EFFECTS OF FARM PROGRAMS ON GAINS FROM CANADA-U.S. WHEAT TRADE

Julian M. Alston and Colin A. Carter*

June 27, 1993

Invited paper prepared for a joint meeting of WAEA/CAEFMS

Edmonton, Alberta, July 11-14, 1993

Abstract

This paper explores the implications of domestic distortions arising from farm programs for the size and distribution of gains from bilateral trade liberalization and illustrates the ideas using the case of Canada-U.S. trade in durum wheat following the 1989 Canadian-U.S. Free Trade Agreement (CUSTA). The CUSTA resulted in increased sales of Canadian grain to the United States and the escalating trade resulted in a legal trade dispute. The conflict centered on the trade effects of domestic farm policy, because Canada and the United States have significantly different farm programs for major field crops. This paper argues that while the existence of farm programs will modify the size and distribution of the gains from trade, dissimilar farm programs may still permit increased trade volume and mutual benefits from freer trade. While disparate programs make implementing a free trade agreement difficult, we demonstrate that in the presence of existing farm programs, both countries can still gain from freer trade. In the case of durum wheat, Canada is likely to gain because the U.S. export subsidy program raises U.S. domestic prices and this makes it attractive for Canada to sell into the United States, rather than to third markets. The United States is likely to gain, too, in part because its export subsidy program is less costly than it would be in the absence of imports from Canada.

*Julian Alston is currently the Van Vliet Professor of Agricultural Economics at the University of Saskatchewan (on leave from the University of California, Davis) and Colin Carter is a Professor of Agricultural Economics at the University of California, Davis.

EFFECTS OF FARM PROGRAMS ON GAINS FROM CANADA-U.S. WHEAT TRADE

There has been much discussion in recent years of the gains from a general movement toward freer trade in agricultural products (especially under the auspices of the multilateral Uruguay round of GATT negotiations, see Tyers and Anderson 1992) and also of the gains from trade agreements to reduce import barriers (such as the process of EC enlargement, the Closer Economic Relations agreement between Australia and New Zealand, and the free trade agreements between the United States and Canada and, more recently, Mexico). Such discussions have often ignored the implications, if any, of other (domestic) distortions for the gains from reducing border distortions to permit freer trade. Occasionally, the existence of domestic distortions in farm programs is used as an argument against trade liberalization, or is held as a caveat against the form of liberalized trade (indeed, the agricultural exemptions from free trade agreements have often been a centerpoint of negotiations), but usually that has been a reflection simply of the implications of freer trade for the continued viability of the existing farm programs (e.g., the U.S. sugar program or the Canadian supply management schemes).

As a general rule we would favor movement toward freer trade for a variety of reasons. Such personal preferences notwithstanding, in a second-best world, freer trade might not always be mutually beneficial nor globally welfare improving. The impacts of differing agricultural policies between (amongst) countries on their benefits from a free trade agreement is an issue of general interest; we suspect that the impacts are not straightforward, are probably misunderstood, and may be important. This paper explores the implications of domestic distortions arising from farm programs for the size and distribution of gains from a bilateral trade liberalization and we use the case of the dispute between Canada and the United States over durum wheat to illustrate the ideas.

1. CUSTA and Agricultural Trade Disputes

Tariffs between Canada and the United States for agricultural products reached an all-time high in the 1930s and they have been gradually dismantled since then. The Canadian-U.S. Free Trade Agreement (CUSTA) came into effect in 1989 and served to further lower agricultural trade barriers. The additional trade generated by lowering barriers has resulted in numerous bilateral Canadian-U.S. trade disputes including disagreements over wheat, pork, corn, and sugar (e.g., see Moschini and Mielke 1992; Lermer and Klein 1990. These disputes have arisen partly because the two countries have dissimilar farm programs.

An important component of CUSTA was the agreement on a trade dispute settlement mechanism, which established binational panels for antidumping (AD) and countervailing duty (CVD) cases. Agriculture has been a major subject of AD and CVD disputes (Smith and Whitney 1992). The case of Canadian durum wheat sales was heard before the binational panel in 1992, under Chapter 18 of the CUSTA. The United States alleged that the growth in Canadian exports was due to the Canadian Wheat Board (CWB) selling into the U.S. at less than acquisition cost and that, in addition, the Canadian transportation subsidy led directly to increased Canadian exports to the United States. The binational panel did not agree with the U.S. claim and the panel made its final ruling in favor of Canada in January 1993. The panel found there was no compelling evidence that the CWB was selling below its acquisition cost.

The CUSTA has resulted in increased CVD and AD cases in agriculture for two main reasons. Firstly, the reduction of tariff barriers through trade agreements like CUSTA appears to lead to increased demand from special interest groups for protection through "unfair" trade practice laws. As discussed and analyzed in detail by Stallings (1990), CVD and AD cases have

become a major vehicle for seeking protection for agricultural products. Secondly, the implementation of CUSTA was complicated by the fact that Canada and the U.S. have significantly different agricultural policies for major products. For instance, key aspects of the U.S. wheat program include target prices, deficiency payments, acreage diversions, crop insurance, and export subsidies. In Canada, wheat farmers receive much of their government support through transportation subsidies but there is also the set of policies comprising the Guaranteed Revenue Insurance Program (GRIP). It is not surprising that an opening of the border between two countries with such different policies could lead to trade disputes.

The CUSTA has resulted in rising Canadian exports of wheat to the U.S. and Canada's share of the U.S. domestic durum wheat market has gone from essentially zero a few years before CUSTA, to twenty-five percent since CUSTA was signed. CUSTA led to greater trade and competition in the Canadian-U.S. wheat market and it ensured that the market will become an integrated North American market. Prior to the free trade agreement, barriers of importance were Canadian import licenses on wheat (and wheat products) and a U.S. tariff. As result of the CUSTA, a formula was developed to allow for removal of the Canadian import licenses and in return the U.S. agreed to eliminate its tariff of $0.21 per bushel on wheat.

U.S. farmers have successfully lobbied politicians to violate the spirit of CUSTA, and to use countervailing duties and export subsidies to retaliate against Canada for their rising exports. Under a recent decision, new export subsidy initiatives will be targeted to Canadian sales to Mexico, beginning in July 1, 1993. The U.S. farmers have argued that Canadian transportation subsidies (about $20 per metric ton) account for Canadians "dumping" wheat into the United States and Mexico. Canadians counter these arguments by claiming that the U.S.

Export Enhancement Program (EEP) has been the cause of rising Canadian exports to the United States. The EEP lowers third market prices and raises U.S. domestic prices, and thereby makes it attractive for Canadians to sell into the United States and Mexico. The Canadians add that the recently approved wheat EEP for Mexico will likely result in Canada exporting more wheat to the United States.

Below we analyze the economic effects of freer trade between the U.S. and Canada in durum wheat in the presence of domestic commodity programs. We examine the special case of durum, but our results are relevant to the more general issue of freer trade impacts between countries with disparate farm programs. As background, we discuss the relative importance of alternative explanations for increased U.S. durum imports. However, an empirical explanation of why the imports increased is not the main objective of this paper. A recent report by the U.S. International Trade Commission (USITC) evaluated the factors explaining these imports. Instead, we use a conceptual approach to show that increased Canadian durum sales into the U.S. can be beneficial (or harmful) to both the United States and Canada.

2. The U.S.-Canada Market for Durum Wheat

Durum wheat is a special variety of hard wheat that is used primarily for pasta products.[1] World production of durum is concentrated in a relatively few regions of the world and the annual production averages about 25 million metric tons (mmt.). Production by each of the major countries is shown in table 1. From the data presented in the table we find that production is concentrated in North America, Western Europe and North Africa. North

[1] Although a small amount of hard spring wheat is sometimes used by millers in a blend with durum, the substitutability between spring wheat and durum is very limited.

American average production of 5.4 mmt. per year is only about 20% of the world total but the U.S. and Canada dominate durum exports. The large importers are North Africa, Algeria and the USSR. The EC both exports and imports, but on net is an importer of durum. This is interesting given that the EC has been involved in a long-standing trade war with the U.S. over durum export subsidies.

Table 1. *World Durum Wheat Production and Trade: 1983/84 - 1989/90 Averages*
(million metric tons)

	U.S.	Canada	EC	North Africa	Algeria	USSR	Other	Total
Production	2.4	2.9	6.3	3.0			10.8	25.5
Exports	1.4	2.2	0.5				0.3	4.4
Imports			0.6	0.5	1.4	0.8		

Source: International Wheat Council, World Wheat Statistics.

The United States and Canada are two of the world's largest producers and exporters of durum wheat: together they account for about 75% of world exports. In recent years, most U.S. durum exports have been subsidized under the Export Enhancement Program (EEP), in competition with European Community (EC) export subsidies on durum. Notwithstanding its position as a major exporter, over the past five years the U.S. has imported significant amounts of durum from Canada.[2] There has been a sharp rise in U.S. imports of Canadian durum wheat, beginning in the mid- to late-1980s, going from zero to almost 500,000 tonnes (fig. 1).

[2] The U.S. practice of exporting large volumes of durum wheat, while simultaneously importing a like product is an unusual situation for U.S. agriculture. There are, however, several other instances of such intra-industry trade; a notable one is the tobacco industry where the U.S. exports about two-thirds of tobacco grown and imports about one-third of tobacco consumed.

[Figure 1 about here]

3. CUSTA and the Rise in Canada-U.S. Durum Trade

The shipments of durum from Canada have become a major trade irritant to the United States, and the binational ruling has not settled the issue. The U.S. government has argued that the Canadian Wheat Board (CWB) has violated section 701.3 of CUSTA; that U.S. customs import data on unit values show that the CWB is selling below acquisition cost (including storage, handling and freight). Under article 701.3 of CUSTA, public entities in either country cannot export agricultural goods to the other country at less than the acquisition price.

> *Neither Party, including any public entity that it establishes or maintains, shall sell agricultural goods for export to the territory of the other Party at a price below the acquisition price of the goods plus any storage, handling or other costs incurred by it with respect to those goods.* (CUSTA Article 701.3).

The CWB has never been precluded from selling into the U.S. market but CUSTA provides a more formal means of legitimizing sales.[3] With CUSTA there is less threat of imposition of Section 22 of the Agricultural Adjustment Act of 1933 which allows the U.S. Secretary of Agriculture to impose quotas on imports if it is determined that such imports are threatening U.S. price support programs.

Under CUSTA, the trigger for the removal of Canadian import licenses was equalization of wheat Producer Subsidy Equivalents (PSEs). PSEs measure government support as percentage of the value of production plus direct payments. In compliance with article 705 of CUSTA, wheat import licenses were eliminated in May 1991, based on the average of 1988/89

[3] The Canadian Wheat Board is responsible for the export sale of all prairie grown wheat and domestic sales for human consumption.

and 1989/90 PSEs. Canadian farmers received an average wheat PSE of 31 percent, compared with 27 percent in the U.S. over that two-year period.

CUSTA also eliminated Canadian subsidized freight rates on grains exported to the U.S. through the west coast of Canada. However, freight subsidies were retained for exports to the U.S. through the Great Lakes. This has become a litigious issue. Durum wheat producers in North Dakota viewed this situation as being an export subsidy and in violation of CUSTA.

> *Neither party shall introduce or maintain any export subsidy on any agricultural goods originating in, or shipped from, its territory that are exported directly or indirectly to the territory of the other party.* (CUSTA Article 701.2)

They raised the issue in 1989 but the United States Trade Representative determined that Canada had not violated this article because the freight subsidy applied to all shipments to Thunder Bay, whether destined for export or domestic use. However the U.S. Congress did instruct the United States International Trade Commission (USITC) to examine the "conditions of competition" between the U.S. and Canadian durum industries.[4] The USITC report concluded that the drought of 1987-89 was the main reason for increased durum imports from Canada. Price differences were not found to be a factor.

4. Factors Behind the Rise in Canadian Sales to the United States

Possible explanations behind the rise in Canadian durum exports to the United States, raised by the USITC, include:[5]

---

[4] This was USITC Investigation No. 332-285 "Durum Wheat: Conditions of Competition Between the U.S. and Canadian Industries." The investigation began on December 4, 1989. The final report was released in June 1990.

[5] For an elaboration on these factors behind increased durum imports see the USITC report and an earlier study by the consulting firm of Abel, Daft and Earley.

a. Reduced durum production in the United States.

b. Increased total U.S. durum consumption.

c. An increased Canadian durum share of U.S. consumption due to superior quality

d. Dumping of Canadian durum wheat into the United States.

e. U.S. export subsidies

We now explore these possibilities in turn.

(a) Reduced U.S. Durum Production

U.S. durum production is concentrated in the Northern Plains states of North Dakota, South Dakota, Minnesota, and Montana. Total U.S. production, ending stocks and imports are reported in table 2 for the 1983/84 to 1991/92 time period. The 1988 drought essentially cut U.S. durum production in half, from 2.5 mmt. in 1987/88 to 1.2 mmt. in 1988/89. The shortfall in domestic production was met by a drawdown in stocks, a lower amount of exports, and increased imports. However, from an examination of table 2, it is apparent that the trend towards U.S. durum imports had begun two or three years before the drought and continued after the drought (refer to figure 1 to see the trend continued upwards). It is also the case that Canadian yields were cut in half by the 1988 drought.

(b) Increased U.S. Durum Consumption

At the same time, domestic consumption increased, due to a rising trend in per capita consumption of pasta products. The data in table 2 therefore suggest that U.S. production shortfalls have not been a significant factor explaining the overall trend in U.S. imports of wheat from Canada, but that trends on the demand side might have contributed.

Table 2. *U.S. Durum Supply and Demand: 1983/84-1989/90*
(million metric tons)

	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92
Production	1.987	2.803	3.075	2.667	2.531	1.225	2.504	3.320	2.830
Domestic Use	1.388	1.198	1.170	1.442	1.361	1.606	1.633	2.068	2.313
Ending Stocks	2.700	2.700	3.300	2.600	2.300	1.600	1.400	1.700	1.500
Imports	0.082	0.109	0.082	0.163	0.245	0.299	0.354	0.544	0.490
Exports	1.687	1.660	1.442	2.232	1.687	0.544	1.497	1.442	1.225

Source: USDA Wheat Situation and Outlook and Agriculture Canada, various issues.

Table 3. *Canadian Durum Supply and Demand: 1983/84-1989/90*
(million metric tons)

	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92
Production	2.62	2.11	1.96	3.88	4.01	1.91	4.14	4.20	4.59
Domestic Use	0.45	0.50	0.52	0.82	1.22	0.65	0.78	0.76	0.86
Ending Stocks	0.76	0.52	0.55	1.62	1.63	0.85	1.36	1.57	2.21
Exports	2.58	1.85	1.40	1.99	2.79	2.03	2.85	3.23	3.09

Source: Statistics Canada, Cereals and Oilseeds Review Series, Cat. No. 22-007.

(c) Quality of U.S. and Canadian Durum Wheat

The relative quality of U.S. versus Canadian durum wheat has become an issue in this trade dispute. The argument is that the U.S. millers who purchased Canadian wheat after the drought, when there was a shortage of high quality U.S. durum, have established a preference for Canadian durum and are somewhat reluctant to switch back to U.S. domestic product. The U.S. and Canadian durum wheat production areas are contiguous, with very similar soil and

climatic conditions. However, the "quality" of wheat produced is generally recognized as being higher in Canada due to rigid government regulations. The licensing and grading systems are much different in the two countries and as a result Canadian durum has a reputation of being of high quality and uniform.[6] Government regulations in Canada tightly restrict the development and release of new wheat varieties. The upshot is that Canadian durum wheat has better milling characteristics and *ceteris paribus* would be preferable to a miller, over U.S. durum. The USITC report explained:

> *U.S. millers purchasing durum wheat from Canada are assured the average rather than the minimum for that grade as well as greater uniformity.* (p. x)

However, the USITC also recognized that:

> *Millers are often not willing to purchase on the basis of grade alone, but will bid for the supplies of high quality U.S. and Canadian durum wheat needed to produce the quality milled product demanded by U.S. pasta manufacturers.*(p. x)

(d) Dumping of Canadian Durum

U.S. interests have charged that the CWB is "dumping" into the United States (i.e., selling into the U.S. below acquisition price). As mentioned above, the USITC investigated this possibility. The USITC sent questionnaires to U.S. importers and millers that asked for prices paid for U.S. versus Canadian durum. The finding was that:

> *it is not apparent from the data collected by the Commission in this investigation that prices paid by U.S. Millers for Canadian durum are significantly different than prices paid for U.S. durum.* (p. ix).

> *For like quantities of wheat, U.S. prices and Canadian prices fluctuate, with no consistent price difference between U.S. and Canadian durum that explains the growth of durum imports from Canada between 1986 and 1989.* (p. 7-1).

---

[6] For a description of U.S. and Canadian grading and licensing systems see U.S. Congress, Office of Technology Assessment (1989a, 1989b).

The USITC also collected U.S. Department of Commerce monthly data on volume and value of imports but this was of little use because separate data for durum were not collected until 1989. However, Canadian customs data are available.[7] Figure 2 shows monthly average prices, based on these data, for Canadian exports to the U.S. versus "all other" destinations. The customs data indicate that the CWB earned an average premium of $13 per metric ton on durum sales to the U.S. between 1987 and 1991 relative to sales to other destinations. This premium might reflect a higher average quality of Canadian durum exports to the United States relative to other destinations. But it could also reflect some exercise of market power by the CWB; by choosing not to drive the U.S. durum price down to the world price the CWB is effectively price discriminating between the U.S. and other durum markets. It is difficult to reconcile these data with an argument that the CWB is dumping durum onto the U.S. market.

[Figure 2 about here]

(e) Role of U.S. Export Subsidies

The U.S. Export Enhancement Program (EEP) is an export subsidy program established in 1985 and designed to boost the volume of U.S. exports.[8] EEP has played an important role in durum wheat exports. Approximately one-half of U.S. durum exports in 1987 were sold under EEP, almost 100% in 1988, and about 20% in 1989. The size of the EEP bonus ranged from $25 to $50 per metric ton over the 1986 to 1989 period (Abel, Daft and Earley). In 1992,

---

[7] Canadian durum exports to the U.S. are primarily shipped through Thunder Bay. Durum exports to other destinations are shipped either through the St. Lawrence or Pacific ports. For this reason, the raw customs data had to be adjusted in order to make the two price series in figure 2 comparable. We adjusted the series by subtracting $30 per tonne from the price to "other destinations." The shipping and handling costs between Thunder Bay and the St. Lawrence are approximately $30 per tonne.

[8] For a description of the EEP program see Ackerman and Smith.

a total of 897,050 metric tons of U.S. durum exported under EEP received a total EEP subsidy of $38.1 million, an average of $42.50 per metric ton.

The EEP subsidies on wheat drive a wedge between U.S. domestic and world prices: they depress the international price and raise the domestic U.S. price (USITC). Such policies can work for the United States only so long as there are barriers to U.S. imports that prevent the price wedge from being arbitraged. The fact that the U.S. border has been open to some extent to Canadian durum has meant that the EEP policy has always been undermined to some extent by imports from Canada. U.S. trade barriers (and apparent voluntary restraint by the CWB) have meant that the arbitrage has been only partial, however.

Under these conditions, an opening of the border under CUSTA should result in more Canadian wheat flowing into the U.S. And, in the absence of any other distortions, an increase in trade following a reduction in trade barriers normally would be expected to be mutually beneficial. What makes the present example more complicated is the fact that both countries are exporters of the commodity in question. An increase in her exports of durum to the United States would be expected to benefit Canada as a net exporter (Carter, Karrenbrock and Wilson), but it is natural to suspect that an increase in imports would be to the detriment of a net exporter (such as the United States for durum wheat). We demonstrate below that the opposite case is possible: additional Canadian durum sales into the U.S. can be beneficial to the United States and can, in fact, be detrimental to Canada as a result of Canada's farm policies. We describe the qualitative impacts of freer trade in durum wheat given a U.S. export subsidy policy. Following that analysis, we lay out a general rule for gains from reducing trade barriers in the presence of other distortions and apply that to draw inferences about the likely directions

of gains from increased durum trade given a Canadian freight-subsidy policy and a U.S. export-subsidy policy.

5. Changes in U.S.-Canada Trade and a Stylized EEP Program

(a) Export Subsidy Impacts with no U.S.-Canada Trade

Figure 3 represents U.S. trade in durum wheat in the presence of a stylized EEP program. In panel (b) of figure 3, D_{RW} represents the net export demand facing the U.S. and ES_{US} is the U.S. excess supply curve. The free trade price is P_F. We represent the U.S. export subsidy with a shift down from ES_{US} to ES_{US}-S (not shown in figure 3). This represents a subsidy of S per unit exported, which equals the vertical distance $P'_{US} - P'_W$. The export subsidy increases U.S. exports but it also drives up the domestic price from P_F to P'_{US}. The export subsidy program drives a wedge (of $S = P'_{US} - P'_W$) between U.S. domestic and world prices, a result that rests on the U.S. having a barrier to imports so as to prevent imports from undermining the domestic price. Prior to CUSTA the U.S. used a tariff of $0.21 per bushel, combined with suasion applied to the CWB, to limit CWB sales to the U.S. market. For simplicity, we model that situation as if there were no imports from Canada.

U.S. welfare is necessarily reduced by its export subsidy policy. In panel (b) of figure 3, the net U.S. loss as a result of its subsidy is given by the area abc + $P_FbcP'_W$ (area abc is the distortion loss and area $P_FbcP'_W$ is the terms of trade loss). In addition, U.S. export subsidies harm the interests of competing exporters including Canada to the extent that prices are depressed in importing countries.

[Figure 3 about here]

(b) Effects of CUSTA on Subsidy Impacts

Following CUSTA, the CWB has an enhanced incentive to arbitrage the price wedge between the U.S. internal price and the price in third countries, by reducing sales to third markets (such as Algeria) and increasing sales to the United States. The reduction of Canada's third market sales increases the import demand facing the U.S. from D_{RW} to D'_{RW}. The impact of this movement is to tend to reduce the gap between the U.S. and world prices by driving the U.S. price down and the world price up.

At the same time, the increased supply from Canada into U.S. markets causes the domestic U.S. demand (for U.S. grown wheat) to shift leftward from D_{US} to D'_{US} and, therefore, the U.S. excess supply curve (ES_{US}) shifts right to ES'_{US}. This shift would tend to depress the world price (offsetting the increase in excess demand caused by the Canadian withdrawal from the world market), but it would be expected to be smaller than the shift of the excess demand that precipitated it. Thus a new equilibrium is established with a lower domestic U.S. price of P''_{US} and a higher world price (for U.S. exports) of P''_{W}.

The quantitative impacts of this set of interactions—on prices paid and received, and quantities produced, consumed, and traded, and on welfare and its distribution in the two countries—will depend on market parameters and the specifics of the policy. Effectively, both the excess supply from the United States and the excess demand facing the United States are made more elastic when the barriers against Canadian durum are reduced. This means that, for a given U.S. export subsidy regime, the U.S. exports more durum and imports more durum when the barriers to imports from Canada are reduced.

This arbitrage process would be expected to reduce the wedge between the U.S. and world prices (perhaps to the point where the marginal revenue to the CWB is equal between sales to the rest of the world and the United States). One can envision scenarios where the wedge would be greater than (or stay the same as) it would be without the border trade with Canada.[9] In the more likely event, however, the per unit subsidy is smaller as a result of CUSTA as shown in figure 3 where the price wedge after CUSTA is $S' = P''_{US} - P''_{W}$ rather than S per unit.

From the U.S. perspective, ceteris paribus, the smaller price wedge would imply a smaller triangle of social loss due to the subsidy. However, the quantity of subsidized U.S. exports is greater so that the impact of CUSTA on the budgetary cost of the export subsidy policy is ambiguous.[10] Thus the U.S. welfare impacts in the market for U.S. durum are somewhat ambiguous. In addition, the full U.S. welfare impacts cannot be seen in figure 3 because we have not included explicitly the U.S. market for Canadian durum. We now turn to consider the determinants of whether those welfare impacts are likely to be positive or negative.

6. Welfare Impacts of Freer Trade in the Presence of Farm Programs

The welfare impacts of a relaxation of border controls are complicated by the presence of other

---

[9] As the diagram is drawn, the price wedge due to the export subsidy is smaller when the (partial) arbitrage by the CWB is allowed to take place. Whether this would be so depends on the rules of the export subsidy policy, but any policy that did not allow a narrowing of the wedge due to arbitrage (e.g., a fixed per unit subsidy applicable on all U.S. exports) would likely be unsustainable in the face of competitive arbitrage. The fact that the CWB has sole export powers over durum means that the arbitrage is not driven by competitive forces. Instead, it would be expected to be managed to meet longer-run CWB objectives. For instance, the CWB might choose not to arbitrage the market to the point that would maximize short-run profits, in order to avoid a confrontation with the United States that could lead to a return to a closed border.

[10] See Alston, Carter and Smith (1993) for a discussion of the issue of social costs of export subsidies in relation to budgetary costs.

distortions. Even from Canada's point of view, the welfare impacts are somewhat ambiguous once we include Canada's own policies. To see this, consider figure 4 which represents the case of a small country which has an *ad valorem* export subsidy at a rate t. This country would be an importer at world price R (or at R+ΔR) but is an exporter when producers and consumers face a price of P (or P+ΔP). Typically it would be assumed that the exporter would be better off if its terms of trade improved. However, it can be seen that this country, which is an exporter solely by virtue of its export subsidy policies is, in fact, made worse off by an increase in the world price from R to R+ΔR (see Tyers and Falvey 1988; and Alston and Martin 1993). By analogy, whether Canada gains from an increase in exports to the United States depends on whether Canada would have been an exporter in the absence of the freight-subsidy policies.

[Figure 4 about here]

A more general set of statements about the impacts of distortions on the welfare impacts of border price changes was established by Alston and Martin (1993).[11] They showed that the effect of a price distortion on the welfare impact of a border price change is identically equal to the effect of the same border price change on the social costs of the price distortion. This

---

[11]Following Martin and Alston (1994) let H represent a money metric measure of total welfare as a function of a vector of world prices (P) and a vector of taxes (t), given a particular value of utility (u^1): $H = H(u^1, P, t)$. Hicksian measures of welfare change are defined by the change in the value of the expenditure function, ΔH^1. With a given value for utility, u^1, four situations may be defined by four alternative combinations of settings of the values for taxes and world prices—no tax distortions (t_0), a base level of world prices (P_0), a tax distortion (t_1), and new world prices (P_1)—so that: $H_1 = H(u^1, P_0, t_0)$, $H_2 = H(u^1, P_1, t_0)$, $H_3 = H(u^1, P_0, t_1)$, and $H_4 = H(u^1, P_1, t_1)$. Then:

Welfare impact of border price change with no distortions:	$A \equiv H_2 - H_1$
Welfare impact of border price change with distortions:	$B \equiv H_4 - H_3$
Welfare impact of distortions under old border prices:	$C \equiv H_3 - H_1$
Welfare impact of distortions under new border prices:	$D \equiv H_4 - H_2$

These definitions imply the following:

Effect of distortions on welfare impact of border price change:	$B - A = H_4 - H_3 - H_2 + H_1$
Effect of border price change on welfare impact of distortions:	$D - C = H_4 - H_2 - H_3 + H_1$

That is, B-A = D-C.

general result means that the welfare impact of border price changes will be unaffected by the presence of market distortions unless the border price change leads to a change in the social cost of market distortions. It is clearly a special case when both the direction and magnitude of the welfare impacts are unaffected by the presence of market distortions.

More generally, the welfare effects of a border price change in the presence of *any* distortion (whether introduced by the government or occurring naturally, and including the distortion that arises from failing to exploit international market power) may be in the same direction as they would be under free trade or in the opposite direction. What this hinges on is the size and direction of the effect of the border price change on the social cost of the pre-existing distortion, and that will depend, in turn, on the nature of the distortion and the functional forms of supply and demand.

In the case shown in figure 4, the country would have been an importer in the absence of distortions (and therefore worse off when the border price rises); in addition, with the ad valorem subsidy, the cost of distortion rises with the world price, exacerbating the cost of the existing distortion. In the case of durum wheat, it seems likely that Canada would still be an exporter, even without the existing Canadian policies. Thus, an increase in exports due to a rise in the effective U.S. demand would be expected to benefit Canada unless the increase in exports is associated with a worsening of the distortions due to the Canadian policy that offsets any potential gains from trade. We cannot rule out the possibility that Canada is worse off as a result of freer access to the U.S. market for durum, but the opposite result seems more likely.

The impacts on the United States are complicated in similar ways but perhaps in the opposite directions. That is, the U.S. subsidy policy is a distortion whose social costs are likely

to be diminished by the opening of the border with Canada; in such a case the United States may benefit from greater durum imports from Canada. Thus, even though the United States is an exporter, there may be mutual gains from an increase in U.S. imports from Canada. On the other hand, freer trade with Canada is associated with greater U.S. exports and the size of the price wedge could be exacerbated by freer trade, depending on the details of the policy and the conditions for market clearing established by the CWB. For these reasons, the impact of freer trade on the social costs of distortions attributable to U.S. export subsidies is ambiguous, even in the context of our stylized version of export subsidies.

In order to establish measures of the welfare impacts of the actual EEP policy in interaction with the changes in U.S.-Canadian border policies under the CUSTA, we need to specify explicitly the details of the policy and the details of the markets and the market-clearing processes that account for the coexistence of U.S. exports and imports and the incomplete arbitrage between Canada and the United States.

7. Conclusion

Increases in bilateral trade, associated with reduced trade barriers, might not be beneficial to either party or both parties when trade is affected by domestic distortions. Thus the existence of domestic distortions in the form of farm programs can mean that it is not welfare improving to join a bilateral trade agreement. On the other hand the existence of domestic distortions in the form of disparate farm programs need not eliminate the possibility of gains from trade arising from the formation of a trade agreement. The key condition for gains from a trade agreement is that any additional social costs of distortions due to the agreement should not

exceed the potential gains from trade (i.e., the gains if there were no distortions and there were free trade).

In the context of the CUSTA and Canadian-U.S. durum wheat trade, we suspect that both countries may have gained, although we cannot rule out the possibility that both have lost without conducting a specific detailed analysis. Our theoretical results indicate that such analysis needs to take careful account of the actual details of policies because the details are likely to matter. It seems clear, however, that U.S. durum producers' interests have not been served by the movement towards freer trade. That fact might account for the trade dispute; the possibility that the U.S. as a whole has not lost might account for the fact that there has not been an intervention to protect the U.S. industry.

8. References

Abel, Daft and Earley. *An Examination of U.S. Durum Imports from Canada*. Alexandria, VA.. Report prepared for the North and South Dakota Wheat Commissions, the Minnesota Wheat Research and Promotion Council, and the Montana Wheat and Barley Committees. January 1990.

Ackerman, K.Z. and M.E. Smith. *Agricultural Export Programs*. Washington, D.C. USDA/ERS, Staff Report No. AGES 9033, May 1990.

Alston, J.M. and W. Martin. "Border Price Changes and Domestic Welfare in the Presence of Distortions: A Generalization." mimeo. Department of Agricultural Economics, University of California, Davis, 1993.

Alston, J.M., C.A. Carter and V.H. Smith. "Rationalizing Agricultural Export Subsidies." *American Journal of Agricultural Economics* 75(November 1993): forthcoming.

Carter, C., J. Karrenbrock, and W. Wilson. "Freer Trade in the North American Beer and Flour Markets" Chap. 5 in *Free Trade and Agricultural Diversification: Canada and the United States*. A. Schmitz (ed). Boulder: Westview Press, 1989.

Lermer, G. and K.K. Klein. *Canadian Agricultural Trade: Disputes, Actions and Prospects*. Calgary: University of Calgary Press, 1990.

Martin, W. and J.M. Alston. "A Dual Approach to Evaluating Research Benefits in the Presence of Trade Distortions." *American Journal of Agricultural Economics* 76,1(February 1994): forthcoming.

Moschini, G. and K.D. Meilke. "Production Subsidy and Countervailing Duty in Vertically Related Markets: The Hog-Pork Case Between Canada and the United States." *American Journal of Agricultural Economics* 74(November 1992): 951-961.

Smith, J. and M. Whitney. "Dispute Settlement Mechanism of the NAFTA and Agriculture" Chap. 4 in *North American Free Trade Agreement: Implications for California Agriculture*. C. Carter and H. Carter (eds). Davis, California: University of California Agricultural Issues Center. 1992.

Stallings, D.A. "Increased Protection in the 1980s: Exchange Rates and Institutions." Presented at the annual meeting of the International Agricultural Trade Research Consortium, San Diego, December 16-18, 1990.

Tyers, R. and K. Anderson. *Disarray in World Food Markets: A Quantitative Assessment*. Cambridge: Cambridge University Press, 1992.

Tyers, R. and Falvey, R. "Border Price Changes and Domestic Welfare in the Presence of Subsidized Exports." *Oxford Economic Papers* 41(1988): 434-51.

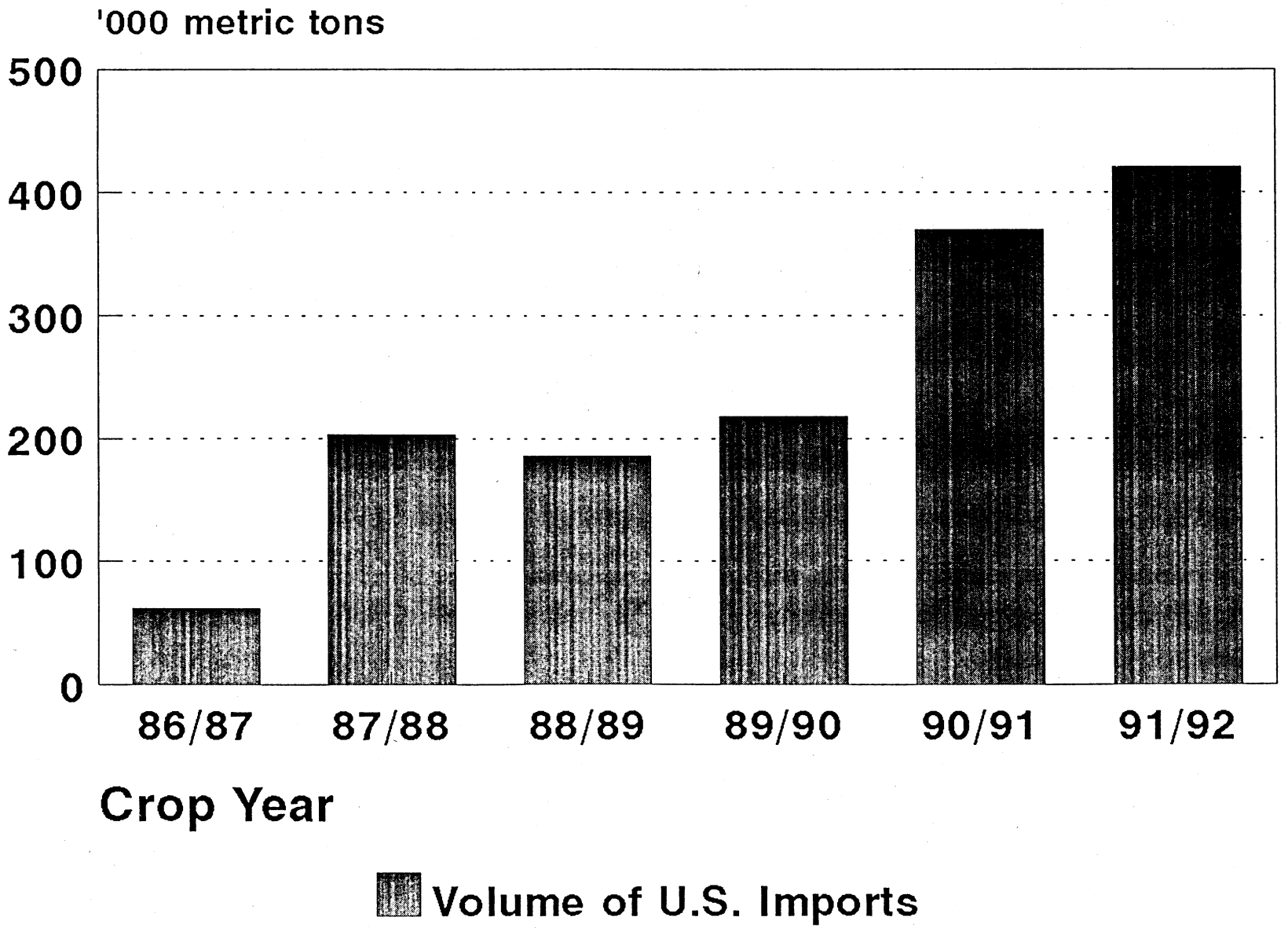
United States Congress, Office of Technology Assessment. *Grain Quality in International Trade: A Comparison of Major U.S. Competitors*. Washington DC: U.S. Congress, 1989a.

United States Congress, Office of Technology Assessment. *Enhancing the Quality of U.S. Grain for International Trade*. Washington DC: U.S. Congress, 1989b.

United States International Trade Commission. *Durum Wheat: Conditions of Competition Between the U.S. and Canadian Industries*. USITC Publication 2274, June 1990.

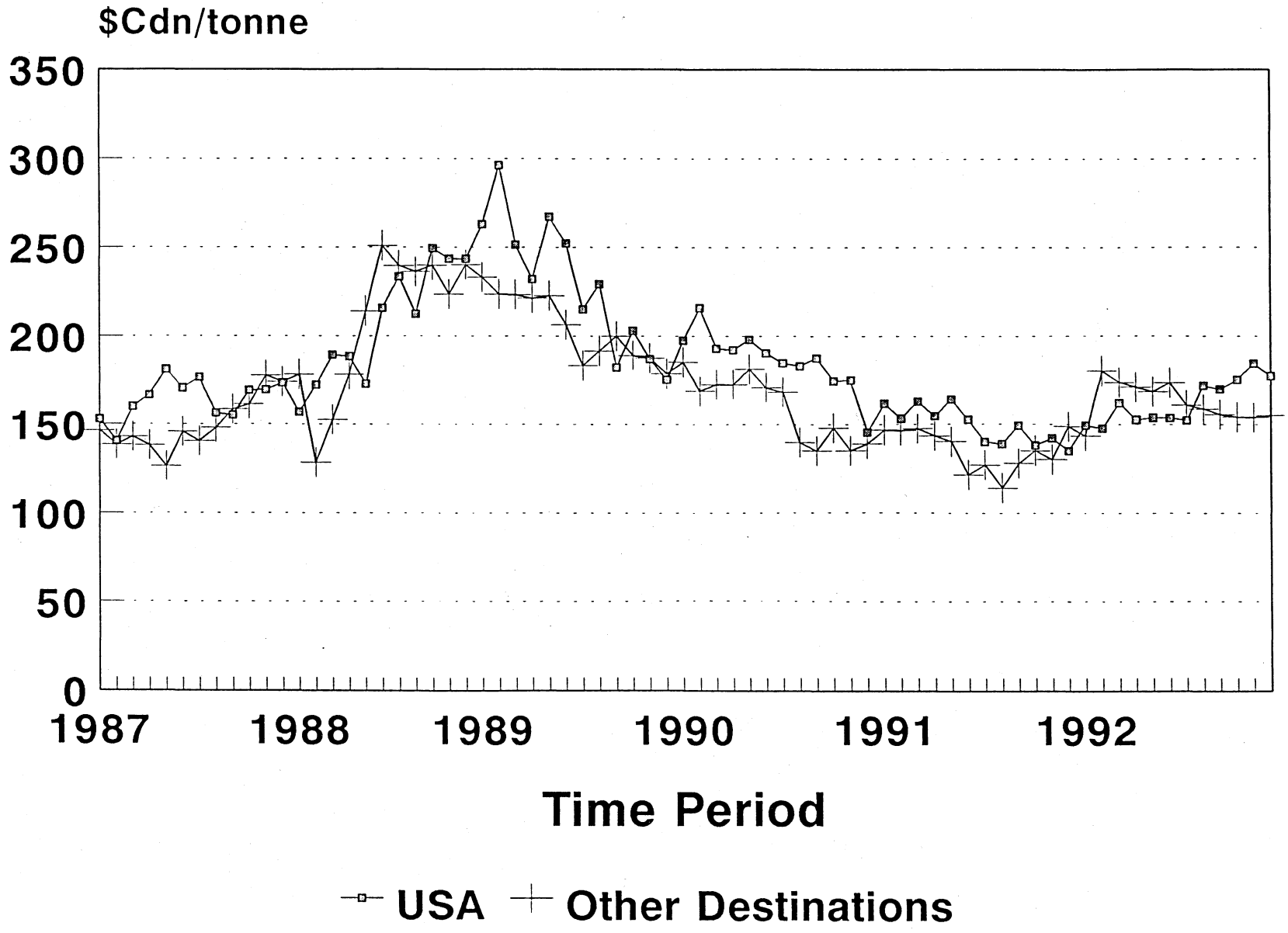
U.S.-Canada Binational Final Report. *The Interpretation of and Canada's Compliance With Article 701.3 With Respect to Durum Wheat Sales*. February 8, 1993.

Fig 1. U.S. Imports of Durum from Canada ('000 metric tons)



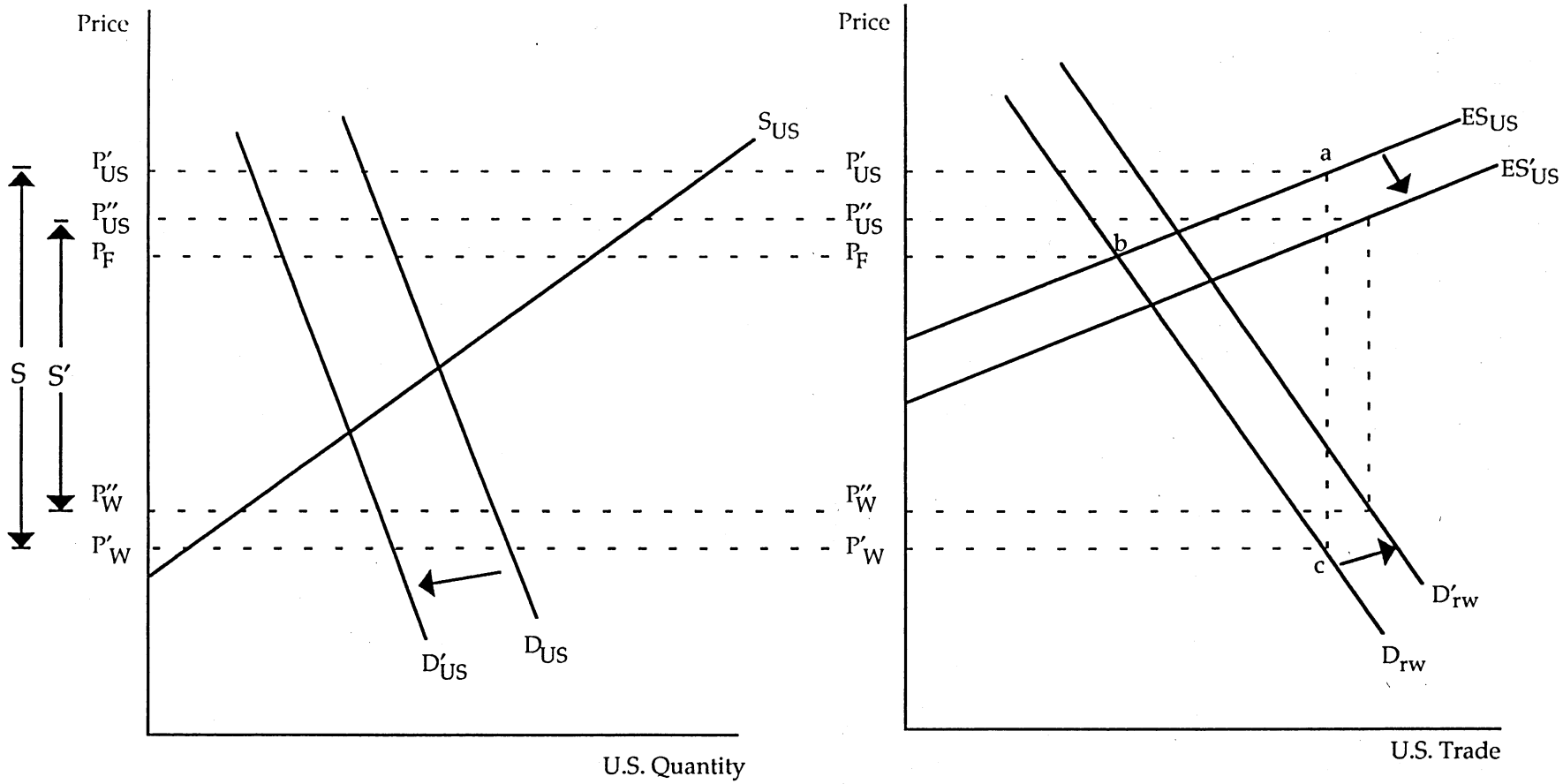
Source: Canadian Grain Commission

Fig. 2 Canadian Durum Export Prices
1987 - 1992



Source: Statistics Canada Customs Data

Figure 3. Arbitrage Effects of Canadian Durum Exports to the United States on Domestic and Export Markets for U.S. Durum



(a) United States

(b) Rest of World

Figure 4: Welfare Impacts of a Border Price Change with an Ad Valorem Export Subsidy