenditures which are targeted at the agricultural sector and rural community.

The data is adapted from Brinkman (1982) and updated from 1978/79 with data from the Public Accounts of Canada, annual reports of the Agricultural Stabilization Board and Agriculture Canada.

	: :	. :	:	:	:	:	. :	:	:	:	
	: 1971 :	1972 :	1973 :	1974 :	1975 :	1976 :	1977 :	1978 :	1979 :	1980:	1981
	<u>: :</u>		•	•		:	:	:		•	
Provincial government direct pay-	:										
ments through Commodtiy Programs	:										
to producers:	: NA	NA	2.1	14.0	49.7	83.0	119.2	31.6	9.7	25.5	50.3
Federal government direct payments	:										
through commodity programs to	:										
producers:	:										
Direct milk subsidy	: 109.0	107.4	143.4	251.1	275.0	233.1	293.6	271.5	261.1	274.1	
Deficiency payments 1/	: 13.0	11.2	NA	46.5	26.0	28.7	70.5	47.1	30.2	47.8	
Price supports (APB)	: 0.5	0.4	NA	NA	0.4	1.1	NA	0.3	NA	1.2	
Lift 2/	: 5.7	NA	NA	NA							
Grassland incentive	: 9.8	15.6	16.8	14.9	NA	NA	NA	NA	NA	NA	NA
WGSA 3/	: NA	NA	NA	NA	NA	61.8	58.0	53.2	96.1	120.0	
Waterfowl compensation	: 0.6	0.9	1.3	1.0	0.8	1.5	2.4	2.1	3.1	1.8	
Writeoff CDC deficit <u>4</u> /	1997 1997 - 1997 1997 - 1997	NA	NA	NA	NA	NA	159.7	NA	NA	NA	NA
Subtotal	: : 138.6	135.5	161.5	313.5	302.2	326.2	584.2	374.3	390.5	444.9	
Federal crop insurance:	:										
Crop insurance act payments	: 3.1	4.2	15.2	31.1	48.3	56.5	72.8	75.0	78.0	100.0	
Payments to Quebec	: 0.9	1.1	1.5	NA	NA	NA	NA	NA	NA	NA	NA
Adverse weather payments	: NA	12.8	4.7	1.6	1.4	0.1	0.4	0.6	0.1	2.4	
Subtotal	: : 4.0	18.0	21.4	32.7	49.7	56.6	73.2	75.6	78.2	102.5	
Federal producer financing:	:										
Farm credit crop loss	: 8.9	8.4	6.8	4.7	3.5	2.4	1.7	NA	NA	NA	NA
Provincial grants	: NA	12.3	2.0	0.8	1.4	2.6	0.4	0.8	NA	NA	
Prairie grain advances	: 3.5	1.0	1.6	3.1	1.0	2.6	3.5	5.2	6.4	10.0	
Deficits pool	: 11.2	3.9	NA	NA	NA	NA	1.0	0.8	NA	NA	NA
Advance payments co-ops	: NA	NA	NA	NA	NA	NA	0.3	0.9	3.0	4.6	
Subtotal	: : 23.6	25.6	10.4	8.6	5.9	7.6	6.9	7.7	9.4	14.6	
Federal storage and/or freight	:										
assistance:	:										
Feed freight assistance	: 19.5	21.5	21.1	21.0	18.4	10.4	11.6	14.5	15.0	15.1	
Government elevators <u>5</u> /	: 3.1	3.7	4.1	6.4	8.1	7.9	9.4	0.6	NA	NA	NA
Drought relief	: NA	0.6	0.8	0.9	NA	NA	NA	0.4	NA	44.1	NA
Storage construction <u>5</u> /	: NA	NA	NA	0.1	0.2	0.3	0.5	0.7	1.0	1.3	
TWRA <u>6</u> /	: 25.8	12.8	ŃA	NA	NA	NA	NA	NA	NA	NA	NA
Hopper car purchase <u>5</u> /	: NA	4.6	NA	NA	4.1	20.8	21.0	21.1	21.1	30.4	42.4
CN/CP	: NA	1.3	NA	3.4	NA	NA	NA	NA	NA	NA	NA
CWB reserve stocks	: NA	NA	NA	1.8	3.2	2.7	3.4	1.8	Z.2	NA	NA
Freight equalization	: NA	NA	0.1	0.2	0.2	0.7	0.9	1.0	1.1	1.1	
Railways section 272	: 1.5	6.0	6.0	8.3	13.3	13.8	27.4	29.2	34.7	34.8	
Railways section 258	: 33.3	22.9	25.2	85.5	108.7	104.4	73.6	110.0	176.8	200.0	
Maritime freight	: 13.1	13.0	14.1	15.1	16.0	17.1	16.0	15.4)			

Table A.1---Selected agricultural program costs, 1971-81

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	·										
	: :	: 1972 .	: 1973 -	1974 -	: 1975 •	1976 •	1977 .	: 1978 •	1070 .		1981
						1270 .		:			1701
	:									· ~	
	:)	60.5	60.7	
Atlantic freight	: 6.9	11.4	16.0	21.7	23.7	27.1	29.9	41.3)			
Rapeseed products	: NA	NA	NA	NA	NA	0.5	2.5	3.8	3.0	3.0	
Feed freight adjustment	: NA	NA	NA	NA	NA	NA	5.0	11.7	9.8	8.9	
Co-op imp. Itd.	: NA	NA	NA	NA	NA	NA	0.8	0.8	0.8	0.8	0.8
UCO grain terminal <u>5</u> /	: NA	NA	NA	NA	NA	0.5	0.8	0.8	0.8	0.8	0.8
Boxcar rehabilitation <u>5</u> /	: NA	NA	NA	0.3	0.3	0.3	0.3	0.6	1.4	1.4	1.4
Branchline rehabilitation <u>5</u> /	: NA	NA	NA	NA	NA	NA	0.7	5.3	12.3	12.3	12.3
Subtotal	: 103.2	97.8	87.4	164.7	196.2	206.5	203.8	259.0	340.5	414.7	
Federal trade promotion:	:										
Ag. marketing and promotion	: 8.7	10.1	11.4	13.5	16.4	18.4	20.7	21.6	23.3	25.2	
Rapeseed utilization	: 0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Grain export credits	: 2.3	2.1	5.9	11.9	10.1	7.7	7.2	124	16.4	19.9	
Grains/oilseeds incentives	: NA	0.7	0.3	0.4	0.4	0.6	1.0	0.8	0.5	0.3	
CIGI	: NA	NA	0.6	0.4	0.4	0.5	0.6	0.7	0.8	0.8	
Marketing (IT&C)	: NA	1.1	1.4	1.6	3.3	5.8	5.8	2.7	4.0	4.0	
Milk promotion	: NA	NA	NA	NA	NA	0.5	2.4	3.8	NA	NA	
Subtota I	: 11.2	14.3	19.9	28.1	30.9	33.8	36.1	42.4	45.4	50.6	
Implicit railway subsidies to	:										
producers: CN/CP	: 251.1	276.7	285.2	246.6	237.9	246.8	300.6	279.5	226.7	217.6	
Federal government subsidies to	:										7
consumers:	:										/
Two-price wheat	: NA	63.2	69.4	81.2	188.7	65.3	21.9	43.8	NA	NA	NA
Subsidies on fluid milk and	· •			r							-
powder	: NA	NA	51.5	74.6	14.5	13.1	13.0	0.6	NA	NA	NA
Subtotal	: NA	63.2	120.9	155.8	203.2	78.4	34.9	44.4	NA	NA	NA

Table A.1--Selected agricultural program costs, 1971-81 --- continued

1/ Agricultural Products Board.

2/ Lower Inventories for Tomorrow Program.

3/ Western Grains Stabilization Act.

4/ Canadian Dairy Commission.

5/ The annualized value of capital expenditures under this term have been estimated at 10 percent per year.

6/ Temporary Wheat Reserves Act.

7/ Canadian International Grains Institute.

Abbreviations

P - preliminary; E - estimated; n/a - not applicable.

<u>Source</u>: Adapted from Brinkman (1982) and extended on basis of Public Accounts of Canada, Agriculture Canada, personal communications, and Annual Reports of Agricultural Stabilization Board.

APPENDIX B

The Effective Rate of Protection, Canadian Primary Agriculture

There are various measures available to estimate the trade effects of policy. The one chosen in this study is an adaption of the producer (consumer) subsidy equivalent and the effective rate of protection which is used in conjunction with a longrun supply elasticity. The protection index (termed ERP here) is used to measure the difference between resource returns under existing policy and those that would exist in the absence of the current policy set. When ERP coefficients are estimated across all sectors of the economy, the degree of resource pull (or push) on a particular sector can often be assessed without including computations of exchange rate and factor market distortions. This is because the mean and variance of sectoral rates of effective protection provide a basing point for the assessment of relative resource pulls.

However, when the effective rate of protection is computed (as is done here) for a single sector, a fuller accounting of distortions impinging on the sector needs to be accounted for. Hence, the ERP calculations include government and other sectors (other than primary agriculture) contribution to current value added in agriculture and exchange rate distortions in addition to the effects of tariffs and nontariff barriers specific to the agricultural sector.

The ERP estimates are also adjusted for output restraints arising from quota policies. These restrictions appear to constrain resource inflows into some agricultural subsectors. As a result, the trade effect of a change in value added to the sector can be expected to be less than would otherwise be the case. This piece-meal approach is less satisfactory from a technical standpoint than a general equilibrium model (see Corbo and Havrylyshyn 1980 for an excellent summary of this literature).

The effective rate of protection (ERP) for the primary agricultural sector over the period 1971-80 is calculated according to equation B.1. Since, the objective is to use the ERP to estimate changes in trade that would result from changes in domestic and trade policies on the performance of the agricultural sector, value added is adjusted for tariffs, nontariff barriers, and quantitative restrictions on the output of dairy products, grains and oilseeds, tobacco, eggs, broilers and turkeys, the degree of structural overvaluation of the exchange rate, and the provision of direct Government and private sector contributions

.... B.1

$$\frac{VA^{d} - AVQ - VA^{b}}{VA^{b}}$$

Where VA = value added, AVQ = annual value of quota, and b and d represent border and domestic prices. Value added in primary agriculture at domestic prices (VA^d) is defined as the gross value of output at producer prices including direct commodity and income-stabilization payments form the Federal and Provincial Governments (farm cash receipts) less the private costs of purchased farm inputs at domestic prices. Value added at border prices (VA^b) is the gross value of farm output at border values (excluding program payments), plus the difference between the social and private value of farm exports, less the social costs of purchased domestic and imported inputs paid by farmers, Governments, and the rest of the private sector. This computation is given by equation B.2.

 $VA^{b} = (P^{b}, Q^{T} - P^{b}, X^{T}) (1 + \Pi^{P}) - X^{g} \dots B.2.$

where Q^T represents the volume of total output; X^T represents the volume of total inputs; p^b represents border prices at the market exchange rate; and Π^P represents the social premium on foreign exchange;

X^g represents the <u>value</u> of Government and other sector inputs.

The degree of trade distortion of policies and programs which is redundant as a result of quantitative output restrictions is measured by the annualized value of quotas (AVQ). AVQ measures the extent to which VA^d overstates the output inducing effects of policies and programs.

Border Values (Pb)

These border-price adjustments take no account of the influence of Canada's trade on world prices. The terms of trade effect will be incorporated later. The border value of agricultural output is computed by applying ratios of the border/domestic farm-gate equivalent prices (Table B.1) to the value of output

and the second					1. A.		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
	1971	: : 1972 ; :	1973	1974	1975	: : 1976 :	: : 1977 :	: : 1978 :	: : 1979 :	: : 1980 :
: Dairy :	0.66	0.95	0.96	0.75	0.51	0.43	0.44	0.53	0.50	0.51
Eggs :	1.27	.81	.80	.89	.82	.82	.85	.86	.86	.88
Broiler chicken:	.63	.60	.67	.62	.75	.67	.72	.82	.78	.80
Wheat :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Oats :	.92	.92	. 95	.97	.97	.97	. 96	.96	.96	. 97
Barley :	.93	.92	.95	.97	.97	.97	.97	.96	.97	.97
Oilseeds :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Other crops :	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Cattle and :										
calves :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Hogs :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All others :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Table B.1--Price ratios, border/domestic, 1971-80

Source: See text.

at domestic prices. The value of output at domestic prices is taken from <u>Statistics Canada</u> (1982). Border prices are equated to domestic prices for wheat <u>2</u>/, oilseeds, cattle, hogs, and miscellaneous agricultural products. Domestic prices for some of these commodities have diverged from border values for short periods (for example, cattle in 1976/77 around the time of the Diethylstilbestrol ban) but were deemed to be small overall. The dairy price ratio is calculated by comparing the Canadian farm-gate price of industrial milk with the equivalent price of international traded butter and skim-milk powder at the border, adjusted for Canadian dairy processing margins presented by the Canadian Dairy Commission (CDC, 1981).

The broiler- and egg-price ratios are computed from the average farm-gate prices in the U.S. (<u>Agricultural Statistics</u>, 1981). The price ratios for barley and oats are obtained by subtracting the corn tariff of 8 cents/bushel till 1979 and 7.6 cents/bushel in 1980. Other crops include main fruits and vegetable tariffs (in-season) of 15 percent, fruit tariffs of 10 percent, and lower or zero tariffs on other components.

Border prices for purchased inputs were computed by deducting the nominal tariff and nontariff protection afforded these commodities over the period. These estimates are given in table B.2.

	Item :	Tariff and nontariff protection
		<u>Percent ad valorem</u> equivalent
Fertilizer Pesticides		9.0 9.0
Other crop Feed	expenses :	11.8 4.0

Table B.2--Tariff and nontariff protection of farm inputs

Source: Adapted from rates given in Economic Council of Canada, Looking Outward, Ottawa, 1975.

 $\underline{2}$ / Given that implicit Crow Rate transportation subsidies are treated as cost adjustments.

Government and Other Sector Inputs (X8)

The value of Government and other sector inputs into value added in primary agriculture is taken as the sum of direct Government program payments, and Government contributions to crop insurance, producer financing, storage and freight programs, and trade promotion. It also includes estimates of the cost of grain and oilseed transportation paid implicitly by the railways. These categories are defined for the most part by Brinkman (1982), and the estimated values have been adapted and extended from that source and are given in table A.1 and summarized in table 4.3.

Government programs which contribute to primary agriculture and rural program objectives are more extensive than those given here by approximately 20-30 percent of the total value. However, the excluded programs tend to have a noncontemporaneous or indirect impact on value added in agriculture and are hence not relevant in estimating the current trade effect. Some of the Government program expenditures refer to capital costs. Where possible, these costs have been annualized by taking an annuity value to measure their current impact.

Three levels of program expenditures are used to calculate effective protection for estimating the trade effect. Scenario A includes Provincial and Federal commodity program expenditures. These are categories 1 and 2 from table A.1. Scenario B incorporates categories 1-6 from table A.1. These are all major direct Government expenditures in agriculture, including contributions to the railways in compensation for the perceived loss in revenues associated with Crow freight rates on grain. Under scenario B, it is implicitly assumed that the Crow rates plus the annualized value of Government contributions to the railways approximates the equilibrium grain transportation rates that would prevail under a deregulated transport policy. In 1980 costs, deregulated grain transport costs in scenario B are implicitly taken as an average of \$14/tonne of grain, comprising \$5 of private costs at "Crow" (Harvey, 1981) and an equivalent of \$9/tonne through Government contributions.

In scenario C, equilibrium deregulated transport costs are taken at their "semi-official" value of \$22/tonne (Gilson, 1982) for 1980, which is the basis of the estimated "Crow benefit" to producers (or Crow gap to the railways and governments) amounting to \$469.5 million. Under this scenario, the annual transportation subsidy is taken as \$469.5 million in 1980 and reduced by 5 percent per year to \$295.9 million in 1971. The railway contribution is taken as this total "Crow benefit" less the annual value of Government contributions to the railways from category 5 of table A.1.

The transport subsidy to producers included in scenario C may tend to overstate the long-run equilibrium subsidy that would exist under a deregulated transport system. The basis for this hypothesis is that the "semi-official" rail cost figure of \$22/tonne is based upon estimates of railway variable costs plus a 10 percent return on investment. Such a procedure may overstate controllable variable costs of the railways, plus a contribution by grain producers to other costs concomitant with the relative elasticity of demand for railway transport service (Breimyer, (1977). First, the return on capital is based on cost consideration and there is no necessity for this cost to reflect the demand pattern for railway services. Second, it is not clear what length of production run is used to define variable costs. In short, there would appear to be sufficient uncertainty regarding the economics basis for the computation of the 'Crow gap' to use a second lower estimate of unconstrained transport tariff based on the long history of negotiations between governments and the railways. Scenario B is designed to approximate this latter viewpoint.

Shadow Price of Foreign Exchange

The difference between the private and shadow cost of foreign exchange is assumed to have remained constant over the period and is taken to be 7 percent as estimated by Jenkins and Kuo (1982).

Effective Rate of Protection (ERP)

The results of the ERP estimation are given in table B.3. Rows 1 and 3 present the value of gross output and purchased inputs taken from <u>Statistics</u>

Item :	Farmgate value	
	Dorder Value 1/	
Grains :	0.90	
Grain products :	.34	
Animal feeds :	.70	
Oilseeds :	.90	
Oilseed products	.70	
Live animals :	1.00	
Nest :	61	
Acac .	.01	
Deiny products	.01	
Poultry and eggs :	.64	
Fruits and rute	50	
Vegetables (evaluating potetoos)	.50	
Vegetables (excluding polacoes)	.50	
rotatoes .	. 50	
Maple products :	.50	
Sugar :	.00	
Tobacco :	.70	
Vegetable fibres :	.50	
Plantation crops :	.00	
Other agricultural products :	.70	
	.81	

Table B.3--Ratio of farmgate/border values, agricultural products

1/ These ratios were derived from marketing bill estimates in Kulshreshtha, S. N., Calvin Kelly, and Brent Swallow, "Estimation of the Canadian Food Marketing Bill, 1976-78," working paper Agriculture Canada, September 1981. Where estimates were not available from this source they were interpolated from similar products (value added form). <u>Canada</u> (1982). Purchased inputs are defined here as the total costs of inputs and depreciation less wages paid, rent, taxes, and interest payments. Rows 2 and 4 are the corresponding totals at border prices (that is, net of tariffs and nontariff barriers on the commodities). The additional social returns and costs associated with primary agricultural trade is given in rows 8 and 9. Government contributions to the value of agricultural output are given in rows 5-7.

Value added at domestic prices is then row 1 less row 3. Value added at border prices is row 2, plus row 8, less rows 4, 5, (or 6 or 7), and 9.

Effective rate of protection coefficients, unadjusted for quantitative restrictions, are given for the three scenarios of differing levels of Government and railway contributions in the final rows.

Adjusted Effective Rate of Protection

The effective rates of protection presented in table B.5 are adjusted in this section for output or marketing restraints in existence during 1980. Brinkman (1982) estimated the total capital value of quotas in tobacco, dairy, poultry, and egg production at \$2.043 billion in mid-1978. Assuming a 5 percent per year increase, quota values for these commodities are estimated to have been \$2.25 billion in 1980. Barichello (1982) has concluded that quota purchasers for these commodities in Canada behave as if they expect a 4-year payback at a 3-percent real interest rate. On this basis, the annual value of these quotas in 1980 would have been \$753 million. In other words, \$753 million of value added from the production of these commodities was required to hold quotas and was not a stimulus to higher output and trade.

The output restraining effects of delivery quotas for CWB grains and other crops in the designated region is considered to be important but is not revealed as explicit quota prices. The implicit value of these quotas during the last decade is estimated here by comparing the difference between board and nonboard grain prices in years when quotas were restrictive and when they were less or nonrestrictive. The period 1976-80 is taken as typical. The underlying computation is given in table B.4.

Commodity		•	Factor	(%)	
		•			
Machinery expenses		:	0.45		
Fertilizer	•		0.22		
Pesticides		:	0.36	·	
Other crop inputs		•	0.00		
Feed		•	0.06		
Other livestock inputs		•	0.00		
Building Repairs		•	0.00		
Electricity and telephone		•	0.00		
Depreciation		•	0.22		

Table B.4--Imported Cost Adjustment Factors

Source: Adopted from self-sufficiency ratios implicit in <u>The Input/Output</u> <u>Structure of the Canadian Economy</u>, Statistics Canada Cat. 15-506E, various issues. Treating 1975/76 and 1976/77 as open quota years, the average value of delivery restrictions over the 5-year period is estimated at \$7.16/tonne in 1980 prices. Then, conservatively assuming that these quota values applied only to wheat, the average annual value of delivery quotas is estimated at \$143 million/year. This value is added to the annual value of dairy, tobacco, and poultry quotas to give the total annual value of quotas used in equation B.1. The resulting estimates of the adjusted effective rate of protection are given in Table 4.5.

lton	:	0++	:Ag	ricultura	1:	Nat	:	: Dandungan	Caroumon	:	الم مر الم	: Excha	nge
	: •	ourpur	:00	\$1980B		ner trade	:	rroducer :	Index	:	WOFIG	: <u>ran</u> :C\$/US\$	e 5 Change
	:			*********		*******							
Existing policy, 1980	:	19.9		17.3		2.6		111-133	110		85	-	-
	:												
Unilateral free trade:	:												
	:												
Low-supply elasticity	:												
Scenario A	:	19.7		17.5		2.1		104	104		88		4.2
Scenario B	:	19.3		17.4		1.8		106	106		90		6.8
Scenario C	:	19.1		17.4		1.7		107	107		91		8.5
	:												
High-supply elasticity	-:												
Scenario A	:	19.4		17.5		1.9		106	106		89		5.9
Scenario B	:	18.7		17.3		1.4		110	110		93	1	1.9
Scenario C	:	18.4		17.2		1.2		112	112	•	94	Í	3.6
	:												

Table 4.5--Effect of unilateral free trade, Canadian agriculture

I/ Calculated at wholesale market or international trade prices.

2/ Under scenario A the producer price index is III, Scenario B, 126 and Scenario C, 133. These indices are equivalent to adjusted rates of producer protection of II, 26 and 33 percent from 1980.

3/ The elasticity of the exchagne rate (long run) with respect to a change in the trade balance is taken as -0.5.

4/ Low agricultural supply elasticity taken as 0.2.

5/ High agricultural supply elasticity taken as 0.5.

 $\underline{6}$ / The aggregate world demand elasticity for Canadian agricultural products is taken as -5.0.

Adjustment to Trade Price

The analysis of the trade and other effects given in the text is performed at prices approximating the market level which corresponds to international trade in agricultural products. To achieve this, the value of agricultural output is adjusted by the reciprocal of the weighted average ratio of farmgate/border values given in table B.5.

	: : 1971	: : 1972 :	: : 1973 :	: : 1974 :	: : 1975 :
	:		\$M illions	, current	
	:				
<u>Farm Cash Receipts</u>	:				
Domestic prices	: 4541	5510	6968	9011	10057
Border prices	: 4067	5047	6430	8129	8819
arm Value Exports	: 1598	1723	2147	3164	3230
<u> Total Purchased</u> Imports					
Domestic prices	: 2594	2852	3464	4305	4921
Border prices	: 2501	2705	3274	4073	4661
Imported Input Cost	: 455	488	570	704	837
<u>Gov't and Other</u> <u>Input Cost</u> (C)	: : 532	568	588	808	873
Export Value	:			/ 	
Adjustment	: 112	121	150	221	226
Imported Input Cost	:				
Adjustment	: 32	34	40	49	58
Value-Added	:				
Domestic prices	: 1947	2658	3504	4706	5136
Border prices	: 1114	1861	2678	3420	3453
Effective Rate (A)	: 29	16	13	21	29
Protection (B)	: 43	24	18	28	39
(unadjusted) (C) %	: 75 :	43	31	38	49
Footnotes: 1 Scenari	C A B C	see text			Continued

Table B.5--Effective rate of producer protection, Canadian Agriculture 1971-80 (unadjusted)

B,C,, see text. <u>ootnotes</u>:

continuea

	: 1976	: : 1977	: : 1978	: 1979	: 1980
	•	:	:	:	:
	•		\$Millions	s, current-	· '
Farm Cash Receipts	:				
Domestic prices	: 10088	10212	12040	14283	15665
Border prices	: 8680	8768	10694	12720	13963
Farm Value Exports	: 3231	3410	3815	4798	6302
Total Purchased	•				
Domestic prices	: 5578	5922	6917	8159	9336
Border prices	: 5368	5702	6643	7823	8950
Imported Input Cost	: : 1004	1077	1237	1447	165
Gov't and Other	•				
Input Cost (C)	: 961	1324	1063	1100	1270
Export Value	•				
Adjustment	: 226	239	267	336	44:
Imported Input Cost	•			•	
Adjustment	: 70	75	86	101	110
Value-Added	•				
Domestic prices	: 4510	4290	5123	6124	632
Border prices	: 2507 ·	1906	3169	4032	4063
Effective Rate (A)	: 47	70	34	29	30
Protection (B)	: 64	94	49	44	4
(unadjusted) (C) %	: 80 :	125	62	52	5

Table B.5--Effective rate of producer protection, Canadian Agriculture 1971-80 (unadjusted)--Continued

Footnotes: 1 Scenarios A,B,C,, see text.

APPENDIX C

Selected Commerical Agreements of Agricultural Significance in Force Between Canada and Other Countries, November 1982

Title and Place	In Force	Reference
Long Term and Commercial Agreement between Canada and Algeria (Algiers)	May 27, 1976	CTS 1976/23
Trade Agreement between Canada and Australia (Canberra)	June 30, 1960	UNTS 369/89 CTS 1960/9 ATS 1960/5
Exchange of Letters between Canada and Australia constituting an Agreement modifying the Trade Agreement of Feb. 12, 1960. (Ottawa and Canberra)	Oct. 25, 1973	CTS 1973/34 ATS 1973/28
Long Term Wheat Agreement between Canada and Brazil	Jan. 10, 1980 w/effect. Jan. 1, 1980	1.
Exchange of Notes between Canada and France concerning the construction, maintenance and operation of cattle quarantine station on the Territory of St. Pierre and Miquelon (Ottawa).	Apr. 3, 1969	CTS 1969/10 UNTS 733/291
Trade Agreement between Canada and New Zealand (Ottawa and Wellington)	May 24, 1932 (Successively extended and finally on Sept. 25/41 for an indef- inite period)	CTS 1932/2 CTS 1941/12
	Title and Place Long Term and Commercial Agreement between Canada and Algeria (Algiers) Trade Agreement between Canada and Australia (Canberra) Exchange of Letters between Canada and Australia constituting an Agreement modifying the Trade Agreement of Feb. 12, 1960. (Ottawa and Canberra) Long Term Wheat Agreement between Canada and Brazil Exchange of Notes between Canada and France concerning the construction, maintenance and operation of cattle quarantine station on the Territory of St. Pierre and Miquelon (Ottawa). Trade Agreement between Canada and New Zealand (Ottawa and Wellington)	Title and PlaceIn ForceLong Term and Commercial Agreement between Canada and Algeria (Algiers)May 27, 1976Trade Agreement between Canada and Australia (Canberra)June 30, 1960Exchange of Letters between Canada and Australia constituting an Agreement modifying the Trade Agreement of Feb. 12, 1960. (Ottawa and Canberra)Oct. 25, 1973Long Term Wheat Agreement between Canada and France concerning the construction, maintenance and operation of cattle quarantine station on the Territory of St. Pierre and Miquelon (Ottawa).Apr. 3, 1969Trade Agreement between Canada and New Zealand (Ottawa and Wellington)May 24, 1932 (Successively extended and finally on Sept. 25/41 for an indef- inite period)

1970, N	fay 13	Protocol amending the Trade Agreement between Canada and New Zealand signed at Ottawa as Wellington on 23 Apr., 1932 as amended (Wellington)	May 31, 1971	CTS 1971/21 NZTS 1970/27
1973.	July 26	Exchange of Letters between	July 26, 1973	CTS 1973/30

1973, July 26 Exchange of Letters between July 26, 1973 CTS 1973/30 Canada and New Zealand consti- w/effect from NZTS 1973/8 tuting an Agreement on Rates Feb. 1, 1973 and Margins of Preference (Ottawa and Wellington)

PERU

1970, May 7 Agreement between Canada and May 7, 1970 CTS 1970/12 Peru relating to the financing for the sale of wheat by Canada (Ottawa)

POLAND

1979, Oct. 4 Long Term Agreement (Grain) Oct. 4, 1979 between Canada and Poland (Warsaw)

UNITED STATES OF AMERICA

1941, May 28 Exchange of Notes between Canada May 28, 1941 CTS 1941/6 and the U.S.A. regarding wheat marketing (Ottawa)

UNION OF SOVIET SOCIALIST REPUBLICS

1981, Sept. 26 Agreement between the Government Sept. 26, 1981 of Canada and the Government of the Union of the Soviet Socialist Republics on Agricultural Cooperation

BRAZIL

1982, July 20	Long Term Wheat Agreement	July	20,	1982
	between Canada and Brazil	eff.	Jan.	1, 1983

November 1982

- ABBREVIATIONS:
- <u>CTS</u> <u>Canada Treaty Series (1928 onward)</u>, Queen's Printer, Ottawa
- BSP British and Foreign State Papers, London
- HBCT Handbook of British Commercial Treaties, Her Majesty's Stationery Office, London, 1931
- HT Hertslet's Commercial Treaties, London
- LNTS League of Nations Treaty Series
- <u>UNTS</u> <u>United Nations Treaty Series</u>, United Nations, New York
- <u>BTS</u> <u>British Treaty Series</u>, Her Majesty's Stationery Office, London
- <u>TIAS</u> <u>United States Treaties and Other International Acts</u> <u>Series</u>, U.S. Government Printing Office, Washington, D.C.
- ATS <u>Australian Treaty Series</u>, Australian Government Publishing Service Canberra
- <u>NZTS</u> <u>New Zealand Treaty Series</u>, Government Printer, Wellington

The notation "GATT" indicates that the country is a party of the General Agreement on Tariffs and Trade, Geneva, October 30, 1947, (CTS 1947/27, TIAS 1700, UNTS 55/61).

Source: Adapted from Commercial Treaties in Force (mimeo, external affairs) by Agriculture Canada.