

Is a Threat of Countervailing Duties Effective in Reducing Illegal Export Subsidies?

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Abstract

The primary objective of this paper is to explore the efficacy of a threat of countervailing measures in reducing illegal export subsidies, by establishing a game-theoretical model to analyze the strategic relationship between exporting and importing countries. Analyzing the strategic incentive for the importing country to respond to export subsidies, this paper provides a rationale for the importing country to impose countervailing measures, thus demonstrating that the importing country increases its countervailing duty on the subsidized imports when the exporting country increases its export subsidies to its exporting firm. Additionally, it is determined that the exporting country's optimal export subsidy rate is zero when the importing country has a right under the WTO to impose any countervailing duty against subsidized imports, thus implying that a threat of countervailing measures is indeed effective.

Keywords: countervailing duties; export subsidies; WTO; strategic trade policy

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I. INTRODUCTION

Since the advent of the World Trade Organization (WTO) in 1995, the order of international trade has been developed to enhance trade liberalization and to regulate trade-distorting practices. After becoming a part of the multilateral trading system, any WTO member country needs to harmonize its trading regime, trade policy, and even industrial policy with the multilaterally agreed-upon disciplines under the WTO. One of the critical changes in this policy set is the prohibition of export subsidies, which had been popular to develop infant industries in most developing countries.

Generally, export subsidies have been understood to exhibit dual aspects. On one hand, countries have sovereignty in providing subsidies to their domestic producers to promote their export performance and economic development, on the basis of their own long-term economic development plan. On the other hand, however, subsidization on exports in a country will lead to distortions of the current international trade pattern - so-called trade distortion effects - by harming the philosophy of fair competition. Therefore, the WTO must establish discipline in regard to export subsidies, taking into consideration these dual aspects of export subsidies.

In fact, these dual aspects were discussed extensively during the Uruguay Round, but the WTO member countries were successful in formulating the *Agreement on Subsidies and Countervailing Measures* (hereafter, the SCM Agreement) in order to regulate trade-distorting subsidies, including export subsidies. As demonstrated in the study of Brander (1995) and Kang (2006), a traditional *prisoner's dilemma* exists in the setup, in which each individual country has an incentive to subsidize its domestic exporters, leading to a reduction in global welfare if every country subsidizes its exporters. Although any international agreement with a strong enforcement scheme is capable of solving this problem, the SCM Agreement has been quite successful in establishing a systemic mechanism for the regulation of trade-distorting subsidies and for eliminating uncertainties surrounding the multilateral trade environment.

The SCM Agreement provides a right to impose countervailing duties (hereafter CVDs) to all WTO member countries. Having understood this provision, it is quite interesting to analyze the efficacy of this right to impose a CVD against exporting countries' incentives to subsidize their exporters. As determined previously by Brander and Spencer (1985) and Brander (1995), it turns out that exporting countries have a very strong incentive to shift the profits of rival companies in importing countries - known as profit-shifting - without any threat of the imposition of a CVD.

However, no studies have yet been conducted to assess the efficacy of CVDs in reducing export subsidies, which is prohibited under the WTO SCM Agreement. Therefore, the principal objective of this study was to provide a theoretical framework by which the efficacy of CVDs might be evaluated.

As we discussed above, there has been relatively little research regarding the efficacy of CVDs in reducing illegal export subsidies. Spencer (1988) previously demonstrated that exporting countries still have profit-shifting incentives for a subsidy, even though the importing country may use countervailing measures to offset this subsidy; put another way, the CVD is not effective in reducing illegal export subsidies. However, Dixit (1988) demonstrated previously that CVDs are *partly* effective in reducing export subsidies, and Qiu (1995) theoretically confirmed that CVDs can reduce subsidizing exporters. Additionally, Qiu (1995) previously provided several reasons to explain the co-existence of export subsidization and the WTO-consistent CVD, even though CVDs are effective in preventing export subsidization; these include delays in retaliation, the WTO constraint on the amount of CVDs, and voluntary export restraints. However, Deardorff (2010) demonstrated previously that CVDs can overcompensate those who request them, making them better off than if the playing field had not been tilted as the result of illegal export subsidies.

As shown above, results concerning the effectiveness of CVDs have been quite mixed and rather controversial, and thus more systemic and comprehensive analyses of this issue are clearly warranted. This paper attempts to address precisely this issue, by establishing a game-theoretical model to analyze the strategic relationship between exporting and importing countries. Analyzing the strategic incentive for the importing country to respond to export subsidies, this paper provides a rationale for the importing country to impose countervailing measures, thus demonstrating that the importing country increases its countervailing duty on the subsidized imports when the exporting country increases its export subsidies to its exporting firm. Additionally, it is determined that the exporting country's optimal export subsidy rate is zero when the importing country has a right under the WTO to impose any countervailing duty against subsidized imports, thus implying that a threat of countervailing measures is indeed effective.

The rest of this paper proceeds as follows. Section II establishes an extended theoretical model with two countries, an exporting country and an importing country, where their firms compete in the market of the importing country in a *Cournot* way. Section III analyzes strategic relationships between firms as well as between governments of the two countries in order to identify their optimal trade policies on CVDs and export subsidies. In addition, given the

results of these analyses, we evaluate efficacy of CVDs in reducing export subsidies and provide implications for the multilateral trading system. And then Section IV concludes.

II. SIMPLE TWO-COUNTRY MODEL WITH EXPORT SUBSIDIES AND CVD

A. Basic Setup

We established a model for the analysis of strategic aspects of export subsidies and CVDs in the framework of the general two-country setup. In our model, there are two countries, an exporting country and an importing country. We also assume that the exporting country has a single exporting firm that receives export subsidies from its government, which is illegal under the WTO SCM Agreement. The importing country has its domestic firm, which competes with the exporting firm in the domestic market of the importing country; we assume that the government of this importing country has the right to impose a CVD, as guaranteed by the WTO SCM Agreement, if the exporting firm has been supported by illegal export subsidies. We also assume that these two firms compete in the market of the importing country in a *Cournot* fashion.

To fulfill the objectives above, this model is predicated on a three-stage game in which firms and governments of both exporting and importing countries play as follows: in the first stage (subsidy stage), the exporting country's government selects an export subsidy rate (s) to support its exporting firm; in the second stage (CVD stage), observing the export subsidy rate of the exporting country, the importing country's government determines its CVD on illegally subsidized imports (t); and in the third stage (Cournot stage), observing both the export subsidy rate of the exporting country and the CVD of the importing country, the firms of these two countries simultaneously determine their output levels (y, y^*).

Under the provisions of the WTO SCM Agreement, any WTO member country has a right to impose a CVD on illegally subsidized imports,¹ under the following two conditions: (1) the existence of an actionable subsidy or an export subsidy; and (2) the existence of injury, or the threat of injury, to the domestic producer. Therefore, the importing country's government must ensure that these two conditions are met prior to the imposition of any CVD. However, we presume that any export subsidy results in injury to the domestic producer in the importing

¹ According to Article 10 of the WTO SCM Agreement, *(m)embers shall take all necessary steps to ensure that the imposition of a countervailing duty on any product of the territory of any Member imported into the territory of another Member is in accordance with the provisions of Article VI of GATT 1994 and the terms of this Agreement.*

country, because Brander and Spencer (1985) previously demonstrated that export subsidies shift profits from foreign rival firms to the exporting firm who receives the subsidies from its government. In that sense, we place the CVD Stage in the second stage before the *Cournot* competition, because the importing country's government becomes aware of injuries to its domestic firm due to export subsidies, without investigating the existence of the injury.

Allow y to represent the sales of the exporting firm in the exporting country and allow y^* to be the sales of the local firm in the importing country. Let the inverse demand function of a homogeneous goods be $p = p(q)$, which we assume to be linear, with $p = a - (y + y^*)$, where $a > 0$.

B. Nash Equilibrium Output Levels of Cournot Competition

Given the basic setup discussed above, this subsection analyzes firms' behaviors in the *Cournot* competition. Therefore, we solve this game to determine the subgame-perfect equilibrium by finding each firm's optimal outcome and subsequently working backward to ascertain the optimal choice for the government.

The exporting firm in the exporting country maximizes its profits in the importing country's market,² given its government's export subsidies and the CVDs imposed by the importing country, as follows:

$$\text{Max } \pi(y; y^*) \equiv R(y; y^*) - (c - s + t)y. \quad (1)$$

$R(y; y^*)$ is the revenue function of the exporting firm in the domestic market of the importing country, implying that $R(y; y^*) = p(y + y^*)y$, $c > 0$ is a constant marginal cost, s is an export subsidy rate from the exporting country's government, and t is a CVD imposed by the importing country's government.

The local firm in the importing country is also maximizing its profits, as follows:

$$\text{Max } \pi^*(y^*; y) \equiv R^*(y^*; y) - cy^*. \quad (2)$$

$R^*(y^*; y)$ is the revenue function of the local firm in the importing country, thereby implying that $R^*(y^*; y) = p(y + y^*)y^*$, $c > 0$ is a constant marginal cost.³

² The exporting firm could serve its domestic market in addition to its exporting one. However, this paper focuses on the market of the importing country for simplicity's sake, as the principal objective of this paper was to verify the efficacy of CVDs.

The Nash equilibrium output levels for the exporting firm and the local firm can be explored via the first- and second-order conditions of each firm's profit maximization problem:⁴

$$y^{NE} = [(a - c) + 2(s - t)]/3 \text{ and } y^{*NE} = [(a - c) - (s - t)]/3. \quad (3)$$

For the Nash equilibrium outputs to have positive values, we assume that the size of the domestic market in the importing country (a) is sufficiently large ($a - c > 0$). Notice that output levels of the exporting firm and the local firm are identical when the exporting country's government provides no export subsidy ($s = 0$) and hence the importing country's government has no reason to impose a CVD ($t = 0$):

$$y^{NE} = y^{*NE} = (a - c)/3 \text{ when } s = 0 \text{ and } t = 0. \quad (4)$$

Using (3), we can also identify the price level and each firm's profits in the Nash equilibrium, as follows:

$$p^{NE} = [a + 2c - (s - t)]/3; \pi^{NE} = [(a - c) + 2(s - t)]^2/9; \text{ and } \pi^{*NE} = [(a - c) - (s - t)]^2/9. \quad (5)$$

The equilibrium outputs and profits shown in (3) and (5) verify the key results reported by Brander and Spencer (1985). Export subsidies of the exporting country increase the output level of its exporting firm, while reducing that of its rival firm in the importing country, by shifting profits from the local firm in the importing country to the exporting firm in the exporting country.

III. OPTIMAL POLICY OF CVDs AND EXPORT SUBSIDIES

A. *Optimal Countervailing Duty*

Let us move to the second stage, wherein the government of the importing country has a right to impose a CVD against illegally subsidized imports from the exporting country. The government of the importing country is supposed to select the optimal countervailing duty in

³ We assume for simplicity's sake that both the exporting firm and the local firm have an identical marginal cost.

⁴ The second-order conditions of these optimization problems are satisfied as follows: $-2 < 0$.

order to maximize its domestic welfare, including profits of the local firm, consumer surplus, and tariff revenue from the CVD, as follows:

$$\text{Max } W^*(t) = \pi^{*NE}(t) + CS(t) + ty^{NE}(t) \quad (6)$$

CS is consumer surplus in the importing country. Given the Nash equilibrium output levels and profits of the two firms from (3) and (5), we can define the consumer surplus of the importing country as follows:

$$CS(t) = [2(a - c) + (s - t)]^2/18 \quad (7)$$

Using (3), (5) and (7), we can rewrite (6) as follows:

$$\text{Max } W^*(t) = [(a - c) - (s - t)]^2/9 + [2(a - c) + (s - t)]^2/18 + t[(a - c) + 2(s - t)]/3. \quad (8)$$

Solving this maximization problem for a CVD, we can derive the following optimal countervailing duty which maximizes the domestic welfare of the importing country: ⁵

$$t^{NE} = [(a - c) + s]/3 \quad (9)$$

Proposition 1 (CVD Response to Export Subsidies)

(1) *The importing country imposes a CVD when the exporting country provides export subsidies to its exporting firm; and (2) the importing country increases its countervailing duty on the subsidized imports when the exporting country's government increases its export subsidies to its exporting firm.*

Proof: For the first argument, we can show that $s > 0 \rightarrow t^{NE} > 0$ because $a - c > 0$. As regards the second argument, by calculating the derivative of (9) with respect to s , we can show that $dt^{NE}/ds = 1/3 > 0$. Q.E.D.

This proposition implies that the size of the countervailing duty against illegally subsidized imports is *directly proportional* to the size of the export subsidies of the exporting government. Theoretically, this result demonstrates that the positive impacts of illegally subsidized imports on the consumer surplus are smaller than the negative impacts on the local firm's profits, even

⁵ The first-order condition is as follows: $[2(a - c) - 2(s - t) + 3(a - c) + 6(s - t) - 6t - 2(a - c) - (s - t)]/9 = 0$. Solving this equation for t , one can attain the optimal CVD. In addition, the second-order condition was satisfied as follows: $-9/9 < 0$.

though the imposition of a CVD provides tariff revenues to the government of the importing country.⁶

This result is also compatible with *practical* circumstances. In practice, the CVD authority of the importing country measures the material injury to the domestic producers due to illegally subsidized imports and then establishes a CVD in order to offset these negative impacts of the illegally subsidized imports. An increase in illegal export subsidies is likely to increase the level of material injury to domestic producers. Therefore, the CVD authority has a strong incentive to raise the CVD in order to offset its negative impacts on domestic producers.

However, the optimal CVD shows that the importing country's government has an incentive to impose a CVD even though the government of the exporting country provides no export subsidy to its exporting firm: $s = 0 \rightarrow t^{NE} > 0$. This implies that the importing country's government has an incentive to alter the strategic relationship between the firms in order to provide benefits to its local firm by imposing an additional tariff on the exports of its rival firm. However, the WTO disciplines regulate this intervention as discussed previously: any WTO member country has a right to impose a CVD only when an exporting country's government provides an export subsidy to its exporting firm. Taking this into consideration, one can determine the optimal and WTO-compatible CVD policy as follows:

Proposition 2 (Optimal and WTO-Compatible CVD Policy)

(1) *The importing country's government imposes no CVD when the exporting country's government does not provide any export subsidy or impose an export tax ($t^{WTO} = 0$ if $s \leq 0$); and (2) the importing country's government imposes the Nash equilibrium CVD, t^{NE} , when the exporting country's government provides export subsidies to its exporting firm ($t^{WTO} = t^{NE} = [(a - c) + s]/3$ if $s > 0$).*

Proof: For the first argument, it can be straightforwardly seen that the importing country is not permitted to impose any CVD when $s \leq 0$. As regards the second argument, as we calculated in (9), the government of the importing country imposes the Nash equilibrium CVD when $s > 0$. Q.E.D.

B. Optimal Export Subsidies in Case of CVD Threats

Now let us move to the first stage, wherein the government of the exporting country makes a decision regarding export subsidies to its exporting firm. It sets the optimal export subsidy rate

⁶ Using (7) and (8), one can demonstrate that export subsidies are positively related to the consumer surplus and tariff revenues of the importing country, while they negatively affect profits of the local firm.

in order to maximize its domestic welfare, its exporting firm's profits less the cost of export subsidies:

$$\square \text{Max } W(s) = \pi^{NE}(s) - sy^{NE}(s) \quad (10)$$

Plugging the optimal CVD from (9) into (10), we can rewrite this maximization problem as follows:

$$\text{Max } W(s) = [(a - c) + 4s]^2/81 - s [(a - c) + 4s]/9 \square \quad (11)$$

Solving this maximization problem for the export subsidy rate, we can derive the following optimal export subsidy rate that maximizes the domestic welfare of the exporting country:

$$s^{NE} = - (a - c)/40 < 0 \quad (12)$$

The sign of this optimal subsidy rate is negative, thus implying an export tax rather than an export subsidy.

Proposition 3 (Optimal Export Subsidy in Case of CVD Threats)

When the importing country's government has a right to impose any CVD against subsidized imports, the exporting country's government has an incentive to impose an export tax.

Proof: The first-order condition of (11) is as follows: $[8(a - c) + 32s - 9(a - c) - 36s - 36s]/81 = 0$. In addition, the second-order condition was satisfied as follows: $(32 - 36 - 36)/81 = -40/81 < 0$. Solving the first-order condition for s , one can attain (12). As is shown in (12), the optimal export subsidy to maximize the domestic welfare of the exporting country is negative. Q.E.D.

As demonstrated in Proposition 1, the government of the importing country has an incentive to introduce countervailing measures against illegally subsidized imports. It turns out that the introduction of countervailing measures by the importing country constitutes a threat to the exporting country, causing it to reduce its export subsidies to its domestic firm, proven in Proposition 3. Therefore, this result of Proposition 3 confirms the efficacy of countervailing measures, because its introduction causes exporting countries to reduce their subsidies to their domestic producers.

c. Optimal Export Subsidies in Case of No CVD Threats

Let us compare the result under a threat of CVDs with outcomes under the situation where the importing country has no right to impose a CVD. When the importing country is not allowed to impose a CVD, the theoretical setup to analyze this situation is different from the previous one by eliminating the second-stage in the previous setup and constructing only two stages. Therefore, the exporting country will make a decision of export subsidies and then the exporting firm and the local firm will compete in a *Cournot* way after realizing export subsidies.

In the second stage, the exporting firm in the exporting country maximizes its profits in the importing country's market, given its government's export subsidies, as follows:

$$\text{Max } \pi(y; y^*) \equiv R(y; y^*) - (c - s)y. \quad (13)$$

The local firm in the importing country is also maximizing its profits, and hence its maximization problem is identical to (2). Solving these maximization problems in case of no CVD threats, one can find the Nash equilibrium output levels for the exporting firm and the local firm:

$$y^{NE}(t = 0) = [(a - c) + 2s]/3 \text{ and } y^{*NE}(t = 0) = [(a - c) - s]/3. \quad (14)$$

Using (14), we can also identify the price level and each firm's profits in the Nash equilibrium without CVD threats from the importing country as follows:

$$p^{NE} = [a + 2c - s]/3; \pi^{NE} = [(a - c) + 2s]^2/9; \text{ and } \pi^{*NE} = [(a - c) - s]^2/9. \quad (15)$$

Following the previous analysis, let us move to the first stage, wherein the government of the exporting country makes a decision regarding export subsidies to its exporting firm. The welfare-maximization problem for the exporting country is analogous to (10), but instead of (11) one can have a following equation, by plugging (14) and (15) into (10):

$$\text{Max } W(s; t = 0) = [(a - c) + 2s]^2/9 - s[(a - c) + 2s]/3 \quad (16)$$

Solving this maximization problem for the export subsidy rate, we can derive the following optimal export subsidy rate that maximizes the domestic welfare of the exporting country:

$$s^{NE}(t = 0) = (a - c)/4 > 0 \quad (17)$$

Without the introduction of countervailing measures, the exporting country has an incentive to provide export subsidies to its domestic firm as a tool of profit-shifting from the local firm in the importing country to its subsidy-recipient firm in a duopoly setup, as was demonstrated in the study of Spencer and Brander (1983). In the previous section with a threat of CVDs, however, the importing country can respond to the illegal subsidies of the exporting country by introducing countervailing measures, which is a privileged right of WTO member countries under the WTO Agreement on Subsidies and Countervailing Measures.

D. Optimal Export Subsidy Policy under the WTO

In Section D, we just analyzed optimal export subsidies in case of CVD threats, while exploring them in case of no CVD threats in Section E. Considering these cases together, one can draw welfare contours over export subsidies as shown in [Figure 1]. As discussed previously, WTO member countries do have a right to impose a CVD if the exporting country provides exports subsidies, which are illegal under the WTO SCM Agreement, and they have injuries to domestic producers in the importing country. Therefore, if the exporting country provides illegal export subsidies to its exporters, the importing country is very likely to impose a CVD and its optimal CVD is positive as shown in (9) and Proposition 1. As discussed in Section E, however, the exporting country has a strong incentive to provide export subsidies to its exporters when the importing is not allowed to impose a CVD. Summing these two cases, one can conclude that the welfare contour of the exporting country is the upper part of $W(t > 0)$ and $W(t = 0)$ but $W(t > 0)$ when its export subsidies are positive ($s > 0$) because the importing country will impose a CVD ($t > 0$) against illegally subsidized imports. In that sense, the welfare contour of the exporting country over its export subsidies is ABW_2W_4C as shown in [Figure 1].

Insert [Figure 1] here.

Proposition 4 (Optimal Export Subsidy under the WTO)

The optimal export subsidy rate under the WTO is zero.

Proof: From [Figure 1], one can show that the exporting country's welfare is higher when the export subsidy is zero ($W_2 = (a - c)^2/9$) than that in case of a CVD threat ($W_3 = (a - c)^2/80$). Therefore, the exporting country's optimal export subsidy is zero. Q.E.D.

Given this contour, one can easily find that the optimal export subsidy rate under the WTO is zero, as stated in Proposition 4. Under the WTO, if the exporting country does not provide any export subsidy, then the importing country is not allowed to impose a CVD.

This paper contributes to research regarding countervailing measures by confirming the efficacy of countervailing measures to reduce exporting countries' illegal export subsidies. It is also meaningful in that it provides a theoretical background regarding the efficacy of countervailing measures, such that this model analyzes strategic relations not only between firms but also between the governments of exporting and importing countries.

IV. CONCLUSION

As discussed above, the order of international trade has been developed under the multilateral trading system, on the basis of the relevant WTO protocols. In the process of harmonizing their trading regimes, trade policy, and industrial policy with the multilateral trading system, WTO member countries must comply with WTO disciplines.

There has been no research conducted thus far to analyze the efficacy of CVDs to reduce export subsidies, which is prohibited under the WTO SCM Agreement. This paper provides a theoretical setup for the analysis of the strategic relationships inherent to the activities of exporting and importing countries. Additionally, we explored the incentives of the exporting country's government to provide export subsidies to its domestic exporters. As demonstrated previously, the existence and magnitude of CVDs from the importing country's government are crucial in assessing the incentive of the exporting country's government to provide export subsidies.

In this paper, we demonstrated theoretically that the importing country has an incentive to impose a CVD when the exporting country provides export subsidies to its exporters. This result provides a theoretical background to WTO member countries' privileged rights to impose a CVD against illegally subsidized imports in order to offset their negative impacts on domestic producers. In addition, we found that the size of a CVD is *proportional* to the size of export subsidies, implying that the CVD authority has a strong incentive to raise the CVD in order to offset the negative impacts of illegally subsidized imports on domestic producers.

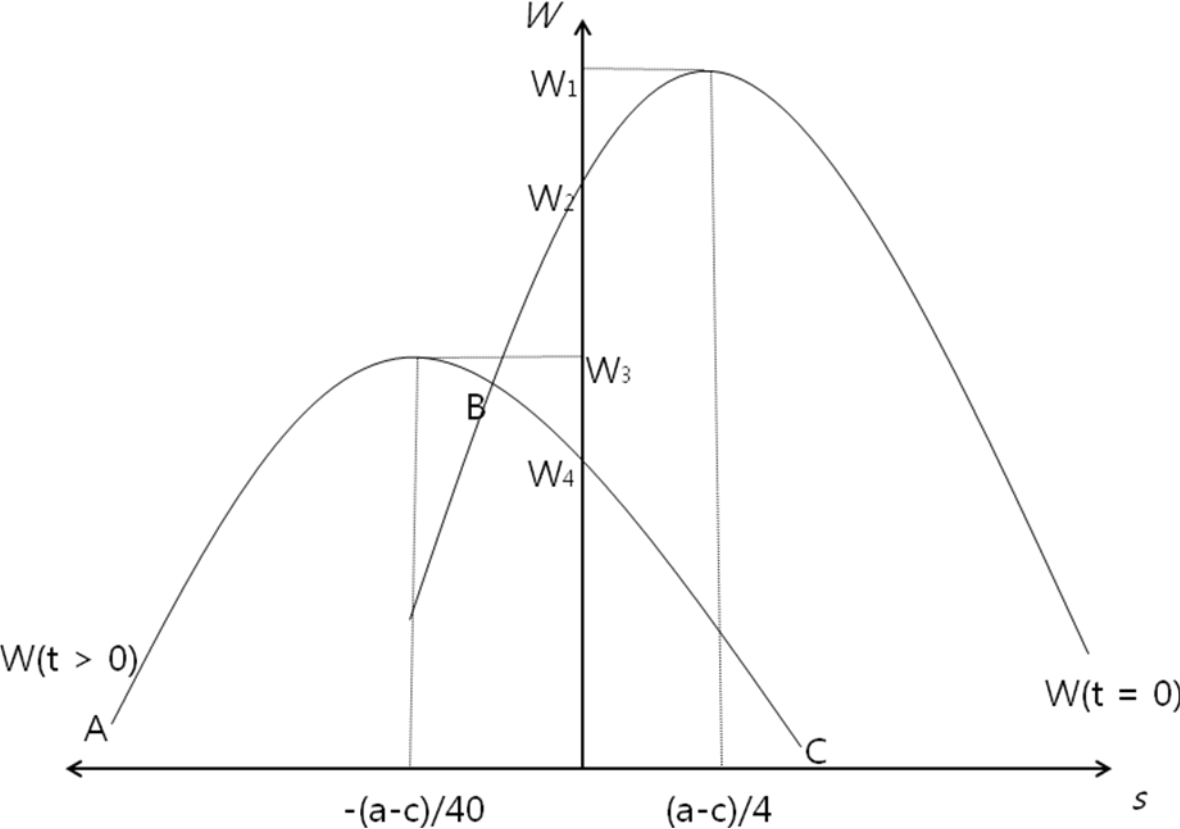
From the perspective of the exporting country, we found that the exporting country has no incentive to provide export subsidies when the importing country has a right to impose a CVD

under the WTO. This result implies that the WTO code and disciplines on subsidies and countervailing measures are effective to reduce, or even eliminate, export subsidies, theoretically supporting the multilateral trading system, aiming at trade liberalization and regulating trade-distorting trade practices.

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[Figure 1] Welfare Contours of the Importing Country over Export Subsidies



Note: $W_1 = (a - c)^2/8$; $W_2 = (a - c)^2/9$; $W_3 = (a - c)^2/80$; and $W_4 = (a - c)^2/81$.