

## UNDERSTANDING THE CANADA/UNITED STATES GRAINS DISPUTE: BACKGROUND AND DESCRIPTION

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### INTRODUCTION

Grain trade has been an area of escalating friction between the United States and Canada. Similar problems exist in both the wheat and barley sectors. In large part, these stem from divergent marketing systems and policy mechanisms. Each country evolved with an autonomous set of agricultural and marketing policies, as well as regulations governing marketing and trade. Changes in world market conditions and competitive pressures within North America have given rise to increased trade (particularly United States imports from Canada). As a result, underlying trade policy and market mechanisms, as conventionally applied, are being challenged. Trade disputes have complicated—and threatened to derail—a movement toward market integration occasioned by lower tariff barriers.

There are numerous reasons for increased United States imports of wheat and barley. Some are transient, reflecting the unique circumstances of an individual crop year, while others are symptomatic of policies and institutional factors. Spatial price differentials are affected by a number of factors, including quality premiums, EEP subsidies and transport and handling costs. In addition, because of fundamental differences in marketing institutions and philosophies, Canadian initial payments (and therefore *street prices*) can differ drastically from U.S. spot prices. These price spreads are particularly apparent at interior shipping points. Fundamentally, the U.S. spot price mechanism is incompatible with Canada's price pooling mechanism, as conventionally administered. Restrictive delivery quotas and the demand for cash may also induce prairie-border-crossing shipments by Canadian shippers or producers.

The purpose of this paper is to discuss these problems from the perspective of the United States, and to suggest issues related to reconciliation. The paper is organized around marketing system differences and differences in policy mechanisms. The next section discusses in detail the effects of differences in grain handling costs and transport policies. In addition, the issue of price transparency is discussed. Briefly, the price transparency problem concerns the absence of reliable information about Canadian selling prices, which

(it is alleged) confers an advantage to the Canadian Wheat Board vis-a-vis competing U.S. merchandisers. In the next section, issues related to conflicting agricultural and trade policies are discussed. These include the effects of EEP, WGTA, CRP and the CWB sales monopoly. Simulation results are used to quantify the effects of these policies in the barley sector. In the fourth section, we discuss opportunities for resolving ongoing conflicts over North American grain trade. The paper concludes with a summary and discussion.

Empirical results presented in the paper are from several studies we have conducted on barley. These are from a detailed spatial equilibrium analysis of the North American barley and malt sector. The problems confronting barley are very similar to those in wheat. Differences may exist between them in terms of demand elasticities, spatial dimensions of supply and demand, and relative transport costs. However, many of our conclusions have broad relevance for both wheat and barley.

## **CRITICAL MARKETING SYSTEM DIFFERENCES**

Major differences exist between the United States and Canada in terms of grain handling and transportation costs. These reflect important structural differences, as well as differences in regulatory environments. Differences in handling costs are a subtle, but significant factor in the pattern of cross-border trade. More obvious is the Western Grain Transportation Act (WGTA) and related subsidy mechanism, which lowers rail rates for Canadian shippers. These features of the current marketing environment are briefly reviewed. In addition, price transparency, another point of contention between the United States and Canada, is interpreted in the context of asymmetric information.<sup>1</sup>

### **Grain Handling**

Commercial differences in grain handling contribute to some of the cross-border flows.<sup>2</sup> Handling tariffs are significantly higher in Canada than in the United States, due to different structural and regulatory environments. This has the effect of encouraging cross-border movements (from Canada to the United States) to circumvent the Canadian handling system.

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<sup>1</sup> In addition to marketing system differences discussed in this paper, others exist. Of particular importance are those related to quality regulations, as well as market structure issues. Quality differences are attributable in part to the different regulatory regimes and trade practices in each country. Differences in quality requirements between domestic end-users and the export market have important effects on the spatial distribution of trade flows. See Wilson and Johnson for a discussion of these issues in the case of barley, and Wilson et al. for a comparison of the application of grade factors in barley.

<sup>2</sup> See Wakefield and Agriculture Canada for a discussion of these differences.

**Cost Differences** Comparisons are made in Figures 1 and 2 using selected shipping origins and destinations.<sup>3</sup> For each shipping point, two Canadian comparisons are made. One depicts the total shipping and handling costs including the shipper portion. The other shows the total, including the government portion. The implicit assumption is that if/when rail rates change, they could change up to the total cost of shipping depicted in this bar. Handling costs are shown for both country and export elevation. Export elevation costs would not apply for domestic movements within North America.

Handling costs at Canadian country and export elevators are 19¢/bu. (U.S.) and 14¢/bu. (U.S.), respectively. These compare to costs of 8¢/bu. for United States country and export elevators.<sup>4</sup> The comparisons illustrate the total handling and shipping costs to two common destinations from comparable origins. Excluding the government portion, the total cost of shipping to Minneapolis is greater than from Winnipeg to Thunder Bay (Figure 1). However, the effect of the implicit rail subsidy of 19¢/bu. is partially offset by the handling cost differential of 11¢/bu. Similar conclusions are shown in comparison of total costs of shipping from Shelby, Montana, and Lethbridge to Portland and Vancouver, respectively; excluding the government portion, Canadian shipping costs are less, but the impact of the subsidy (30¢/bu.) is offset to some extent by the higher handling costs (33¢/bu. including export elevation, versus 16¢/bu. in the United States).

Figure 2 shows similar comparisons for shipments to selected U.S. destinations. Results illustrate the advantage given Canadian origins via the government transportation subsidy. However, this effect is dissipated due to higher handling costs and the United States rail share of the total movement. Two movements are shown from Lethbridge to Shelby and indicate that a "prairie-border crossing" movement by truck costs less than a direct rail movement.

**Reasons for the Differences** There are numerous reasons for these differences. Besides those resulting from differences in input costs and taxes, there are three important distinctions between these industries.

First is that the Canadian Grain Commission establishes handling regulations for licensed elevators and maximum tariffs for each function (e.g., storage, country handling, cleaning, fobbing).<sup>5</sup> In contrast, a multitude of competitive forces determine handling costs in the United States. The second reason is that these countries are at different phases of the rationalization process. Though the grain handling and transport systems developed similarly, the process of change in the past decade has differed drastically. The United States

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<sup>3</sup> Data sources for these figures are contained in Johnson and Wilson (1994) and are discussed in greater detail.

<sup>4</sup> In addition, an administrative charge of 9¢/bu. (U.S.) was assessed on direct cross-border shipments from Canadian farms (applied under the ex-farm-truck program). The status of this policy is not clear at this point.

<sup>5</sup> See Agriculture Canada (*Regulatory Review*) for a discussion of these issues.

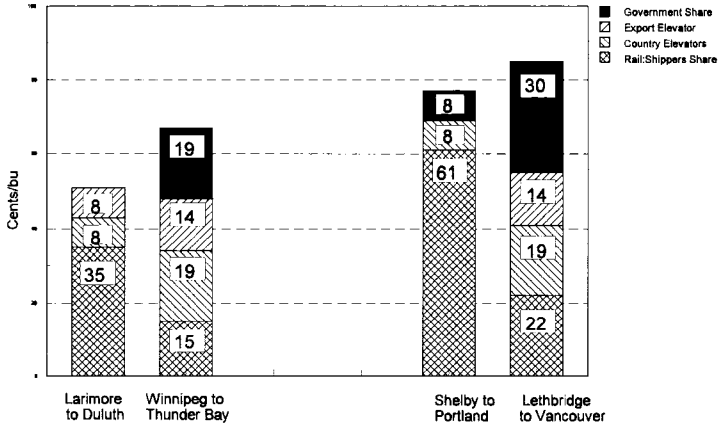


Figure 1. Grain Handling and Transport Cost Comparison for Third Country Export (US cents/bu)

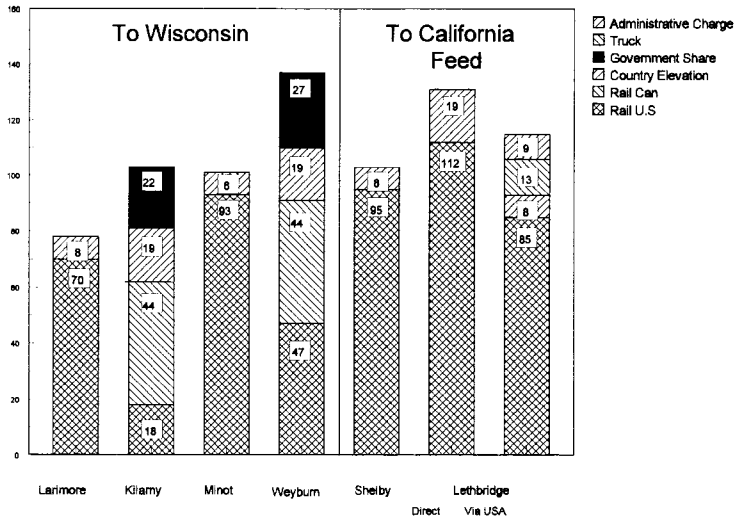


Figure 2. Grain Handling and Transport Cost Comparisons To U.S. Destination.

rationalization process began in the late 1970s in response to three sets of pressures: i) railroad initiatives; ii) competitive pressures within the grain industry; and iii) changes in the role and function of grain handling firms.<sup>6</sup> Though the Canadian industry has begun this process, it is likely at least a decade behind the changes that have occurred in the United States.

***Implications of Cost Differences on Trade Flows*** These differences have an impact on cross-border flows. The volume impact ultimately depends on the spatial distribution of production, and relative costs of alternative market channels. However, most important is whether Canadian grain is allowed to by-pass the first-handler, i.e., be shipped directly by truck from farms to end-users. Schmitz et al. (1993) discounted this as impractical, due to logistical and other commercial considerations; many U.S. end-users prefer to deal with commercial dealers capable of procuring larger volumes and providing a steady supply. Carter (1993a) assumed that elevator handling costs would be avoided completely by trucking directly to end-users; this was criticized as highly unrealistic.

Another possibility is to require commercial handling some place in the marketing system, either the United States or Canada, whichever is most efficient. We analyzed this effect in the case of North American barley flows using a spatial equilibrium model.<sup>7</sup> Our results suggest that the effect of handling cost differentials is fairly important. Specifically, equating handling costs in Canada to those in the United States would have the effect of increasing equilibrium exports to the United States from 1.39 mmt to 1.53 mmt. The logic is that, as a result of lowering marketing costs, it becomes more attractive for barley to enter the commercial marketing system. In so doing, exports from Canada to both the U.S. and off-shore markets expand, and prices increase. As a result of the higher prices associated with commercial marketing, domestic feed use in the Prairies is reduced (i.e., a movement occurs along provincial feed demand schedules).

## Transport Policies

***Institutional Setting*** An important policy mechanism in Canada for income support has been the WGTA rail rates and related subsidy mechanisms. This was also a highly contentious issue in the evolving North American grain dispute and would have to be reduced to comply with GATT. Briefly, this results in a pricing regime whereby the shipper pays a portion of the total rail shipment cost, referred to as the *Shipper's Portion*. The balance, the *Government's Cost* is paid directly to the railroads in the form of a subsidy. These levels and proportions are adjusted on an annual basis. Figures 1 and 2 provide an illustration of the relative impacts of the subsidy.

These rates apply to all grain and product movements from the Prairies to Vancouver and Thunder Bay. The CUSTA continued to allow these rates to Vancouver for third country

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<sup>6</sup> See Wilson and Tolliver (forthcoming) for a discussion of this process.

<sup>7</sup> These results are from Johnson and Wilson (1995b).

exports, and to Thunder Bay *including* for export to the United States. However, they would not apply for exports to the western United States via Vancouver.

**Proposed Changes** Several proposals have been made to change these rates over the years. In 1993 a proposal was made to change the rates beginning in the 1994/95 crop year resulting in a change in the method of payment (MOP). Over a 4-year period the payment would be made directly to producers, though the form of the payment was not determined. In late 1994 another more specific proposal was made to increase these rates beginning August 1, 1995 and to the full WGTA rate scale. These rates would remain in effect through 1999 at which time the WGTA would be replaced by the National Transportation Act.<sup>8</sup> As conditions have evolved in Canada, this subsidy will be eliminated effective August 1, 1995.

**Impacts on Trade Flows** With fully compensatory rates, shippers will pay the total cost of shipping, including the portion previously paid by the Canadian Government. Changes in the subsidy regime will effectively raise the shipping rate to Vancouver (for off-shore exports) and Thunder Bay for eastern North American as well as off-shore destinations. The effect of this change will be to make prairie border crossing movements relatively more attractive and no longer artificially force shipments through conventional channels.

However, the impact of this change depends on the spatial distribution of supply and demand relative to costs of alternative logistical channels. In the case of North American barley, Johnson and Wilson (1995b) show that compensatory rates would widen the gap between United States and Canadian producer prices. With unrestricted access to the United States market, equilibrium Canadian exports to the United States would increase from 1.4 mmt to 2.7 mmt. About 29 percent of total Canadian production would be exported to the United States, primarily to the western states.

## Pricing and Transparency

**Problem** One of the major problems identified by U.S. interests—both grower groups and traders—is referred to as the "transparency" problem. As an example, Peterson (1995, p. 4) claimed that "as long as the Wheat Board pricing policies remain secretive, this will be a sore point ... it is a bit of a stretch to compare a government sponsored monopoly with a private company." In an earlier investigation the General Accounting Office (GAO) (United States GAO, pp. 23-24) in discussing the concept of transparency pointed out that "the board does not reveal selling prices but says it sells its commodities at competitive rates ... and the board treats proprietary information no differently from large grain exporting companies in the United States."

The issue of transparency is often confused (or discussed concurrently) with the ability of the CWB to practice discriminatory pricing. As the GAO points out, "The board has unlimited authority to offer differentiated prices—relatively high prices for some markets

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<sup>8</sup> Other important provisions regarding branch line abandonment and car allocation were included in the proposal.

and lower-than-posted prices in other key markets—either in order to initiate new business or expand its market." The distinction and relationship between price transparency and discriminatory pricing is crucial from an analytical perspective.

Basically, transparency concerns an informational asymmetry, giving an apparent advantage to single selling agencies relative to U.S. trading firms. That advantage is manifested in the ability of such agencies to under-bid United States offers. The transparency problem is discussed in this section in the context of competitive bidding; an economic interpretation is developed in terms of bidding games. We discuss the mechanisms which facilitate and exacerbate transparency as a *bona fide* issue. The effects are then distinguished from those of price discrimination.

**Economic Interpretation** Much of the North American and world grain trade uses some form of competitive bidding as a means to conduct trade. Information is a crucial element in determining bids among competitors in bidding games.<sup>9</sup> Those firms with more refined information have a competitive advantage in these games. Thus, information is a crucial source of competitive advantage in commodity-based business such as the grain trade (Caves, 1979).

Using game theory concepts of bidding games, the transparency problem—or, more properly, the *opaqueness* problem—can be interpreted as a problem of asymmetric information. Rasmussen (1989, p. 53) defines asymmetric information as a situation in which some player has useful "private information". Incomplete information is when nature moves first, and that move is unobserved by at least one of the players. Thus, competitive bidding games where one player has more refined information than others is one of incomplete and asymmetric information. Philips (1988, p. 94) defines these games as incomplete in that other bidder's reservation values are not known. In these games the bidder with the more refined information set has a strategic advantage.

The effects of uncertainty about "reservation values" can be used to provide a tentative explanation of the transparency problem.<sup>10</sup> The problem is cast as a bidding game with asymmetric information. For simplicity, our analysis is static, applying to a one-shot bidding game. Strategies are limited to sellers' bids, and the winner is the seller with lowest bid—i.e., as in an export wheat tender. We do not consider longer term sales strategies, quality control, or other instruments of competition in this analysis.<sup>11</sup>

In developing their bids, each player takes into account the expected bids of their opponents—and the uncertainty about those bids. In other words, players base their bids on probability distributions (about their opponents' bids, or reservation values). The

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<sup>9</sup> We recognize that the formality of a public tender may not be as great for trades within North America, but the concepts presented here are applicable.

<sup>10</sup> See Preszler, Wilson, and Johnson (1992) for development and explanation of the model used to describe the results presented in this section.

<sup>11</sup> We recognize this is highly simplistic, but the results are suggestive of the impacts likely associated with the transparency problem.

transparency problem arises when uncertainty about one player's reservation price is much larger than for other players. Arguably, that is the case when one bidder represents a country with a single seller agency, whose transaction prices are not released (or are released selectively). Information about sales and commitments to alternative markets (representing opportunity values) are masked. One competitor possesses these characteristics; other competitors are represented by bidders with a narrower distribution (standard deviation) of reservation prices.

This type of competitive situation has important consequences for bidding behavior. In particular, the single seller agency has a strategic advantage due to the information asymmetry. This is manifested in: i) a higher probability of winning bidding games, and ii) a greater expected value of profit, relative to bidders with narrower distributions of reservation prices. These effects are attributable to the greater uncertainty (as seen by opponents) in reservation prices of the single seller agency.

***Factors Contributing to the Transparency Problem*** There are several aspects of the North American and world market place which give rise to the transparency problem and consequences described above. These are discussed briefly.

First, a crucial aspect of these results is that under asymmetric information, reservation prices for U.S. trading firms have a lower standard deviation than do those the single seller agency. The vast majority of transactions for U.S. domestic and off-shore sales are made through either formal or informal bidding processes. United States market prices and marketing costs are highly transparent. (The one caveat may be the lack of price reporting of premiums and discounts for quality characteristics.) In addition, results of all sales made under export assistance, including PL480 and EEP, are reported publicly. These mechanisms lower the standard deviation about trading firms' reservation prices.

The second factor concerns the time dimension of transactions. As is well recognized, EEP has created a two-tier price system in North America, one for domestic and one for world values. One of the effects of the administration of the EEP is that (generally) transactions are concentrated more in near-term shipping months than in deferred months. As a result, the time dimension of transactions has become distorted. This has had the effect of making domestic processors seek to increase the proportion of their purchases in more deferred shipping months, relative to what would be the case under normal carrying charge markets. U.S. trading firms and producers have become focused on capturing premiums associated with inverted markets. Concurrently, there is likely less competition in transactions for more deferred shipping positions.<sup>12</sup> In fact, this is one area in which the CWB has an advantage (see below).

The transparency problem is particularly acute for the types of grains that are contentious in North America, barley and durum wheat. Neither of these have a futures market (facilitating price discovery) and the cash markets have become highly decentralized, inhibiting accurate price reporting using conventional methods. In addition, these are grains

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<sup>12</sup> This phenomenon really makes price comparisons as a regulatory mechanism somewhat futile.



in which the possibility of large premiums and discounts for quality deviations is substantial. Taken together, this has created a high degree of uncertainty about reservation values (or procurement costs) for all market participants.

Third, there are some important characteristics of the Canadian marketing system that exacerbate the transparency problem. These include price pooling (with mandatory sales to the CWB) system, and the initial payment guarantee—both of which are legislated strategic advantages of the CWB. Because of the price pooling system and initial payment guarantee, the CWB does not have to compete in procurement against other traders. The combined effect is to give the CWB a strategic advantage in competitive bidding relative to United States trading firms.

Finally, it is important to recognize that *price opaqueness* is a growing problem throughout the North American and world market. This is being driven by at least two important industry trends. One is that changes in the marketing system has resulted in cost differentials among industry participants which are greater than previously experienced. Most notable is the effect of alternative car allocation mechanisms (COTS, PERX, ACOS, etc.) for rail shipments which produce different rated structures and performance criteria. In addition, there are several technologies for handling today that previously did not exist. The trend toward vertical integration has the effect of making it more difficult to observe components of marketing costs. Thus, there is a growing trend within the North American marketing system toward less price transparency.

**Price Discrimination** An alternative characterization of the problem concerns price discrimination. The single seller agency offers different terms of trade (e.g., prices) to different markets and buyers. This is obviously not the same as the transparency problem, although the ability to price discriminate is related to the lack of public information about transaction prices.

This form of competition is facilitated by three important factors. One is that there are inherent differences in price elasticities across markets. This provides an incentive to discriminate. Second, U.S. export policies, which are themselves discriminatory, exacerbate the differences in prospective returns from different markets. This practically forces price discrimination by a single seller agency. Finally, the fact that the CWB has a monopsony on procurement makes it easier to exercise discriminatory pricing than U.S. trading firms. Competition among trading firms, both on selling and in procurement, tends to prevent discriminatory pricing.<sup>13</sup>

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<sup>13</sup> Editors note: A reviewer points that, in an imperfectly competitive market, there are many factors that determine capability to price discriminate.

## **POLICY INCOMPATIBILITY**

Agricultural policies have evolved independently in the United States and Canada, with policy makers giving little thought to the (potentially) disruptive effects of cross-border trade.<sup>14</sup> That situation has changed in recent years, as larger United States grain imports have forced a recognition of basic policy conflicts.

From the Canadian side, much attention has focussed on the effects of United States export subsidies. The United States Export Enhancement Program (EEP) has had the effect of displacing Canadian wheat and barley from offshore markets while raising U.S. domestic prices. On this view, the United States policies are partially responsible for inducing an inflow of Canadian grain into the United States. In contrast, United States grain producers and policy makers have focussed on other aspects of the competitive environment—pricing policies of the Canadian Wheat Board, and Canadian rail subsidies—as possible causes of surging grain inflows. There is also growing skepticism about the wisdom of United States acreage controls in view of Canada's ready access to the United States market.

On both sides of the border, discussions have also revolved around trade restrictions, current or potential. In 1993-94, United States wheat and barley producers sought import curbs under Section 22 of the Agricultural Adjustment Act. Canada's agreement to voluntary limits on wheat exports (announced in August, 1994) helped to defuse this issue, and United States ratification of the GATT Agreement appears to have eliminated Section 22 as a basis for future United States trade action. However, Article 28 of the GATT allows import restrictions if adequate compensation is offered to injured trading partners, and the United States may also pursue other avenues (e.g., requiring end-use certificates) to restrain grain imports from Canada.

Canadian grain producers are affected not just by negotiated limits on grain exports, but by the Wheat Board's administration of export licenses. These licenses (and associated fees paid by producers) are integral to Canada's price pooling system, and to the Board's ability to sell selectively to the U.S. market. By restricting direct cross-border flows from Canadian producers to U.S. buyers, this system allows the emergence of large gaps between initial payments and U.S. spot prices--to the frustration of many Canadian producers. This has been a major factor behind the push within Canada for removal of Wheat Board control, a movement which led to the short-lived liberalization of barley trading in 1993. The effects of Wheat Board control (or its removal) on producer interests remains an extremely contentious issue in Canada. Arguably, the implications for U.S. producers (especially those situated near the border) are also significant.

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<sup>14</sup> Editors note: A reviewer indicates that CUSTA and NAFTA did consider trade disruptive effects, but problems still exist.

## Effects of Individual Policies: Simulation Results

To gain some insight into these policy questions, simulations were performed with a detailed spatial equilibrium model of the North American barley market. The Appendix gives a general description and Johnson and Wilson (1994) provide greater detail (Johnson and Wilson, 1995a, forthcoming). The base case is broadly representative of demand conditions in the 1993/94 marketing year. Demand parameters were calibrated so that model "predictions" of cross-border flows matched actual levels observed. This provides a comparison for alternative policy simulations, which are shown in Table 1 and briefly described below relative to the Base Case.

**Impact of United States Trade Restrictions** With implementation of the GATT Agreement, the United States cannot unilaterally invoke Section 22 to restrict grain imports. Restrictions could still be imposed under Article 28 of the GATT, and recent experience in wheat suggests the possibility (at least in the near term) of negotiated limits on Canadian access to the United States market. This prompts the question: what is the value to Canadian producers of U.S. market access?

A rough answer is found by constraining U.S. barley imports to zero. In that case, Canadian producer prices (on average) are 7¢/bu. lower than in the base case, and U.S. producer prices are 4 cents higher. Thus, complete elimination of U.S. barley imports would widen the cross-border gap in average producer prices by 11¢/bu. If 0.5 million mt of Canadian barley were allowed into the U.S. market, Canadian producer prices would be 4¢/bu. lower than in the base case.

**Compensatory Rail Rates in Canada** The Canadian Government has removed the WGTA benefit. This will have the effect of raising the cost of rail movements (i.e., from the Prairies to Thunder Bay and Vancouver) deducted from initial payments. For purposes of a model simulation, rates for applicable rail movements were adjusted by the full amount of the WGTA benefit.

Results indicate that fully compensatory rail rates in Canada would induce a larger flow of barley into the United States market. Canadian exports to offshore markets are reduced (relative to the base case) because of higher shipping costs to Vancouver. Without a significant supply shift, the elimination of Canadian rail subsidies seems unlikely to advance the interests of U.S. producers—contrary to the expectation of some U.S. policy makers.

**United States EEP Subsidies** In the base-case scenario, an EEP bonus level of \$32/ton applies to subsidized export shipments. To evaluate the impact of EEP on continental barley flows and producer prices, alternative simulations were run with different bonus levels. Results indicate that if the EEP bonus were reduced to zero, Canada would still export .5 mmt of barley to the United States. (These exports consist largely of two-rowed malting barley.) With higher EEP bonus levels, Canadian exports to the United States increase, as expected.

**Table 1: Results from Alternative Simulations**

Variable	United States Import Quota		Compensator		United States EEP Bonus			Return of CRP Acres
	Base Case	0 mmt	.5 mmt	Y	0	40	60	
				Rail Rates		(\$/mt)		
Canadian barley exports (mmt)	4.28	3.02	3.46	4.33	4.07	4.39	4.64	4.14
to United States	1.39	0	.50	2.70	.52	1.50	1.78	1.23
to offshore markets	2.89	3.02	2.96	1.63	3.55	2.89	2.86	2.91
United States offshore exports (mmt)	1.95	1.66	1.72	2.53	0.05	2.35	3.58	2.08
Domestic Feed Use (mmt)								
Canada	5.54	6.71	6.28	5.51	5.75	5.49	5.21	5.68
United States	5.36	4.36	4.76	6.07	6.39	5.02	4.09	6.63
Average Producer Prices								
Canada (U.S. \$/mt)	73.81	70.53	72.04	68.61	73.08	74.05	74.78	73.33
(\$/bu.)	1.61	1.54	1.57	1.49	1.54	1.61	1.63	1.60
United States (U.S. \$/mt)	83.46	85.58	84.83	83.36	81.69	84.70	87.12	80.90
(\$/bu.)	1.82	1.86	1.85	1.81	1.78	1.84	1.90	1.76

Source: Authors own analysis.

More surprising is the apparent effect of EEP on Canadian producer revenue: with higher EEP, Canadian producers earn higher average returns--despite the price-depressing effect of United States exports in subsidized offshore markets. This stems from the model's division of offshore markets into EEP and non-EEP markets, and its allowance that prices in these markets can be "disconnected."<sup>15</sup> In model simulations reported here, Canada retains its dominant position in non-subsidized (non-EEP) offshore markets, where prices are unchanged, and exports nothing to EEP markets. Thus, Canada gains from higher returns on its U.S. sales (due to higher EEP) without loss of offshore revenue. Of course, higher U.S. prices can only benefit Canada if there is free access to the United States market. When Canada is prevented from exporting to the United States (i.e., by hypothetical trade restriction), Canadian barley goes to both EEP and non-EEP markets; higher EEP bonuses are then detrimental to Canadian interests.

***The United States CRP Program*** Under the Conservation Reserve Program (CRP), highly erodible United States cropland is removed from production for a period of 10 years. Conceived as an environmental policy, CRP has had important supply effects for United States barley, particularly in the Midwestern states and Montana. To evaluate the significance of CRP, simulations were conducted in which CRP acres were restored to barley production in North Dakota, South Dakota, Minnesota and Montana. This leads to a 19 percent increase in United States barley supply, relative to the base case. Results indicate that United States barley imports from Canada would be only slightly reduced, because the rise in U.S. supply is accompanied by a large increase in domestic feed use. While the return of CRP acres to production would have little impact on aggregate trade flows, Canadian producers gain a "free-rider" from United States acreage reductions.

***Wheat Board Control Over Canadian Exports*** The Canadian Wheat Board plays a pivotal role in the Canadian marketing system. As a single-desk seller, the Board can price grain differently to U.S. and offshore markets and so (in principle) maximize returns to Canadian producers. Price discrimination is not a feature of the barley spatial equilibrium model. However, by varying the quantity of barley exported from Canada to the United States, model simulations can be used to study "optimal" allocations from a Canadian perspective.

Results of simulations (Johnson and Wilson, 1995a) suggest that Canadian producer revenue would be maximized with exports to the United States of about 4 mmt—far in excess of the competitive equilibrium identified in the base case. This reflects demand elasticities embedded in the spatial model: U.S. regional markets for feed barley (particularly on the west coast) are highly price elastic, and it "pays" for the Board to absorb a price discount in selling to these markets. This lends credence to claims that the Board has

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<sup>15</sup> The price difference between the non-subsidized (non-EEP) market and the subsidized (EEP) market is constrained to be less than or equal to the EEP bonus.

undersold (in volume) barley to the United States, possibly because of the political sensitivity of these trade flows.<sup>16</sup>

## OPPORTUNITIES FOR RESOLUTION

Disputes over grain trade have numerous commercial policy dimensions. However, in several areas, there seems to be little opportunity for maneuvering or meaningful negotiations. The changes in Canada's WGTA will have major significance for the North American grain market, but are driven by budgetary considerations and the need to comply with GATT restrictions. Similarly, the future of the United States CRP, and other supply control programs, are largely determined by political and budgetary factors that have little to do with this bilateral trade issues.

In evaluating the opportunities for resolving ongoing bilateral disputes, it is important to identify and focus on those policies that are *controllable* (or capable of modification) on each side. The United States controls the size of its EEP program, within budgetary and GATT-imposed limits; given Canadian complaints about the offshore effects of U.S. subsidies, this appears to be one of the most important U.S. policy levers. Canada can control the volume of its grain exports to the United States; indeed, that is central to the August, 1994 agreement on wheat.

We used our spatial equilibrium model to evaluate the extent that room exists for a "cooperative" (negotiated) solution in the case of barley. Could Canada be compensated for reduced United States market access, i.e., by reductions in United States EEP subsidies? Results from several policy simulations within the realm of the controllable policies defined above are shown in Table 2. Specifically, U.S. strategies are limited to the discrete choice of having EEP equal to \$32/mt (the average used for barley), or not (i.e., EEP=0). Canadian export strategies to the United States are either limited to 0, or not limited. These would be executed through use of the export licensing procedures currently used by the CWB. We recognize that this discrete choice is limiting, but our purpose here is to illustrate the difficulties in trying to achieve a cooperative solution.

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<sup>16</sup> There is an important caveat. The Canadian Wheat Board does not control barley sales to domestic feeders in Canada. If prices from domestic, non-Board sales exceed the pooled return from U.S. and offshore sales, then Canadian producers will sell independently. The Board can offer "discounts" to U.S. buyers only if the average price (net of transportation) for U.S. and offshore sales is higher than prices bid by Canadian feeders.

**Table 2. Producer Payoffs<sup>a</sup> under Alternative Policy Scenarios**

	Canadian Exports to the United States	
	<i>Constrained to zero</i>	<i>No limit</i>
EEP = \$0/mt	82.5, 72.2	81.7, 73.2
EEP = \$32/mt	85.6, 70.5	83.4, 73.9

<sup>a</sup> Values in each cell are United States and Canadian average price ( $P^{US}$ ,  $P^C$ ), each in US\$/metric ton under the alternative simulations.

These results can be viewed as strategic choices confronting trade policy negotiators.<sup>17</sup> Of the two strategic choices confronting the United States, the producer payoff is highest when EEP bonuses are \$32. Of the two strategic choices confronting Canada, *No Limit* on exports to the United States is clearly preferred. This is a *dominant* strategy for Canada. The Canadian payoff is highest with \$32 EEP and no U.S. limits on barley imports. In fact, even if EEP were eliminated (EEP=0), there would not be sufficient inducement for Canada to curtail its exports to the United States (i.e., \$73.2 > \$72.2).

These results illustrate why it will likely be difficult to achieve easy reconciliation within the terms of these policy alternatives. Regardless of the value of EEP, it is still optimal (in the sense of raising average prices) for Canada to want to pursue a policy of no limit on sales to the United States.

It should be emphasized that these results are highly dependent on the major factors affecting spatial equilibrium. Most important are the demand elasticities (domestic and off-shore), and the spatial distribution of supply and demand relative to transport costs.

## SUMMARY AND DISCUSSION

This paper discussed effects of differences in marketing and policy mechanisms in the United States and Canada. The discussion distinguished between the effects of differences in marketing policies, and more aggregate policies. General observations are offered in this section on the long-term prospects for North American grain trade.

<sup>17</sup> Of course, elements of the matrix would change under different underlying conditions. Most important would be changes in the WGTA subsidy. The general conclusion would not change in that case, but the differences would be more drastic.

Although the marketing systems in these two countries (including mechanisms related to pricing, transport, handling, and quality control) differ drastically, some convergence should be expected in the long run as a result of movement toward a more open trade environment. Specific observations and concerns about the longer term include:

**Marketing cost differentials.** A natural transition is likely underway which should have the effect of causing marketing costs in the two countries to converge. The rate of convergence largely depends upon marketing policies adopted within Canada. Competition from prairie-border-crossing trade will provide added impetus to reduce marketing costs within Canada.

**Changes in the WGTA.** WGTA reform is underway and will provide apparent relief to some of the trade friction. It is critical for U.S. interests to recognize that changes in the WGTA ultimately will induce a greater flow of grain into the United States. These proposed changes will create a new set of problems as trade shifts to North/South.

In addition, although the WGTA may appear to be removing some of the apparent inequities, there are fundamental differences that will persist. Two important issues which will continue to plague these systems. One is that even at the full WGTA level, rates from the Prairies will still be less than comparable movements from the northern great plains . If everything else were the same, (which, of course, they are not) this would confer a continued advantage to Canadian producers, while institutional restrictions prevent United States producers from shipping in the Canadian marketing system.

The second fundamental issue is the relative flexibility of United States railroads for pricing and car allocation, compared to the proposed changes in Canada. This would not be important except in times of capacity constraints in the Canadian marketing system. United States railroads stand to benefit (in terms of increased movements) from the inflexibility of the Canadian system.

**Price Transparency and Discrimination.** These are innate problems associated with single seller agencies, and in fact are frequently used as a means to legitimize their existence. Problems related to transparency will likely persist so long as the CWB has a monopoly on procurement.

Though it is not our role to suggest means of resolving this apparent Canadian problem, simple solutions could be proposed. One would be for the CWB to regularly offer via a sealed bid auction for sale within North America specified qualities of grain for forward delivery positions. These would only have to be for a small proportion of sales. Reporting of results would not completely eliminate the transparency problem, but would certainly reduce the informational uncertainties that confront participants in this industry.<sup>18</sup>

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<sup>18</sup> It is instructive that the South African Maize Board, which has powers similar to the CWB, has not been burdened with issues related to transparency. The reason for this is likely that as part of their sales regime they hold weekly tenders for forward cargoes for both white and yellow maize. Results are



There are also numerous agricultural and trade policies that exacerbate trade problems and tensions. Trade policy makers, and negotiators on both sides of the border must recognize the effects of these policies. EEP, WGTA, CRP and CWB all have an impact on this problem in unique ways. United States interests must recognize that EEP contributes to the problem, and Canadian interests must recognize that EEP is not the sole source of the problem. In the case of barley, even if EEP were removed, Canadian barley would replace U.S. barley in some markets, and both the EEP and supply control programs as conventionally administered provide Canadians with "free-rider" benefits. Canadians must also admit that features of the CWB system provide them with legislated advantages not shared by U.S. trading firms. Ultimately this yields competitive advantages relative to firms operating in more transparent environment.

These problems will likely persist unless some effort is made to coordinate policies. The United States should not unilaterally pursue policies (i.e., acreage controls or export subsidies) without greater coordination and consultation with Canada. Without this coordination, use of such policies by the United States should be reevaluated.

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reported to the trade. Other sales mechanisms are also used to supplement sales of these standardized grades.

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**APPENDIX. OVERVIEW OF THE SPATIAL EQUILIBRIUM MODEL**

A spatial equilibrium model was developed using mathematical programming to analyze potential impacts of marketing system issues on North American barley trade. In the simulation model we seek to analyze impacts of changes in these selected parameters on spatial equilibrium in the North American market for barley, malting barley and malt. The model is described in detail in Johnson and Wilson (1994), and is summarized here only briefly.

The United States and Canada are divided into different producing and consuming regions; export markets for barley and malt are also included. The objective is to maximize the sum of producer and consumer surplus in feed barley markets less the cost of satisfying fixed regional demands for malt. Thus, malt demand is completely inelastic, while feed barley prices and quantities fed (by region) are determined endogenously. Specifically, feed demand equations were developed using least cost feed formulations. Separate equations were developed for each region, state or province representative of their composition of livestock inventories, and price of alternative feeds. These demands are fairly elastic, and were generally more elastic than demands for offshore shipments.

The model does not include storage activities; all barley demand is for current use, either for feed or malt production. By design, conditions of competitive spatial equilibrium are satisfied in the model solution.

Transport and handling costs are based on 1993 truck and rail rates, and handling margins at American and Canadian elevators. For individual origins and destinations, movements by truck, rail, or truck/rail combinations were allowed. Least-cost movements were identified and incorporated in the analysis. In particular, the model allows prairie-border-crossing trade, an alternative to traditional Canadian movements. Inclusion of handling costs in each country, as well as direct shipment to United States shipping stations (implicitly, transshipment points) provides a realistic depiction of the spatial competitive environment that has emerged.

The model is static and treats supplies as fixed (by region), based on recent production history. Although this limits its usefulness for long-range policy analysis, the model does incorporate many essential features of the current competitive situation: detailed information on transportation and handling costs, feed market values in different regions, and United States export subsidies.