

Jose Mendez-Naya and J. Tomas Gomez-Arias

## EXPORT SUBSIDIES AND CUSTOMS UNIONS \*

### ABSTRACT

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This paper explores how the formation of customs unions affects the argument for export subsidies in imperfectly competitive international markets. It is shown that the existence of customs unions may eliminate the incentive for their members to subsidize exports as customs unions grow larger. Therefore, it can be affirmed that regionalism and multilateralism are complementary processes.

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**Jose Mendez-Naya**

*University of A Coruña, Spain*

**J. Tomas Gomez-Arias**

*Saint Mary's College of California, USA*

**Correspondence: J. Tomas Gomez-Arias**

Saint Mary's College of California, Graduate Business, 380 Moraga Rd.,  
Moraga, CA 94575, USA

E-Mail: [tgomez@stmarys-ca.edu](mailto:tgomez@stmarys-ca.edu)

Tel: (+1) 925-631-4928

Fax: (+1) 925-376-6521 / Fax: 0030-2410-613-147

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## INTRODUCTION

According to traditional international trade theory, the domestic interest is served by trade restrictions, which improve domestic terms of trade, but not by export subsidies, which are detrimental to domestic terms of trade. While direct export subsidies are in fact prohibited by the World Trade Organization, many countries in all stages of economic development continue to subsidize their exports indirectly (for example, by affording their firms export credits, export credit insurance, or production subsidies). In many cases, they have been used as an incentive to lure domestic oligopolistic industries into accepting the increase in competition derived from the reduction of trade barriers within either bilateral, regional or multilateral frameworks.

A theoretical rationale for this practice was provided by Brander and Spencer's papers on strategic export subsidies in oligopolistic industrial sectors (Brander and Spencer 1984, 1985). In the latter paper it was shown that when the firms of two countries compete as Cournot duopolists in a third market, a subsidy-promoted increase in a firm's share of that market can increase both its profits (net of the subsidy) and the welfare of that firm's country.

Since Brander and Spencer's papers, a number of studies on the effects of export subsidies in imperfectly competitive contexts have qualified their conclusions. For example, Tanaka (1991) showed that the size of the optimal export subsidy falls as the efficiency of the country increases; Ishikawa and Spencer (1999) that the incentive for subsidies under imperfect competition is weaker for intermediated goods; and Collie (1993, 1997) that the predictions of an infinite export subsidy game favour free trade. Collie later provided a rationale for multilateral agreements prohibiting export subsidies (Collie 2000). Dixit (1984) is a selective review of the literature on imperfect competition in international markets.

For many years now, and especially since the loss of momentum in the Doha round of Negotiations at the WTO, a marked feature of the international trading scene has been growing focus on regional integration, which results in international trade being carried on in a network of regional customs unions\* such as the European Union or MERCOSUR,

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\* In the remainder of this article we will refer to customs unions (CU) as groups of countries that have entirely removed tariffs on goods produced on member countries (they are, therefore, free trade agreements or FTA's) and imposed a common external tariff on a given good. A more general term, preferential trade agreements to PTAs, includes also limited tariff preferences.

free trade areas such as NAFTA and CAFTA-DR and other preferential trade agreements. For an updated survey of the literature on customs unions see Lypsey (2003).

The effect of preferential trade agreements on multilateral trade liberalization has attracted much interest and whether they are a “building block” or a “stumbling block” to multilateral liberalization is an open question Bhagwati (1991) ever since Viner (1950) in his seminal paper established that economic integration had both a (positive) trade promotion and a (negative) trade diversion effect. Some authors, like Feund (2000), argue that multilateral trade liberalization encourages preferential trade liberalization, while others like Krishna (1998) finds that the formation of a preferential trade agreement undermines support for multilateral trade liberalization. Saggi (2006) argues that this result depends on countries characteristics and when countries are asymmetric preferential trade agreements could facilitate multilateral tariff cooperation. For a recent analysis of the empirical research on the effects of U.S. and EU regional initiatives on multilateral trade liberalization see Limao (2006), who concludes that regional integration generally hinders multilateral free trade.

If there is a connection between export subsidies and free trade (Collie 1993; 1997), and free trade seems to progress through regional agreements (over 100 PTA's have been formed since the inception of the WTO), the question arises of what is the impact of export subsidies on regional trade liberalization arrangements and in particular on customs unions. For example, in the case of the European Union, not only have the export subsidy policies of member States been unified, but subsidies have also been generally reduced, in spite of European exporters having argued that this would reduce their competitiveness in foreign markets. In fact, some of the most relevant obstacles in the Doha round of negotiations at the WTO have to do with export subsidies, especially in agricultural products. Does regional integration actually make those export subsidies more desirable thus limiting the appeal of multilateralist approaches to free trade?

In this paper we explore how the formation of a customs union can affect whether export subsidies are desirable or not. This is relevant from a public policy perspective because export subsidies (either direct or under more or less subtle disguises) are often requested by industry leaders in the process of trade liberalization.

We model trade policy as a two-stage game in which export subsidies are set in the first stage and Cournot competition between firms takes place in the second. We show that the formation of a customs union may eliminate the incentive for export subsidies,

and hence that regionalism, like multilateralism, tends to favour free trade. Therefore, the paper complements the debate on regionalism and multilateralism and in terms of Bhagwati (1993) it gives support to the idea that the result of regionalism will be the cooperative scenario or open regionalism.

The remainder of this paper is organized as follows. In Section II we present the basic model, in Section III optimal export subsidies are calculated in the absence of regional agreements, and in Section IV the effects of the formation of a custom's union are explored. Section V concludes.

## THE MODEL

For the sake of simplicity, we consider a single freely trading consuming country that imports a homogeneous good from three producing countries, 1, 2 and 3, each of which has a single firm that produces the good exclusively for the consuming country's market and competes Cournot-wise with the other firms. Fixed production costs are assumed to be zero, marginal costs constant, and there are no plant capacity restrictions. The countries' governments are assumed to know the market structure and that they set export subsidy levels in advance of the firms' quantity decisions. This simple model has proven to be robust under a wide range of assumptions (Ma 2008) and will allow us to bring out the main points of the paper.

The quantity sold by the firm of country  $i$  will be denoted  $q_i$  and the total quantity of the consuming country's market  $q$ , so that  $q = q_1 + q_2 + q_3$ . Consumers' utility functions are assumed to be additively separable and linear in a competitive numeraire good so that, by Roy's identity,

$$\frac{\partial V}{\partial p} = -q \quad (1)$$

where  $V$  is the aggregate indirect utility function and  $p$  is the price of the homogeneous good. It is further assumed that the inverse demand function  $p(q)$  is twice continuously differentiable, with

$$\begin{aligned} p' &= p'(q) < 0 \\ p'' &= p''(q) \geq 0 \\ p' + p'' q_i &< 0 \quad (i=1,2,3) \end{aligned} \quad (2)$$

where primes indicate differentiation with respect to  $q$ . The last of these conditions, which is necessary to ensure the existence and uniqueness of Cournot-Nash equilibrium,

may not be met if the demand function is very convex, but this is regarded as unusual (see, for example, Brander and Spencer (1985) and Brander and Krugman (1983)).

The firms' profits  $\Pi_i$  are given by

$$\Pi_i = (p + s_i - c_i)q_i \quad (i=1, 2, 3) \quad (3)$$

where  $s_i$  is the corresponding export subsidy and  $c_i$  the marginal production costs, and the first-order conditions for Cournot-Nash equilibrium are therefore

$$\frac{\partial \Pi_i}{\partial q_i} = p'q_i + p + s_i - c_i = 0 \quad (4)$$

The dependence of the equilibrium outputs on the export subsidies is most easily obtained by total differentiation of these conditions, which affords

$$\begin{pmatrix} p''q_1 + 2p' & p''q_1 + p' & p''q_1 + p' \\ p''q_2 + p' & p''q_2 + 2p' & p''q_2 + p' \\ p''q_3 + p' & p''q_3 + p' & p''q_3 + 2p' \end{pmatrix} \begin{pmatrix} dq_1 \\ dq_2 \\ dq_3 \end{pmatrix} = \begin{pmatrix} -ds_1 \\ -ds_2 \\ -ds_3 \end{pmatrix} \quad (5)$$

followed by solution of the resulting system, which gives

$$\begin{aligned} dq_1 &= \frac{1}{D} [(p''q_1 + p')(ds_2 + ds_3) - (p''(q_2 + q_3) + 3p')(ds_1)] \\ dq_2 &= \frac{1}{D} [(p''q_2 + p')(ds_1 + ds_3) - (p''(q_1 + q_3) + 3p')(ds_2)] \\ dq_3 &= \frac{1}{D} [(p''q_3 + p')(ds_2 + ds_1) - (p''(q_2 + q_1) + 3p')(ds_3)] \end{aligned} \quad (6)$$

where  $D = p'(p''q + 4p') > 0$  by eqs.2. These relations in turn give the dependence of equilibrium prices on export subsidies, following total differentiation of  $p$ :

$$dp = \frac{\partial p}{\partial q_1} dq_1 + \frac{\partial p}{\partial q_2} dq_2 + \frac{\partial p}{\partial q_3} dq_3 = -\frac{p'^2 (ds_1 + ds_2 + ds_3)}{D} \quad (7)$$

In view of the conditions imposed in eqs.2, eqs.6 and 7 imply that an export subsidy  
*a)* increases the sales of the subsidized firm and reduces those of the other two firms; and  
*b)* lowers the equilibrium price and increases equilibrium market quantity.

## OPTIMAL EXPORT SUBSIDIES IN THE ABSENCE OF CUSTOMS UNIONS

The welfare  $W_i$  of country  $i$  is given by

$$W_i = \Pi_i - s_i q_i \quad (8)$$

so that

$$\frac{\partial W_1}{\partial s_1} = (p - c_1) \frac{\partial q_1}{\partial s_1} + \frac{\partial p}{\partial s_1} q_1 =$$

$$-(1/D)\{(p - c_1)(p''q_2 + p''q_3 + 3p') + (p')^2 q_1\}$$
(9)

with analogous expressions for  $\partial W_2/\partial s_2$  and  $\partial W_3/\partial s_3$ . If country 1 has not yet introduced any export subsidy ( $s_1 = 0$ ), then  $p - c_1 = -p'q_1$  (by eq.4) and

$$\frac{\partial W_1}{\partial s_1} = \frac{p'q_1(p''(q_2 + q_3) + 2p')}{D} > 0$$
(10)

where the inequality follows from eqs.2. Since a country's welfare is monotonously increasing on the size of the export subsidy, country 1 has an incentive to establish an export subsidy, and further analysis shows that, at the Nash equilibrium, export subsidies are strictly positive

$$s_1 = -\frac{p'q_1(p''(q_2 + q_3) + 2p')}{p''(q_2 + q_3) + 3p'} > 0$$
(11)

The analyses for countries 2 and 3 are of course analogous. This section and the previous section thus show that in the absence of customs unions Brander and Spencer's (1985) conclusion that an export subsidy increases domestic welfare by shifting profits from foreign to domestic firms is valid for the model examined here.

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Let us now suppose that countries 1 and 2 form a customs union with a common external commercial policy, so that any export subsidy they set will be common to the two and will be set to maximize the aggregate welfare of the union. If we denote this common subsidy by  $s_U$ , calculations totally analogous to those leading to eqs.6 and 7 in Section II afford

$$dq_1 = \frac{1}{D}[(p''q_1 + p')(ds_3) - (p''(-q_1 + q_2 + q_3) + 2p')(ds_U)]$$

$$dq_2 = \frac{1}{D}[(p''q_2 + p')(ds_3) - (p''(q_1 - q_2 + q_3) + 2p')(ds_U)]$$

$$dq_3 = \frac{1}{D}[(p''q_3 + p')(ds_U) - (p''(q_2 + q_1) + 3p')(ds_3)]$$
(12)

and

$$dp = -\frac{p'^2(2ds_U + ds_3)}{D}$$
(13)

with the same implications as in Section II; in particular, increasing  $s_U$  increases the exports of countries 1 and 2, reduces the exports of country 3, lowers the equilibrium price and increases total market size.

The aggregate welfare of the union,  $W_U$ , is given by

$$W_U = W_1 + W_2 = \Pi_1 + \Pi_2 - s_U(q_1 + q_2) \quad (14)$$

and arguments analogous to those leading to eq.10 show that when  $s_U = 0$ ,

$$\frac{\partial W_U}{\partial s_U} = -p'' p' \frac{(q_1 - q_2)^2 - q_3(q_1 + q_2)}{D} \quad (15)$$

Unlike the right-hand side of eq.10, however, the right-hand side of eq.15 is of indeterminate sign, showing that Brander and Spencer's (1985) conclusion no longer holds in all circumstances. Specifically, if we denote the total output of the union by  $q_U$  and define  $\alpha = |(q_1 - q_2)/(q_1 + q_2)| = |(q_1 - q_2)/q_U|$  (a measure of the internal asymmetry of the union), then  $\partial W_U/\partial s_U$  is positive or negative depending on whether the output ratio  $q_3/q_U$  is less than or greater than  $\alpha^2$  respectively. In other words, the desirability of introducing an export subsidy depends on the relative sizes of the union and its competitor and the internal asymmetry of the union: export subsidies are favourable for very asymmetric unions or unions with an output that is sufficiently smaller than that of their competitor, but unfavourable if the competitor is smaller than  $\alpha^2 q_U$ , in which case the union's optimal strategy is to tax exports. In particular, since  $0 \leq \alpha \leq 1$ , an export subsidy is not desirable if the union is smaller than the third country. Since  $W_U = \pi_1 + \pi_2$  when  $s_U = 0$ , the effect on the optimal subsidy of increasing the third country's output can be traced to  $\partial \pi_i/\partial q_3$  being negative in this situation ( $i = 1, 2$ ), i.e. to the reduction of profits in the union as the competitor country's exports increase. It may also be noted that the more convex the inverse demand curve is, the more sensitive is welfare to export subsidies or taxes; this is because increasing  $p''$  reduces the effect of output changes on equilibrium price, and hence on marginal profit. Particularly, for a linear demand customs union welfare is not sensitive to export subsidies or taxes.

If the union does introduce an export subsidy (or an export tax), further analysis shows that its optimal value is given by

$$s_U = p'' p' \frac{(q_1 - q_2)^2 - q_3(q_1 + q_2)}{2(p'' q_3 + 2p')} \quad (16)$$

which is again positive or negative depending on whether  $q_3/q_U$  is less than or greater than  $\alpha^2$ . Furthermore for linear demand it is verified that  $S_U = 0$  that is, the customs union optimal commercial policy is free trade.

## CONCLUSIONS

For an oligopolistic industry in which the output of producing countries is sold mainly in non-producing countries, the formation of customs unions among the producing countries modifies the desirability of export subsidies (which in the absence of customs unions are supported by Brander and Spencer's well-known profit-shifting argument). Whether an export subsidy is desirable for a customs union depends on its internal asymmetry and the size of its output relative to that of non-member producing countries: export subsidies are favourable for asymmetric, relatively small unions, but unfavourable if the union is larger than its competitors, in which case regionalism favours free trade. The rationale lies in the trade-distorting effects of export subsidies. The larger the relative size of a customs union, the more difficult it is to gain additional market share from markets in third countries to compensate for the cost of the subsidy itself and the lower market prices it brings about. If a subsidy is desirable, its effect on welfare will also depend on the convexity of the inverse demand function and for a linear demand welfare is not sensitive to export subsidies or taxes.

The public policy implications of these results are twofold: first, it shows that large customs unions like the EU can benefit the most from a reduction in export subsidies especially in industries where they have a dominant world market share; second, it suggests that regional integration (at least large regional groups) does support the process toward freer trade by reducing the incentives to subsidize exports. This would support a unilateral reduction in export subsidies in large customs unions even when smaller or less developed countries with small market shares offer limited reciprocity.

At the same time, it is important to highlight that customs unions like the EU and other FTAs and PTAs are typically based on more than pure economic arguments. The EU, for example, is at least as much a political union as a customs union, and MERCOSUR has important political, social and cultural objectives.

## REFERENCES

Bhagwati, J. 1991. *The world trading system at risk*. Princeton, N.J.: Princeton University Press.

- Bhagwati, J. 1993. Regionalism vs. multilateralism: An overview. In J. de Melo and A. Panagarya, editors, *New dimensions in regional integration*. Cambridge: Cambridge University Press.
- Brander, J. and P. Krugman. 1983. Reciprocal dumping model of international trade. *Journal of International Economics* 15: 313-21.
- Brander, J. A. and B. J. Spencer. 1984. Tariff protection and imperfect competition. In H. Kierzkowski, editor, *Monopolistic competition and international trade*. Oxford: Oxford University Press.
- Brander, J. A. and B. J. Spencer, 1985. Export subsidies and international market share rivalry. *Journal of International Economics* 18: 83-100.
- Collie, D. R. 1993. Profit-shifting export subsidies and the sustainability of free trade. *Scottish Journal of Political Economy* 40: 408-419.
- Collie, D. R. 1997. Bilateralism is good: Trade blocs and strategic export subsidies. *Oxford Economic Papers* 49: 504-520.
- Collie, D. R. 2000. A rationale for the wto prohibition of export subsidies: Strategic export subsidies and world welfare. *Open Economies Review* 11: 229-245.
- Dixit, A. K. 1984. International trade policy for oligopolistic industries. *Economic Journal* (suppl.): 1-16.
- Freund, C. 2000. Multilateralism and the endogenous formation of preferential trade agreements. *Journal of International Economics* 52: 359-76.
- Ishikawa, J. and B. Spencer. 1999. Rent-shifting export subsidies with an imported intermediate product. *Journal of International Economics* 48: 199-232.
- Krishna, P. 1998. Regionalism and multilateralism: A political economy approach. *The Quarterly Journal of Economics* 113: 227-214.
- Limao, N. 2006. Preferential trade agreements as stumbling blocks for multilateral trade liberalization: Evidence for the United States. *American Economic Review* 96 (3): 896-914.
- Lipsey, R. G. 2003. The theory of customs unions: A general survey. Economic Analysis of Regional Trading Arrangements, 46-63, Elgar Reference Collection. *International Library of Critical Writings in Economics* vol. 161. Cheltenham, U.K. and Northampton, Mass.: Elgar.
- Ma, J. (2008), Is an export subsidy a robust trade policy recommendation towards a unionized duopoly? *Economics & Politics* 20 (2): 141-155.
- Saggi, K. 2006. Preferential trade agreements and multilateral tariff cooperation. *International Economic Review* 47(1): 29-57.
- Tanaka, Y. 1991. The incentive for export subsidies under imperfect competition. *Open Economies Review* 2: 275-284.
- Viner, J. 1950. The customs union issue. New York: Carnegie Endowment for International Peace.