Tariffs, Tax Distortions, and Trade Liberalization: Alcoholic Beverages in British Columbia

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The public debate in Canada over the Canada-U.S. Free Trade Agreement (FTA) was dominated not by economists' traditional concerns with interindustry resource allocation, but instead by concern with the fate of particular producers in specific regions of the country. In part this reflected the nature of the political process, but in part it also reflected the importance of special circumstances in determining the effects of trade policy. Since these circumstances are often internal to an industry, they tend to be obscured by the relatively high level of aggregation that is necessary in full-scale general equilibrium policy models. This article, then, examines in more detail the impact of trade liberalization on a specific industry within a particular region.

The alcoholic beverage industry is particularly interesting from several standpoints. First, it has been affected by a wide range of tariff and non-tariff barriers to trade, including tariffs on final

products, a quota on imports of grapes, and discriminatory pricing and listing practices by the government-owned retail outlets in some provinces. Not only have portions of the industry been among the most heavily protected, but when excise taxes are taken into account, the industry as a whole has also been one of the most heavily taxed, even for domestically produced goods. Especially notable is the wide variation in tax rates among the various beverage groups. The result is both an interindustry and an intraindustry tax distortion, which calls into question some of the conventional presumptions about the effects of trade liberalization. The existence of the distortion means that even for a small country removal of restrictions on trade can reduce welfare. Furthermore, in this particular instance the elimination of differential retail markups on domestic and imported beverages can be accomplished either in a way that tends to reduce the distortion in the overall tax structure (lowering all markups to domestic rates), or in a way that increases it (raising all markups to the rates on imports). Although second-best considerations apply, the expectation is that lowering markups will enhance welfare, but raising markups will lower it.

Second, within the industry there is a complicated pattern of demand interdependence, with marked differences in the degree of substitutability and complementarity among product types. Although recent developments—the FTA and the GATT (General Agreement on Tariffs and Trade) ruling against provincial retail practices—directly affect only parts of the industry, it is clear that the overall effect depends very much on the nature of the demand interdependence. Again the internal characteristics of the industry matter.

Third, the industry is notable for the importance placed on it in the debate over the FTA, especially in those regions of the country, principally British Columbia and Ontario, in which wine production is concentrated. The attention given to the fate of grape production was especially surprising. It was frequently cited as part of the reason for Ontario's opposition to the agreement, and in British Columbia the governing party's support for it was blamed for a byelection loss in the affected area. The regional significance of these developments is heightened by the fact that the provinces have been the principal source of protection and the principal recipients of tax revenues generated by the industry.

This article is concerned in particular with the significance of the internal demand and tax structure of the industry for the effects of the liberalization of trade in alcoholic beverages. We use an estimated model of the demand for alcoholic beverages and other goods, first presented in Alley et al. (1991), to construct a computational model of the welfare effects of trade policy on the alcoholic beverage industry

in the province of British Columbia. By estimating a demand system and its associated expenditure function, we have been able to obtain a more complete characterization of demand interdependence and provide more insight into the sources of welfare changes and the role played by tax distortions. This study was limited to British Columbia in part because of the highly regionalized nature of the industry and of policy. Equally significant was the availability of a unique data set for British Columbia, which provided separate data on the consumption and prices of wines by country of origin. The result is a higher degree of commodity disaggregation than in any previous study of the demand for alcoholic beverages and an ability to consider separately the effects of the FTA and the GATT finding.

The GATT panel ruled against provincial policies on beer as well as wine and spirits. Beer is excluded, however, from the various policy scenarios; the focus is only on wine and spirits. This was done in part because the strength of the model lies in its treatment of demand and consumer welfare and not in its treatment of costs and production. In the case of beer, the major issues are those pertaining to the cost differences between small-scale Canadian plants and the larger-scale U.S. plants and the costs of retooling the Canadian breweries. Dealing with these matters would require the introduction of numerous speculative assumptions. A second reason was that beer was exempted from the FTA, and the Canadian response to the GATT finding on beer differed from its response for wine and spirits. Canada did agree to comply by phasing out the markup differentials on wine and spirits but not on beer. The reason given was that discussions were already under way about the reduction of interprovincial barriers to trade in beer (the markup differentials apply to all out-of-province beer), and it was argued that domestic restructuring had to be completed before equivalent access could be considered for foreign beer. While some action is ultimately expected, the nature and timing of the action are not yet clear. These observations also highlight the fact that there will be some difficulty in separating the effects of interprovincial and international trade liberalization for beer.

In this article, a discussion of the various forms of protection and taxation is followed, in turn, by discussions of the policy model, the implications of tax distortions, the empirical implementation of the model, and the results of the policy simulations. The article closes with a few concluding comments.

Background

To understand the effects of trade liberalization on alcoholic beverages, one must understand the mechanisms used to protect them from foreign competition. Of the various restrictions imposed on the importation of alcoholic beverages, tariffs are a very small part (Table 1). The differential markups imposed by the province are the principal issue, and, of these, wine and beer are most affected. Moreover, these markups are imposed on the value of the goods after inclusion of tariffs, excise taxes, and the federal sales tax (which in 1983 was 13 percent for alcoholic beverages versus an average of 10 percent for all goods.) More specifically,

$$\text{consumer price} = (\text{producer price} + \text{tariff} + \text{excise tax}) \qquad (1)$$
$$\times\,(1 + \text{federal sales tax})$$
$$\times\,(1 + \text{provincial markup})$$
$$\times\,(1 + \text{provincial sales tax})$$

The proportions of consumer prices that represent producer prices, total federal taxes, and total provincial taxes and markups are summarized in Table 2 and contrasted with what would be the case for other goods subject only to federal and provincial sales taxes (these were calculated in the manner described below).

The markups have acted as a barrier to both interprovincial and international trade. In British Columbia, as in other provinces, eligibility for the lower rates requires that the goods be manufactured within the province. In addition, the governments of British Columbia and Ontario have sought to protect grape growers, who in the case of British Columbia supplied 94 percent of their crop in 1983 to the local wine industry (see Agriculture Canada 1986). For British Columbia,

TABLE 1 Taxes and Markups on Alcoholic Beverages: British Columbia, 1983

	Tariff	Excise Tax	Proportionate Markups	
	($/liter)	($/liter)	Domestic	Imported
Wine	0.044	0.4216	0.50	1.10
Beer	0.033	0.1821	0.45	0.83
Spirits	0.07175[a]	4.0479	1.15	1.20

Source: A. Anastasopoulos, I. Irvine, and W. A. Sims. 1986. "Free Trade between Canada and the United States in Alcoholic Beverages". Working Paper, Institute of Applied Economic Research, Concordia University, Montreal.
a. Includes bottle tax.

TABLE 2 Percentage Composition of Consumer Prices: British Columbia, 1983

	Wine			Beer	Spirits	Other
	B.C.	U.S.	Other	(average)	(average)	Goods
Provincial tax and markup	37.69	55.50	55.49	35.55	56.79	6.54
Federal tax	17.32	10.99	11.68	17.24	29.55	9.75
Producer price	44.99	33.51	32.83	47.21	13.66	83.71

Source: A. Anastasopoulos, I. Irvine, and W. A. Sims. 1986. "Free Trade between Canada and the United States in Alcoholic Beverages". Working Paper, Institute of Applied Economic Research, Concordia University, Montreal.

this took the form of an import quota, which required wineries to buy 80 percent of their grapes in the province. Apart from the effect this may have had on the quality of the wine, it has added to the cost of wine production. On average between 1981 and 1984, the landed price of grapes imported from the United States was only 56 percent of the domestic price.[1] Since 18 percent of costs are for grapes (Statistics Canada, Census of Manufacturers Detail Enquiry System, 1981-1984), removing the quota would enable wineries to lower their costs by approximately 8 percent. (Not surprisingly, according to the B.C. Ministry of Agriculture, less than six months after the beginning of the FTA, 70 percent of the B.C. acreage in grapes had been removed from production.)

Finally, it has been alleged that British Columbia has discriminated against imported wines by choosing to list wines that are not close substitutes for domestic varieties (both the FTA and the GATT settlement require equal treatment in listing). Although it is difficult to confirm such practices or to assess their effects, the estimated demand model used in the policy simulations below does provide some evidence. In particular, we found that U.S. and other imported wines are more strongly substitutable for each other than either is for B.C. wine. It is possible that such a placement may reflect the inherent properties of the wines, but the differences are so great that it is likely due, in some measure, to the listing practices. (Since the shares of the separate wine categories in overall expenditure are small, the relative size of the Marshallian price elasticities in each row of Table 3 reflect the relative size of the elasticities of substitution.)

1. Based on average California grape prices reported in various issues of *Wines and Vines* and average B.C. grape prices obtained from Statistics Canada (Census of Manufacturers Detail Enquiry System, 1981-1984).

TABLE 3 Marshallian Demand Elasticities

	B.C. Wine	U.S. Wine	Imported Wine	Beer	Spirits
B.C. wine	-0.7642	0.2592	-0.3927	-0.0332	-0.1896
U.S. wine	0.0158	-0.9692	0.1213	-0.0184	0.0120
Imported wine	-0.4033	2.0363	-0.5464	-0.0822	0.0927
Beer	-0.1669	-1.4851	-0.3981	-0.1509	-0.5125
Spirits	-1.0153	1.0530	0.4830	-0.5532	-1.7603
Other goods	2.0619	-1.0022	0.4389	0.7758	2.0954
Income	0.2720	0.1080	0.2938	0.0622	0.2622

Note: Columns are quantities; rows are prices.

Virtually all these policies will be affected by the FTA and GATT ruling. The terms of the FTA specify that tariffs are to be removed on U.S. wine and spirits, which are to be treated equally for markups and listings. It also requires that the grape import quota be removed. The GATT ruling stipulates removal of discriminatory pricing and listing practices. But as noted earlier, the way in which the provincial retail pricing policies will be affected is not entirely clear. The provinces will be required to equalize the markup rates, but it is still an open question as to whether the equalization will occur at the lower domestic rate, the higher foreign rate, or at some point in between.

The Model

What then will be the effects of changes in federal taxes, provincial taxes, and costs of production (changes in the latter arising from removal of the grape quota)? In choosing how to model these changes, we started with the view that the production of alcoholic beverages is a relatively small part of the economy of a province of modest size in a small country. In other words, British Columbia is treated as a small open economy embedded in both world product markets and national factor markets. As such, we suppose not only that world prices are given but also that factor incomes are given. Thus, when there are any changes in policy toward the industry, factors of production can be reallocated without affecting their returns. With the exception of factors specific to the production of particular goods, which to some extent might describe the vineyards of the Okanagan, this seems reasonable. Moreover, this possible exception will be treated separately in the policy discussion.

This assumption enables us to construct a simple computational general equilibrium model that has many of the features of partial equilibrium analysis but at the same time allows us to look more

closely at how the industry fits into the overall tax structure of the economy. Specifically, we are able to recognize the distortions arising from the exceedingly high rates of taxation affecting the industry as a whole. These rates vary considerably, however—from approximately 110 percent for beer to 615 percent for spirits, with the various wine categories in between (see Table 1).

On the demand side, the utility function of a representative consumer is used to derive a system of demand functions for three categories of wine (B.C., U.S., and other imported wines), spirits, beer, and other goods. For this purpose, we chose the Almost Ideal Demand System model of Deaton and Muellbauer (1980), and the results from estimation of the demand system were used to obtain an explicit expression for the equivalent variation as a measure of welfare changes. As for the demand system itself, the price and income elasticities reported in Table 3 are similar to those obtained in other studies of the demand for alcoholic beverages (although no other study has broken wines down by country of origin).[2] In particular, as in several other studies we found a rather complicated pattern of intragroup substitutability with many instances of complementarity. Although the demand system is discussed in greater detail elsewhere (see Alley et al. 1991), it is worthwhile pointing out that such instances of intragroup complementarity are not surprising and can be explained in much the same way as factor complementarities in applied production analysis—see Berndt and Wood (1979) for a discussion of input complementarities and Alley et al. (1991) for a discussion of the application of the Berndt-Wood argument to consumer demand.[3] In this the first study to estimate an alcohol demand system using monthly, not annual, data, we were able to take into account the marked seasonal variations in the composition of demand and, in that context, it is quite evident that each beverage has its particular place in buyer consumption, with only limited substitutability among them. This is true not only for the

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2. Because the demand system was estimated using monthly data (April 1981-August 1986), the influences of structural and taste shifts were mitigated. In addition to prices and income, demands were expressed as functions of monthly dummies (to account for seasonal demand shifts) and of a variable representing the number of business days in each month—for surveys of other demand studies see Alley et al. (1991) and Ornstein (1981). Although the results of individual studies differ, from his survey Ornstein concluded that the elasticity for beer is quite small and for spirits is approximately unitary. This is roughly consistent with the results of Table 3.

3. Because each of the beverage groups occupies a small share of consumer budgets, the Marshallian elasticities reported in Table 3 provide good approximations of the Hicksian elasticities. Given the formal equivalence between the expenditure minimization problem in consumer theory and the cost minimization problem in producer theory, the Berndt-Wood argument can be applied to explain the results in Table 3. For evidence on the occurrence of complementarities among alcoholic beverages, see Heien and Pompelli (1989), as well as the surveys mentioned in note 2.

broad categories of wine, beer, and spirits, but also for the component parts of the wine category (for example, there is a marked increase in the consumption of non-U.S. imported wine in December). The use of aggregated annual data masks this aspect of tastes and misrepresents the nature of demand interdependence, which is important for understanding the indirect effects of policy changes.

Formally, the model consists of a representative consumer with indirect utility function

$$u = v(p,x) \tag{2}$$

and with consumer prices and expenditures being given by

$$p = \bar{p} + t_f + t_p \tag{3}$$

and

$$x = \bar{x} - T \tag{4}$$

where $\bar{p}$ is a vector of producer prices; t_f and t_p are vectors of the federal and provincial taxes (including markups); $\bar{x}$ is initial expenditure on goods and services, and T is a tax variable to be discussed below. Since factor prices and incomes are given, we also treat $\bar{x}$ as given.

On the production side, we suppose that the marginal costs for any single plant depend only on factor prices, which, at least over the relevant range, are independent of the level of output. But plants with different design capacities may have different costs. In particular, the realization of economies of scale through the construction of plants with a larger design capacity, as anticipated in beer production, can be represented by a step reduction in unit costs. For domestically produced goods, we assume that producer prices either equal or are a constant multiple of unit costs and, as a result, that producer prices change in proportion with unit costs. In the case of imported goods, producer prices are treated as given international prices.

We have deliberately chosen to ignore the possible effects of distortions created by differential profit markups (over marginal cost). In part this was done to simplify matters and avoid detailed consideration of the internal distribution of production within various branches of the industry. Given the available data, such an exercise would have necessitated the introduction of numerous speculative assumptions. But more important, we believed that little would be gained. This belief was based on the observation that such differentials are exceedingly small relative to the distortions created by the tax structure and thus of minor importance. For similar reasons, we chose to ignore changes in profits when considering the effects of trade liberalization on incomes.

To complete the model, it is necessary to consider the costs, in the form of foregone services or increases in other taxes, that would arise from lost government revenues. For the sake of simplicity, we suppose that revenues lost from the industry will be made up by changes in other taxes on consumer expenditure (this agrees with the convention in trade models of treating government revenues as being redistributed to consumers and thus of treating any loss in revenue from taxes or tariffs as reductions in expenditure.) Also for the sake of simplicity, we suppose that these taxes are imposed at the same rate on all goods and services and thus can be represented by an equivalent lump sum tax T in (4).

Having said this, we face the problem of deciding whether to include changes in revenue at both levels of government or solely at the provincial level. On the one hand, since this is a model of a small regional economy, it would be appropriate to include only the provincial revenues

$$R_p = t_p\, q(p,x) \tag{5}$$

where $q(p,x)$ is the vector of Marshallian demand functions. Under this interpretation, any changes in federal revenue are seen as small in relation to the federal budget and would be absorbed by it. On the other hand, trade agreements do affect the other provinces, although the nature of the effects differs. In this context it would be reasonable to recognize the changes in federal revenues

$$R_f = t_f\, q(p,x) \tag{6}$$

In the end we chose to adopt the former as our primary case and assume that

$$T + R_p = \text{constant} \tag{7}$$

which ensures that any reduction in provincial revenue from alcoholic beverages is matched by an equal increase in taxes on all other goods. (The changes in federal government revenues are also reported below and can be used by the reader to approximate their inclusion.)

Together (2), (3), (4), (5), and (7) describe the model. But before any discussion of its empirical implementation, some properties of the model must be considered.

Tax Distortions and Policy

In small open economy models of the above type, in the absence of domestic distortions the effects of various combinations of changes in federal taxes and tariffs t_f, provincial taxes and markups t_p, and costs

$\overline{p}$ (from beer rationalization and removal of the grape quota) are those that would be expected: reductions in tariffs or taxes on single goods and reductions in costs result in welfare gains. As noted earlier, however, marked tax distortions are the case here, and these conclusions need not apply.

For changes in taxes, tariffs, or markups, it is a straightforward matter to show that for any change in a provincial tax

$$\frac{\partial u}{\partial (t_p)_j} = \frac{\partial v(p,x)}{\partial x} \frac{[t_p D_{pj} h(p,u)]}{1 - t_p D_x q(p,x)} \qquad (8)$$

where D is the differentiation operator for the subscripted variable, and $h(p,u)$ is the vector of Hicksian demand functions. Barring exceedingly unusual cases (which do not hold for the estimated model), the expression in the denominator of (8) will be positive, and the sign of $\partial u / \partial t_j$ will be the same as the expression in parentheses in the numerator. If the taxes t_p are the same proportion ρ of final goods prices for all goods but j, then the zero degree homogeneity of the Hicksian demand functions in p implies that this expression is equal to

$$[(t_p)_j - \rho\, p_j] \frac{\partial h_j(p,u)}{\partial p_j}$$

which is positive or negative, as good j is taxed at a lower or higher rate than the other goods. This gives rise to the presumption that a reduction in the tariffs, taxes, or markups on goods the province taxes heavily will be beneficial.

But in the present instance, although all alcoholic beverages are taxed at a higher rate than other goods, some are taxed at lower rates than others. Moreover, if tax rates are not uniform, then, as indicated by the Hicksian derivatives in (8), the nature of commodity complementarity and substitutability will also matter. This point is of special significance since our estimates, as well as those of others, indicate that the demand for alcoholic beverages is characterized by widespread complementarities. To sort matters out, note that Slutsky symmetry and homogeneity imply that

$$t_p D_{pj} h(p,u) = h_j(p,u) \sum_{i \neq j} \left[\frac{(t_p)_i}{p_i} - \frac{(t_p)_j}{p_j} \right] \frac{p_i}{h_j(p,u)} \frac{\partial h_j(p,u)}{\partial p_i} \qquad (9)$$

Consequently, if the tax rates (relative to those of j) are larger on those goods for which j is a substitute and smaller on those for which it is a complement, then a reduction in provincial taxes on j will exaggerate the tax distortion and lead to a decrease in welfare. Although

there may be a presumption that a reduction in the tax rate on a highly taxed good will improve welfare, that need not be the case.

To assess the nature of the distortions, the value of (9) was calculated for wine and spirits (see the first row of Table 4). At least for small changes about the point of means at which the Hicksian elasticities and the taxes were calculated, these calculations indicate that reductions in tariffs or markups for all alcoholic beverages, except imported wines, will lead to gains. If changes in federal revenues were included in changes in income and (7) were replaced with

$$T + R_p + R_f = \text{constant} \qquad (7')$$

then it would be necessary only to replace t_p with $t = t_p + t_f$ in (8) and (9). The values of (9) with t_p replaced by t_f are reported in the second row of Table 4 and serve to measure the distortion effect of the federal taxes alone. In the case of U.S. wine, reductions in either federal or provincial taxes lead to losses, whereas in the case of other imported wine it is only federal taxes that have this effect. Since one effect of the FTA is to reduce restrictions on imports of U.S. wine, this raises the possibility that, even in the absence of any short-run production effects, there will be a welfare loss.

TABLE 4 The Distortion-Ridden Local Tax Effects

| | Wine | | | |
| | British | United | | |
Model with	Columbia	States	Other	Spirits
Equation (7)	-0.811	0.018	-0.100	-1.153
Equation (7')	-0.229	0.004	0.014	-0.441

Note: The figures shown are the values of the expression in brackets in the numerator of (8).

To see how the earlier discussion of welfare losses applies in this particular case, note that numerical values can be attached to the terms in (9) by referring to the tax rates in Table 2 and the demand elasticities in Table 3. (Since the expenditure shares on the individual alcoholic beverages are small, the Marshallian elasticities are good approximations of the Hicksian elasticities for those goods. For the "other goods" category whose share is very large, the Hicksian elasticities can be approximated by the sum of the Marshallian price and income elasticities.) Taking U.S. wine as a case in point, for beer, spirits, and other goods there is either a substitute with a higher tax rate or a complement with a lower tax rate, all of which contribute to the welfare loss associated with lower taxes on U.S. wine. Only in the case of B.C. wine does the combination of lower tax rates and substi-

tutability contribute to a potential gain and, as depicted by the results in Table 4, it is not sufficient to offset the other effects.

The FTA also requires that restrictions on spirits imports and the grape quota be removed. As discussed above, removal of the grape quota will be treated as a cost reduction that leads to a lower producer price. The local welfare effects will then be given by

$$\frac{\partial u}{\partial p_j} = \frac{\partial v(p,x)}{\partial x} \frac{[-q_j(p,x) + t_p D_{pj} h(p,u)]}{1 - t_p D_x q(p,x)} \tag{10}$$

which is also the expression for $\partial u / \partial (t_t)_j$ under (7). In the absence of distortions ($t_p = \rho \bar{p}$ and $p = [1 + \rho]\bar{p}$), the zero degree homogeneity of the Hicksian demands implies that $t_p D_p h(p,u) = 0$, and, as expected, a cost reduction implies a welfare improvement. Although the existence of the distortion might alter this result, here we are concerned only with cost reductions in the B.C. wine industry. In both cases, it is evident from Table 4 that (10) is necessarily negative, and this is true whether or not changes in federal revenue affect income. A comparison of (8) and (10) makes it clear that a reduction in price from a lowering of cost will have a greater effect than one stemming from a tax decrease. What remains at issue is whether these conclusions hold globally as well as locally, what the absolute magnitudes are, and what the net effects of various policy combinations are.

Empirical Implementation

The following scenarios are used to deal with the various aspects of the FTA, the GATT settlement, and the possible policy responses to them:

I.   FTA: Markups on U.S. wine and spirits reduced to domestic rates, tariffs on U.S. wine and spirits removed, grape import quotas removed
     I.A.   Tariffs and markups on U.S. wine
     I.B.   Tariffs and markups on U.S. wine; grape quota
     I.C.   Tariffs and markups on U.S. wine and spirits; grape quota
II. GATT, Low Markups: Scenario I.C. plus the markups on all imported wine and spirits lowered to the rates for domestic beverages
     II.A.   Wine only
     II.B.   Both wine and spirits
III. GATT, High Markups: Scenario I.C. plus the markups on domestic and U.S. wine and spirits raised to the rates for other imported beverages

     III.A.   Wine only
     III.B.   Both wine and spirits

As indicated, scenarios II and III embody the provisions of the FTA scenario as well as the particular way in which the provincial government chooses to equalize markups under the terms of the GATT settlement.

Representation of these scenarios required estimation of consumer and producer prices in each instance. For Canadian, U.S., and other imported wine, we took the mean of the observed prices and used equation (1) and the initial values of the various taxes and markups cited earlier to arrive at the producer prices. With these in hand the process was reversed to arrive at the retail prices for each scenario. In the case of spirits, our data do not distinguish between countries of origin, and we supposed simply that the various types of spirits are differentiated but have a common producer price in all countries. From a knowledge of the respective market shares, taxes, and markups, we used the average retail prices to arrive at the separate consumer prices and common producer prices of the various types of spirits. Assuming that their respective market shares were constant, we then obtained values for the spirits price index under each scenario. Since the markup differential and tariff account for relatively little of the final price, none of the scenarios entails a marked change in the relative spirits prices, and we felt this provided a reasonable approximation.

For each of the scenarios, the calculated prices and tax components as well as the estimated model were used to arrive at values for the changes in welfare, federal and provincial revenues, and demands for each of the commodity categories. We took the means of the sample as the initial values and calibrated the model by altering the intercepts to ensure that the mean values of the prices, income, number of business days, and monthly dummies yielded the mean expenditure shares.

The Policy Simulations

Table 5 presents the results of the simulations for each of the scenarios. The changes in federal and provincial revenues, in conjunction with the equivalent variation (EV), provide a means for approximating the welfare effects if changes in government revenue are ignored completely (EV – provincial revenue) and the effects if changes in both federal and provincial revenues affect disposable income (EV + federal revenue). Although not exact, these approximations are accurate to within 5 percent of the results obtained from exact simulations. The remaining entries describe the percentage changes in demand for each of the goods. In all instances, the figures present departures from the

TABLE 5 Policy Simulations, Scenarios I-III

	I. FTA			II. GATT, Low Markups		III. GATT, High Markups	
	A.	B.	C.	A.	B.	A.	B.
Changes in Welfare (million $/year)							
Equiv. variation	-1.532	8.673	9.091	14.746	17.719	-23.997	-32.939
Changes in Government Revenue (million $/year)							
Provincial revenue	-3.447	- 0.884	0.971	-22.038	-22.014	0.628	-0.822
Federal revenue	-0.435	1.805	1.932	1.038	2.370	-9.034	-12.935
Percentage Change in Quantity Demanded							
B.C. wine	- 0.558	4.650	4.725	19.877	20.481	-18.792	-20.090
U.S. wine	40.480	38.041	37.939	-62.843	-63.668	8.401	10.168
Other wine	- 4.258	- 1.623	- 1.656	17.146	16.767	-10.754	- 9.947
Beer	0.645	0.869	0.908	3.807	4.115	- 0.867	- 1.795
Spirits	- 0.424	0.850	0.972	- 2.311	- 1.339	- 5.126	- 7.955
Other goods	0.000	- 0.012	- 0.013	- 0.063	- 0.074	0.112	0.144

situation given by the mean of our sample. In addition, given the way in which the scenarios were constructed, as one moves from left to right within scenario I and from scenario I to scenario II, the effects of the policy changes are cumulative. In these instances, the separate effect of a particular policy can be approximated by subtracting the appropriate figure to the left. For example, the separate effect of meeting the GATT requirements by lowering the imported wine markups to the domestic level can be approximated by taking an entry in column II.A. and subtracting the corresponding entry in column I.C. Scenario III provides an alternative way of complying with the FTA and GATT settlement. In that scenario, the markups on B.C. wine and spirits are raised to levels on U.S. and other imported wine and spirits. While III.B. is cumulative of III.A., both are separate from scenarios I and II.

Recall also the earlier discussion of the treatment of changes in government revenue. The equivalent variation measures were constructed by including not only the price changes associated with each scenario, but also income changes equal in magnitude to the change in provincial revenues from alcohol (this is the lump sum tax used to represent the changes in services or other taxes associated with the change in government revenues). Because most of the results are self-explanatory, the discussion that follows will concentrate on the highlights.

In light of the earlier discussion of tax distortions, it is not surprising to find that the removal of the tariff and the reduction of the

markup on U.S. wine lead to a welfare loss. The welfare loss is offset, however, by removal of the grape import quota. This is interesting, especially when one considers the impact that the removal of the grape quota had on the debate over the FTA. To place this result in context, we estimate that the total expenditure on B.C. grapes by the B.C. wineries (which accounted for 94 percent of B.C. grape sales) was only $6.3 million in 1983. The annual net gain from the removal of the quota (EV I.B. - EV I.A.) is very close to that amount and would have justified paying for the crop and destroying it in exchange for removal of the quota.[4] It is also interesting to note the modest increases in demand under scenarios I.B. and I.C. for all domestically produced alcoholic beverages, which suggests that the FTA will have little short-run production effect.

For the GATT settlement, note the marked difference between the two compliance strategies. On the one hand, lowering all markups to domestic levels offers consumers a gain that roughly matches that from the FTA (EV II.B - EV I.C. versus EV I.C.) but subjects the provincial government to a significant loss of revenue. On the other hand, raising all markups to foreign levels would maintain provincial revenue but at the cost of a significant loss in consumer welfare. Underlying this trade-off are the expected effects of the markups on government revenue and the consequences of accentuating distortions by raising taxes on goods that are already very highly taxed.

Scenarios II and III also differ in terms of their implications for the composition of consumer demand and the consequences of that for adjustment. In particular, if markups on other imported wine are lowered to domestic rates (compare columns II.A and I.C.), then the principal adjustment will be borne by U.S. wines. But if domestic markups are raised to foreign levels (compare III.A. and I.C.), B.C. wine will be most affected. This reflects the earlier observation that other imported wine is a strong substitute for U.S. wine. In addition to creating a welfare loss for consumers, scenario III will also impose a burden on domestic producers of wine. U.S. producers of wine benefit from the substitution between U.S. wine and B.C. wine. One further observation is that (as one would expect) the lowering of markups under scenario II leads to a shift in favour of alcoholic consumption as a whole and away from other goods, as indicated by the negative effect on consumption of other goods. The raising of markups under scenario III results in a shift in the opposite direction.

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4. This ignores, of course, any possible alternative uses of the resources in grape production. To the extent that such uses exist, it is not necessary for the gain from removal of the quota to match the value of the crop.

In all of the scenarios, the most significant effects occur as a result of changes in the tariffs and markups on wine rather than on spirits, which is not surprising in light of the low levels of protection given to spirits (see Tables 1 and 2). Finally, as for the effects on government revenues, it is worth noting that there is a difference in the fiscal interests of the two levels of government, especially in comparing the different ways in which the province can comply with the GATT settlement. In both III.A. and III.B., provincial revenue is maintained while the federal government loses, the latter occurring as a result of the decrease in demand for beer and spirits, which are the beverages most heavily taxed federally (see Table 2). Under scenarios II.A. and II.B, the opposite is true.

Conclusion

From the above it is apparent that implications of freer trade in alcoholic beverages cannot be separated from the nature of domestic tax policy and the jurisdictions of the policy makers. The FTA and the provisions of the GATT settlement as they affect wine and spirits both offer the opportunity for a net gain. Whether that gain is realized depends on the nature of the response by the provincial governments. If they act to maintain their revenues by increasing markups to the pre-existing levels for imported beverages, then everyone else loses—consumers, domestic producers, and the federal government. An intermediate case, with the common markups lying somewhere between the previous domestic and import levels would distribute the effects more evenly.

Throughout this article, we have ignored the social costs associated with the abuse of alcohol and have treated alcoholic beverages in the same way as any other commodity. To the extent that such costs exist, policies such as that in scenario III which lower the consumption of alcohol have additional merit.

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