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ALCOHOL POLICY
HARMONIZATION
AND TRADE
LIBERALIZATION
IN THE NORDIC
COUNTRIES

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ABSTRACT: In this paper, a partial equilibrium analysis is used to evaluate consequences of a partial alcohol policy harmonization and a trade liberalization in the Nordic countries. The former will reduce alcoholic beverage taxes and the latter will increase imports of alcoholic beverages. The effects on welfare contributed by the alcohol sector depend on three factors: firstly, whether the import restriction is implemented through quota or voluntary import restriction set by the EU; secondly, how a public monopoly producing an externality generating commodity behaves, i.e. is a public firm e.g. welfare or profit maximizer?; and thirdly, whether alcohol taxation in the EU is higher or lower than its Pigovian level in the Nordic countries.

KEYWORDS: Alcohol consumption, tax harmonization, trade liberalization.

JEL classification: 615, 823, 1232.

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TIIVISTELMÄ: Tutkimuksessa tarkastellaan alkoholijuomien verotuksen alentumisen ja alkoholijuomien tuonnin lisääntymisen hyvinvointivaikutuksia pohjoismaissa osittaisen tasapainon analyysia käyttäen. Hyvinvointivaikutukset ovat riippuvaisia kolmesta tekijästä: Ensiksi, säännöstellääkö tuontia kotimaisin tullein vain Euroopan Unionin asettamien vapaaehtoisten vientikiintiöiden avulla? Toiseksi, kuinka julkinen liikelaitos käyttäytyy: maksimoiko se liiketaloudellista monopolivoittoa vai yhteiskunnallsista ylijäämää? Kolmanneksi, mikä on alkoholijuomien verotuksen taso verrattuna alkoholijuomien kulutuksen (marginaalisin) haittavaikutuksiin?

AVAINSANAT: Alkoholin kulutus, veroharmonisointi, tuonnin lisääminen.

JEL classification: 615, 823, 1232.

1. INTRODUCTION

Finland, Norway and Sweden applied for membership in the EU in the early nineties. From the very beginning it was clear that alcohol policy would be one of most difficult matters in the accession discussions. Alcohol policy in the Nordic countries has been characterized by the State alcohol monopolies and high alcohol tax rates. The price levels of alcoholic beverages are significantly higher in Finland, Norway and Sweden than in the EU (see table 1).

The decision to study the effect of EU membership on welfare contributed via the alcohol sector in the Nordic countries is, in the first place, motivated by the assumption that the consumption of alcoholic beverages causes negative externality. The adverse effects of alcohol, which are one of the most important example of the external effects of consumption, are well documented by e.g. Mäkelä et al. (1981). The adverse effects of alcohol can be grouped under two broad headings: firstly, the chronic, mainly somatic consequences of drinking, e.g. ascitic cirrhosis, and secondly, the acute effects resulting from impairment and loss of control due to intoxication, e.g. accidents attributable to drunken driving. One argument in favor of the traditional alcohol policy in the Nordic countries is that chronic somatic hazards are more important in the current EU countries whereas acute effects dominate in the Nordic countries. Since acute effects are probably more important than chronic somatic effects when external effects are considered, alcoholic beverages taxes should be higher in the Nordic countries than in the current EU countries.

A second motivation, in addition to adverse effects of alcohol consumption,

is the fact that alcoholic beverages carry high specific taxes in most industrialized countries. Thirdly, although the value share of alcohol consumption in total private consumption expenditure is relatively low, e.g. about 6 per cent in Finland, the yield from alcohol taxation is about 5 per cent of total government revenue (see table 1).

Table 1: Taxation of alcoholic beverages and alcohol tax revenue (per cent of total tax revenue) in some European countries.

country	tax rates (%)			tax yield (%)
	beer	wine	spirits	
Austria	36	31	42	1.5
Belgium	29	26	65	1.6
Denmark	48	63	78	2.4
Finland*	48	63	78	4.4
France	17	17	42	1.1
Germany	19	12	64	1.5
Ireland	45	48	62	7.4
Italy	26	8	36	0.5
Netherlands	33	22	72	1.3
Norway*	53	57	89	2.4
Portugal	19	14	57	1.5
Spain	13	11	34	1.5
Sweden*	38	68	91	1.6
Switzerland	16	6	36	0.7
U.K.	19	12	64	1.5

Table compiled from Brazeau and Burr (1992). Taxes are calculated using inexpensive and popular brands in each product category.

*Taxes do not account for profits collected by the state monopoly.

In this paper, a partial equilibrium analysis is used to evaluate the effects of the Nordic countries' EU membership on welfare contributed by

the alcohol sector: consumption and production of alcoholic beverages, government revenue from alcohol taxation and external effects of alcohol consumption. The Nordic countries' agreement with the EU will cause alcohol policy harmonization and trade liberalization. According to the Finnish negotiation targets alcohol policy harmonization -reduction of alcohol taxes- and trade liberalization -increase in import quota- are partial. Finnish' authorities will move step-by-step in the direction of a alcohol taxation similar to that in the EU countries and toward free trade. In this paper we are particularly interested in the effects on welfare during the transition period.

Following Eldor and Levin (1990), we first analyze an increase of an import quota set by either a foreign (seller) or a domestic (buyer) country's government (it is considered as a voluntary export restraint, VER, if it is set by the foreign government)¹. Secondly we study the movement of the specific alcohol tax level in a domestic country towards the tax level in a foreign country.

The basic unit of this analysis is the alcohol sector. We consider a public monopoly producing alcoholic beverages in the domestic country.² Alcoholic

¹It may well happen that the EU will agree to restrict its exports voluntarily using VERs, but will not use quotas set by the Nordic countries' governments during the transition period, since the quota rents in the case of VERs are captured by the agents in the EU countries. In the second place, many economists regard the VER as the most rapidly spreading protectionistic instrument in the developed countries.

²The state alcohol company produces (or organizes production via private firms) and distributes alcoholic beverages (except medium light beer) as a monopoly in Finland, Norway and Sweden.

beverage imports from the foreign country are restricted by a quota. The foreign producers are perfectly competitive in the domestic country and the alcoholic beverages are imported in free trade. The rest of the industries in the domestic country are characterized by constant returns to scale and perfect competition.

We show in this paper that the effects of the Nordic countries' EU membership on welfare contributed by the alcohol sector depend on three factors: firstly, whether the import restriction is implemented through quotas or by voluntary import restrictions set by the EU; secondly, how a public monopoly producing an externality generating commodity behaves, i.e. is a firm welfare or profit maximizer?; and thirdly, whether alcohol taxation in the EU is higher or lower than its Pigovian level in the Nordic countries. When the Nordic countries are allowed to set an import quota and to get quota rents and when the alcohol beverage taxes are higher than their Pigovian levels, trade liberalization and policy harmonization increases welfare. While when the EU gets quota rents (in the case of the voluntary export restraint) the welfare effects are ambiguous in general.

This paper is organized as follows: section 2 presents a model, the welfare effects of policy harmonization and trade liberalization are derived in section 3, and section 4 contains concluding remarks.

2. A PUBLIC MONOPOLY IN THE PRESENCE OF EXTERNALITIES

Consider an industry in the domestic country where a public monopoly exists in autarky. The consumption of the commodity creates a negative externality

which is due to the total amount of a measurable physical component of consumption. So the externality depends on the total 'harmful' consumption, defined as $Z = \lambda(X+M)$, where $X+M$ is the total consumption and a parameter λ (assumed to be constant) is the harm content of the commodity. Following Sandmo (1975), we assume that the externality created by consumption is of an "atmospheric" type, so that the utility function of a representative consumer is $v = u(x+m, Z) + f$, where $u(x+m, Z)$ is the utility from the consumption of the externality generating commodity and f is the utility from the consumption of a numeraire composite commodity. Since consumers are assumed to be identical, $x+m = (X+M)/n$, where n is the number of consumers.

Following Holm and Suoniemi (1992), we separate the external effects into two useful categories: financial external costs covered by the public sector $G(Z)$ and non-financial external effects which affect the consumer's utility. The public sector has to cover financial external costs, e.g. costs generated through the Public Health Service and the Social Security System. Nonfinancial external effects include any effects which are not internal to consumer's decision-making.

Due to the public monopoly, we start this section by defining the welfare function in the domestic country. It consists of three parts: firstly, welfare from the consumer's utility and other sectors of the economy,³

³The consumer's utility is assumed to be based on the additive utility function. At an aggregate level it is $U(X+M, Z) + F$, where $U(X+M)$ is utility from the consumption of $(X+M)$, and F is the utility from the consumption of a numeraire good ensuring that the marginal utility of income is equal to 1. The marginal product of labor in the production of X is assumed to be

secondly, welfare from the profits of a monopoly, and thirdly from the government's income and financial external cost. The welfare function is

$$W = U(X+M, Z) - (p+t)(X+M) + \pi + t(X+M) - G(Z) + (p-p^*)M, \quad (1)$$

where p is the producer price and t is the specific commodity tax⁴, and thus $p+t$ is the consumer price of the externality generating commodity, X is the domestic production, M is the quantity of imports of the externality generating commodity, π is the profits of the public monopoly, p^* ($< p$) is producer price in the foreign country, and thus the last term on the RHS of (1) is government revenues from auctioning off the import quota licenses. In the case of a voluntary export restraint (VER) by the foreign country this term does not exist.

The profit function of the monopoly is

$$\pi = p(X+M)X - c(X), \quad (2)$$

where the producer price in the domestic country is given by the inverse demand function $p = p(X+M, t)$ ⁵, where $\partial p / \partial (X+M) \equiv p' < 0$ and

constant, fixing wage rate (ω) and wage bill (ωH), since H is constant. Setting total income equal to total expenditure, the welfare function is as (1) when the constant variables F and ωH are left out.

⁴Note that in the imperfect competition a specific tax has effects which differ from those of an ad valorem tax (see Delipalla and Keen 1992).

⁵Note that a consumption function is $X+M = H(p+t)$ and so $p = H^{-1}(X+M) - t \equiv p(X+M, t)$. Thus $\partial p / \partial (X+M) \equiv p' = \partial(H^{-1}) / \partial (X+M)$ and $\partial p / \partial t \equiv p_t + p' X_t = -1 + [\partial(H^{-1}) / \partial (X+M)] X_t$.

$\partial p/\partial t \equiv p_t + p'X_t$, where $p_t = -1$, and $c(X)$ is the production cost function with $c' > 0$ and $c'' > 0$.

Now we consider how the public monopoly behaves in the presence of externalities. It is far from clear how a public monopoly should behave and how it actually behaves. Therefore, the objective function is assumed to be a weighted average of monopoly profits and the other components of welfare.

$$V = \pi + \alpha(W - \pi), \quad (3)$$

where the parameter α ($0 \leq \alpha \leq 1$) measures how the public monopoly values the other welfare components as its own profits. The first order conditions in the case of import quota licenses auctioned off and in the case of VER by the foreign country are, respectively,

$$\partial V/\partial X = p'X + p - c' + \alpha[\lambda(U_Z - G_Z) + t - p'X] = 0, \quad (4a)$$

$$\partial V/\partial X = p'X + p - c' + \alpha[\lambda(U_Z - G_Z) + t - p'(X+M)] = 0, \quad (4b)$$

where U_Z and $-G_Z$ are the marginal non-financial and the marginal financial damage, respectively. Consequently, domestic production depends on assumptions about the behavior of the public monopoly.⁶ The monopoly rents

⁶We can say further about the behavior of the Finnish State Alcohol company (ALKO). Since the condition (4a) can be rewritten as

$$p\{(1/\epsilon_X)[X/(X+M)]+1\} = -t\{(1/\epsilon_X)[X/(X+M)]+\alpha\} + c' - \alpha\lambda(U_Z - G_Z) + \alpha p'X,$$

where ϵ_X (< 0) is the price elasticity of consumption. The sign of the LHS and the sign of the first term in the RHS follow i) from the empirical observations that $\epsilon_X \approx -0.8$ in Finland (see e.g. Holm and Suoniemi, 1992)

maximizing firm ($\alpha = 0$) produces less than the private marginal cost pricing firm, since it takes into account the effects of its own production on the producer price. When $\alpha > 0$, the public monopoly considers, in addition, three factors: i) the negative effects on the financial and non-financial externalities, ii) the positive effects on government revenue from commodity taxation and iii) the positive effects on the sum of consumer surplus⁷ and government revenue from import tariff. Note, that in the case of VER a government gets no revenue from import tariff.

The comparative static effects of the import quota and commodity tax on the domestic production are $X_t = -\phi_t/\phi_X$ and $X_M = -\phi_M/\phi_X$, where in the case of import quota licenses auctioned off:

$$\phi_X = 2p' + p''X - c'' + \alpha[\lambda(U'_Z - G'_Z) - p' - p''X] < 0, \quad (5a)$$

$$\phi_t = -1 + \alpha \leq 0,$$

$$\phi_M = p' + p''X + \alpha[\lambda(U'_Z - G'_Z) - p''X],$$

and in the case of VER by the foreign country:

$$\phi_X = 2p' + p''X - c'' + \alpha[\lambda(U'_Z - G'_Z) - p' - p''(X+M)] < 0, \quad (5b)$$

$$\phi_t = -1 + \alpha \leq 0,$$

and ii) from the fact that foreign imports can be 'interpreted' to be zero until the Alcohol Act 1994 since ALKO was the only importer and it could price foreign imports according to its own rules. The negative LHS implies the negative RHS. ALKO has thus paid attention to a consumer surplus.

⁷Note, that when a representative consumer maximizes his/her utility, he/she sets $U_x = p+t$ and ignores his/her own marginal contribution to the consumption externality.

$$\phi_M = p' + p''X + \alpha[\lambda(U'_Z - G'_Z) - p' - p''(X+M)],$$

where ϕ refers to the LHS in the first order conditions in (4a) and (4b) and $G'_Z \equiv \partial(G_Z)/\partial X$ and $U'_Z \equiv \partial(U_Z)/\partial X$.

Due to the second order condition $\phi_X < 0$ in both cases. The sign of ϕ_M depends on whether X and M are strategic substitutes or strategic complements (see Bulow et al. 1985). In what follows, we assume that the homogeneous goods are strategic substitutes i.e. $p' + p''X < 0$, implying that in the case of the monopoly rents maximizing firm ($\alpha = 0$) an increase in the import decreases domestic production. In the case of welfare maximizing firm the sign of ϕ_M is more difficult to determine, e.g. in the case of import quota licenses auctioned off $\phi_M < 0$ if and only if $p' + \lambda(U'_Z - G'_Z)$. We assume, however, that $\phi_M < 0$ also in the case of welfare maximizing firm. The effect of the specific commodity tax is unambiguous:

Proposition 1: An increase in the specific tax rate decreases the production of the monopoly rents maximizing firm; whereas it does not affect the behavior of the welfare maximizing firm.

3. WELFARE EFFECTS OF TRADE LIBERALIZATION AND POLICY HARMONIZATION

In this section we consider the effects of partial policy harmonization and trade liberalization on the welfare contributed by the alcohol sector. Alcohol policy harmonization will reduce alcoholic beverage taxes and trade liberalization will increase the imports of alcoholic beverages to the Nordic countries. According to the Finnish negotiation objectives, policy

harmonization and relaxation of import restrictions are partial and industry specific, for which reason we move towards the harmonized policy and free trade step-by-step. Therefore, it is interesting to evaluate the changes in domestic welfare during the transition period. This section is divided into two sub-sections; firstly, the case of a voluntary output export restraint (VER) by the foreign country is studied and secondly, the case of a domestic quota is analyzed.

3.1. A voluntary output export restraint by the foreign country.

The welfare effects can be obtained by differentiating equation (1). Using the first order conditions, the welfare effects of changes in the import quota and in the specific tax can be expressed after some manipulations as

$$\partial W/\partial M = [\lambda(U_Z - G_Z) + t - p'M](X_M + 1) + (p - c')X_M \quad (6a)$$

$$= [\lambda(U_Z - G_Z) + t - p'M][1 + X_M(1 - \alpha)] - p'XX_M(1 - \alpha) \quad (6b)$$

$$\partial W/\partial t = [\lambda(U_Z - G_Z) + t + (p - c') - p'M]X_t + M \quad (7a)$$

$$= [\lambda(U_Z - G_Z) + t - p'(X + M)]X_t(1 - \alpha) + M. \quad (7b)$$

The economic forces at work in the case of trade liberalization can be described in two stages. In the first stage, before the domestic firm adjusts its output, the value of consumer surplus increases by the fall in price (at a rate of p') times consumption. The producer surplus decreases by the fall in price times domestic production. Thus the net welfare effect from the producer and consumer surpluses is the price that the domestic country pays for its import. In addition, a one-unit increase in import quota increases the government revenue from commodity taxation (by an

amount of t) and increases the negative externalities (at a rate of $\lambda(U_Z - G_Z)$). This first-stage effect is independent of the behaviour of the public firm. However, in the second stage, the domestic firm reacts by contracting output so as to maximize its objective function. When the firm is a social welfare maximizer, the welfare effects via changes in domestic output vanish since the public firm takes into account all relevant effects. When, in turn, the firm is a monopoly profit maximizer, changes in domestic output affect externalities, the government's commodity tax revenue, the price that the domestic country pays for its imports, and the producer price and thus the domestic monopoly's profit.

In the first stage, before the domestic firm adjusts its output, a decrease in the specific commodity tax increases the producer price, since the demand function is $p = H^{-1}(X+M)-t$ (see footnote 5), and thus decreasing the consumer surplus (at a rate of $(X+M)$). Since the domestic producer surplus increases (at a rate of X), the welfare reduces (at a rate of M). When the public firm is a monopoly profit maximizer, the commodity tax affects, in addition, domestic welfare via a change in the domestic production since the monopoly reacts to a reduction in the commodity tax by increasing output. This increase in the domestic production i) increases the government's commodity tax revenue (positive effect), since consumers behave according to the rule of $U_X = p+t$; ii) increases the consumption externality (negative effect); iii) increases the firm's profit since the output price is above the marginal cost by the amount $(-p'X)$ due to imperfect competition; and iv) increases the welfare by amount $(-p'M)$ since the consumer surplus increases more than the producer surplus decreases due to reduction in the producer price.

Let us next evaluate the welfare effects of trade liberalization and policy harmonization. Firstly, we assume that the public monopoly maximizes welfare ($\alpha = 1$). Then a reduction of the commodity tax unambiguously decreases welfare, except at autarky, (condition 7b) since it increases the producer price and thus the value of the foreign import. The effects of trade liberalization depend on three factors (condition 6b): On the one hand, an increase in import boosts domestic consumption, 1) rising the negative externality (the external effect), and 2) rising the government tax revenue (the revenue effect). On the other hand, an increase in import decreases the producer price, 3) reducing the price that the domestic country pays for its import (the opposite terms of trade effect). The first effect has a negative contribution to welfare whereas the other two have a positive one; the sufficient condition for the positive welfare effect is thus that the commodity tax is not lower than its Pigovian level, i.e. $t \geq -\lambda(U_Z - G_Z)$.⁸ Thus we have

Proposition 2: Assuming a social welfare maximizing public monopoly producing an externality generating commodity and voluntary export restraint by the foreign country,

- i) a reduction in the commodity tax decreases welfare, except at autarky,
- ii) an increase in import quota increases welfare when the commodity tax is not lower than the marginal externality in the absolute value. When $t < -\lambda(U'_Z - G'_Z)$, the welfare effect of import quota is ambiguous.

⁸Holm and Suoniemi (1992) have shown that the alcoholic beverages taxes are above their Pigovian levels in Finland. Note that the conditions for welfare effects presented in this paper reduce to the conditions analysed by Eldor and Levin, 1990, when $t = -\lambda(U_Z - G_Z)$.

Secondly, we assume that the public monopoly maximizes its own profits ($\alpha = 0$). We should, thus, take into account the welfare effects via the domestic production. An increase in the domestic production, on the one hand, boosts the domestic consumption, increasing the externality and the government tax revenue, and, on the other hand, decreases the producer price, reducing the price that the domestic country pays for its import and reducing the domestic monopoly's profit. Consider, firstly, the case when a change in the domestic consumption has no welfare effects, i.e. when $t = -\lambda(U'_Z - G'_Z)$. In this case, the condition (6a) reduces to similar to that derived by Eldor and Levin (1989), producing the result that the introduction of the "1st unit" of import reduces welfare; otherwise the welfare effects are ambiguous. This follows from, on the one hand, that an increase in import reduces domestic output. Since price is above marginal cost, this constitutes negative welfare effect. On the other hand, an opposite terms of trade effect increases welfare, except at autarky. The condition (7a) produces the result that a decrease in the commodity tax increases welfare via boosting domestic output at autarky, where an opposite terms of trade effect vanishes; otherwise the welfare effects are ambiguous. When the commodity tax is higher (lower) than its Pigovian level, an increase in the domestic consumption, which can be achieved by reducing the commodity tax or by increasing imports, has positive (negative) contribution to domestic welfare.

Proposition 3: Assuming a monopoly rents maximizing public monopoly producing an externality generating commodity and voluntary export restraint by the foreign country, at autarky,

i) a reduction in the commodity tax increases welfare when the commodity tax is not lower than its Pigovian level, and

ii) an increase in the import reduces welfare when the commodity tax is not higher than its Pigovian level.

Finally we assume that the domestic government can keep the commodity tax on its optimal level, i.e. $t = -\lambda(U_Z - G_Z) + p'(X+M) - M/X_t$ (from the condition (7b)). By substituting this into the condition (6b) we obtain

$$\partial W / \partial M = p'X - (M/X_t)(1+X_M). \quad (6c)$$

Since $1+X_M > 0$ and $X_t < 0$, the welfare effects are ambiguous, except at autarky: the higher the import level, the more likely it is that an increase in import improves welfare.

The general observation from the results⁹ is that trade liberalization and policy harmonization have quite ambiguous effects on domestic welfare, independent of the behaviour of the domestic firm. However, so far as the commodity tax is higher than its Pigovian level, an increase in the domestic consumption, following from policy harmonization and trade liberalization, boosts welfare; while if the commodity tax sinks lower than its Pigovian level during the course of transition period, an increase in the domestic consumption decreases welfare.

⁹I agree a referee's suggestion that the simultaneous effects of trade liberalization and policy harmonization should be evaluated. To do so, however, we should calculate $\Delta W = (\partial W / \partial M)\Delta M + (\partial W / \partial t)\Delta t$, where operator Δ describes the change in the magnitude. Unfortunately, it is difficult to evaluate changes in the imports and in the commodity tax, i.e. ΔM and Δt , during the transition period.

3.2. A domestic quota with auctioning off quota licenses.

We analyze the case where the domestic country is small, i.e. p^* is exogenously given. When the government's revenues from auctioning off the quota licenses matter, the welfare effects of import and tax are as

$$\partial W / \partial M = [\lambda(U_Z - G_Z) + t](X_M + 1) + (p - c')X_M + p - p^* \quad (8a)$$

$$= [\lambda(U_Z - G_Z) + t][1 + X_M(1 - \alpha)] + p - p^* - p'X_M(1 - \alpha) \quad (8b)$$

$$\partial W / \partial t = [\lambda(U_Z - G_Z) + t + (p - c')]X_t \quad (9a)$$

$$= [\lambda(U_Z - G_Z) + t - p'X]X_t(1 - \alpha). \quad (9b)$$

The economic forces at work in the case of trade liberalization can be described in two stages. In the stage one, before a domestic firm responds, consumer surplus rises by the fall in price (at a rate of p') times the amount consumed. This equals precisely the fall in government tariff revenue and producer surplus due to price changes. Thus the net effects in this stage are an increase i) in the government tariff revenue by $p - p^*$, ii) in the commodity tax revenue from a marginal increase in import quota, and iii) in the externalities. In the second stage, the domestic monopoly reacts by contracting output. This affects the welfare when the firm maximizes monopoly rents, in that it changes the government's commodity tax revenue, the externalities and the domestic monopoly's profits.

The welfare effects of the commodity tax result only via changes in domestic production. This means that changes in commodity taxation do not matter when a public firm takes into account all relevant welfare effects of its own production. When the firm is a monopoly rent maximizer, the

domestic production affects welfare as described above. The sufficient condition for a reduction in commodity tax increasing welfare is that a commodity tax is not lower than its Pigovian level, i.e. $t \geq -\lambda(U_Z - G_Z)$. A reduction in the specific tax, thus, increases welfare unambiguously when consumption causes no externality at all. When, in turn, the externality effect dominates over the sum of the tax revenue effect and the consumer surplus effect, a reduction in the commodity tax decreases welfare.

To evaluate the welfare effects of import quota, we assume first that the public monopoly maximizes welfare ($\alpha = 1$). Then we see immediately that the welfare effects depend on the difference between the domestic consumer price and the foreign producer price and the marginal externality. When $p+t-p^* > (<) -\lambda(U_Z - G_Z)$, an increase in imports increases (decreases) domestic welfare. When the firm maximizes monopoly profits the effects via change in domestic production have welfare implication. In a special case, where a commodity tax is set at its Pigovian level, any increase in the import quota increases welfare until free trade in the case of monopoly rents maximizing firm as shown by Eldor and Levin (1990), when the following conditions are satisfied: $p'+p''X < 0$, $c'' > p'$ and $p^* \leq c'$. This implies that the condition $t \geq -\lambda(U_Z - G_Z)$ is sufficient for a positive welfare effect of trade liberalization.

We conclude the section by summing up the main results:

Proposition 4: Assume a public monopoly producing an externality generating commodity in a small country and import restriction in the form of quota licenses which are auctioned off.

i) When a public firm takes into account all relevant welfare effects of

its own production, changes in commodity taxation do not matter. An increase in import quota increases (decreases) welfare when the difference between the domestic consumer price and the foreign producer price is higher (lower) than the marginal externality in the absolute value.

ii) When a public firm maximizes monopoly profits, a reduction in commodity tax increases (decreases) welfare when the difference between the domestic consumer price and the marginal production cost is higher (lower) than the marginal externality in the absolute value. The condition $t \geq -\lambda(U_Z - G_Z)$ is sufficient for a positive welfare effect of trade liberalization, when the foreign producer price is lower than the domestic marginal production cost.

Thus, under very general conditions, when the commodity tax is higher than its Pigovian level (as seems to be the case in the Nordic countries), trade liberalization and policy harmonization increases welfare.

4. CONCLUDING REMARKS

In this paper we use a partial equilibrium analysis to evaluate the welfare effects of the Nordic countries' EU membership, which are contributed by the alcohol sector. The Nordic countries' agreement with the EU will probably cause alcohol policy harmonization and trade liberalization. The former will reduce alcoholic beverage taxes and the latter will increase the imports of alcoholic beverages. According to the Finnish negotiation targets, we will move in the direction of the alcohol price level in the EU and toward free trade step-by-step, i.e. the reduction of alcohol taxes and increase in import are partial.

The effects of the Nordic countries' EU membership on the welfare contributed by the alcohol sector depend on three factors: 1) whether the import restriction is implemented through quota or through voluntary import restriction set by the EU; 2) how a public monopoly producing an externality generating commodity behaves, i.e. what its objective function is; 3) whether a commodity tax level is higher or lower than its Pigovian level. When the Nordic countries are allowed to set an import quota and to get quota rents and when the alcohol beverage taxes are higher than their Pigovian levels, trade liberalization and policy harmonization increases welfare. While when the EU gets quota rents (in the case of the voluntary export restraint) the welfare effects are ambiguous in general.

In this paper we have analyzed a specific commodity tax. In fact, taxation of alcoholic beverages in the Nordic countries is based on two components: one is a specific and the other is an ad valorem component. Since, as shown by Delipalla and Keen (1992), the form of taxation matters in the case of imperfect competition, it might be interesting to repeat this analysis by assuming ad valorem taxation instead of specific taxation.

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