

# The Puzzle of Simultaneous Anti-dumping and Anti-subsidy Measures

*Jørgen Drud Hansen, University of Southern Denmark*

*Jørgen Ulf-Møller Nielsen, Aarhus University*

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## Abstract:

*Quite frequently an anti-subsidy investigation in the EU is paired with an anti-dumping investigation against the same non-EU producers. The final outcome may be a two-component duty where one duty addresses the ‘unfairness’ of the subsidy and the other the dumping behavior. The procedure may be a surprise, as the same total level of protection may be obtained by using the anti-dumping procedure exclusively. When calculating the two duties in the EU the outcome depends on whether the subsidies are export subsidies or domestic subsidies and this may also cause surprise. This paper addresses these puzzles in a theoretical analysis based on a duopoly model for a differentiated product. We argue that the procedures of two investigations leading to a two-component duty may be rational because it provides an incentive for the offending country and companies to terminate their ‘unfair’ competition completely and because a parallel investigation may increase the probability of a successful outcome for the petitioners. In contrast, we find that the different assumptions about the effect of export subsidies and domestic production subsidies on the dumping margin in the EU dual anti-subsidy and anti-dumping procedures have no rational foundation in economic theory.*

**Keywords:** Anti-subsidy, anti-dumping; EU; export subsidies, domestic production subsidies; duopoly model.

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## 1. Introduction

In February 2010 the Commission of the European Union (EU) initiated an anti-dumping (AD) case against Chinese producers of coated fine paper.<sup>1</sup> Two months later the European Commission initiated its first anti-subsidy (AS) case against China for the same product and the same producers.<sup>23</sup> Anti-dumping duties (ADD) and anti-subsidy duties or countervailing duties (CVD)<sup>4</sup> are two of the main contingency measures that countries may legally use according to the General Agreement on Tariffs and Trade (GATT, 1994) given some conditions are met. The World Trade Report 2009 (WTO, 2009) provides a detailed analysis of the extent of and the economic rationale for the use of the various contingency measures, but does not discuss the use of simultaneous anti-dumping and anti-subsidy measures, i.e. combined measures imposed on the same market to address unfair competition from a foreign producer who not only practices dumping, but also has received a subsidy. To the best of our knowledge, this issue has, with the exception of Kelly (2008, 2011), been neglected in other parts of the literature on the practice of anti-dumping and anti-subsidy measures in WTO countries. This may be a surprise, as initiations of simultaneous anti-dumping and anti-subsidy cases are quite common in many countries.

The lack of literature on the combined use of anti-subsidy and anti-dumping measures is the main motivation for this paper. The purpose is to provide an economic analysis of the procedures for the simultaneous use of anti-dumping and anti-subsidy measures in the EU. The theoretical framework is a two-country model, where a differentiated good is traded in a duopoly market. The foreign producer may benefit from a subsidy from the foreign government and, moreover, the producer may price discriminate when selling in his home and export markets, respectively. According to the EU procedures the domestic country may open two investigations, which may result in imposing simultaneously an anti-dumping and an anti-subsidy duty. We analyze the effects of such measures in the framework of the duopoly model with Bertrand competition.

The basic principle for the combined use of an anti-subsidy and anti-dumping duty is outlined in Article V(5) in the GATT (1994) Treaty. It states that “*No product shall be subject to both anti-dumping and countervailing duties for the purpose of dealing with one and the same situation arising from dumping or from export subsidization*”. The door is thus open for the use of a two-component duty, but the measures together may not over-compensate the injury. Detailed rules constrain the levels of an anti-dumping duty and an anti-subsidy duty in procedures which should target either a subsidy or a dumping behavior. However, by using an anti-dumping procedure, which addresses only one ‘misbehavior’, it will be possible to impose a duty at the same level as a

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<sup>1</sup>See *Notice of initiation of an anti-dumping proceeding concerning imports of coated fine paper originating in the People's Republic of China* (European Commission, 2010a). On 16 November, 2010 the European Commission imposed a provisional anti-dumping duty on coated fine paper from China (European Commission, 2010c). And on 6 May 2011 the European Council imposed a definitive anti-dumping duty on imports of coated fine paper from China (European Commission, 2011a).

<sup>2</sup>See *Notice of initiation of an anti-subsidy proceeding concerning imports of coated fine paper originating in the People's Republic of China* (European Commission, 2010b). On 6 May 2011 the European Council imposed a definitive anti-subsidy duty on imports of coated fine paper from China (European Commission, 2011b).

<sup>3</sup> In 2007 the US introduced countervailing subsidies together with anti-dumping duties against coated paper from China.

<sup>4</sup> In this paper we use anti-subsidy duties and countervailing duties indiscriminately.

two-component duty that addresses both subsidy and dumping. It is therefore at first glance a puzzle why two investigations should be conducted in case of simultaneous subsidy and dumping.

We make the point in this paper that in contrast to one (anti-dumping) duty only, imposing a two-component duty provides an incentive to the offenders to remove both the subsidy and the dumping behavior. However, the results of the formal analysis of market equilibrium in the duopoly model illustrate that the specific EU procedures for calculating the duties, and not least the composition of the anti-subsidy and anti-dumping duty, is without theoretical foundation. The EU procedure is based on the simple perception that subsidies and duties just translate to prices one to one. This is in general at odds with the results in the duopoly analysis, where the pass-through of subsidies and duties depends on the type of subsidies – export or general production subsidies, the degree of product differentiation and the game between the two producers, i.e. whether they play Cournot or Bertrand. Finally, we argue that due to uncertainties both about the outcome of the investigations, and about the reactions of foreign counterparts, parallel petitions may be preferred for only one investigation.

Our paper differs from Kelly (2008, 2011) in a number of areas. First, our paper is based on a theoretical trade model used to determine the prices and hence the dumping and injury margin for the evaluation of the possibility of double protection. The analyses in the papers by Kelly take the prices as given and on this basis discuss the procedures for imposing anti-dumping duties and countervailing duties. Second, our paper is related to the practice of simultaneous anti-dumping and anti-subsidy measures as used by the European Union, while Kelly primarily focuses on the US practice. Third, in contrast to Kelly our paper addresses the issue of why firms simultaneously petition both anti-dumping and anti-subsidy investigation. Finally, Kelly places a strong emphasis on the special rules that apply to towards non-market economies in the analysis of simultaneous anti-dumping and anti-subsidy measures. Our analysis is limited to the standard case of trade between market economies.

The paper is structured as follows: Section 2 provides some basic information on the use of anti-subsidy and anti-dumping measures for main actors in the world economy. The section also describes the main principles, which, in accordance with the WTO and EU, should be adhered to if anti-subsidy and anti-dumping measures should be implemented. Specific focus will be on the EU practice in parallel anti-dumping and anti-subsidy investigations. Section 3 establishes a theoretical framework to the empirical and institutional description in Section 2. The framework is an international duopoly model based on differentiated products. The model is used in Section 4 for an analysis of the economic theoretical foundation of the EU practice of combined anti-subsidy and anti-dumping duties for domestic production subsidies and export subsidies, respectively. Section 5 concludes.

## 2. The prevalence and procedures of anti-dumping and anti-subsidy cases

In this section we lay the empirical and institutional foundation for the paper by first presenting numbers for the global prevalence of simultaneous anti-dumping and anti-subsidy initiations followed by detailed information on the EU practice in such cases.

### 2.1. The prevalence of simultaneous anti-subsidy and anti-dumping initiations

Even though it is well documented that isolated use of anti-dumping measures is a dominating type of contingency measures (WTO, 2009), anti-subsidy, and simultaneous anti-dumping and anti-subsidy cases are quite common in some countries as shown in *Table 1*.

For all 53 reporting countries in Bown (2010a, 2010b), 54% of all initiated anti-subsidy cases are combined with a parallel anti-dumping case. Even though 7% of all anti-dumping cases are combined with a simultaneous anti-subsidy case, we stress the 54% instead of the 7% since in principle all anti-subsidy cases can be combined with an anti-dumping case, while the reverse is not the case. While the US has 27% of all the initiated anti-dumping and anti-subsidy cases, it has 75% of anti-subsidy cases, and also 76% of the total number of simultaneous anti-dumping and anti-subsidy cases, which makes up 55% of the USA anti-subsidy cases. For the EU the numbers are: 12% of the total number of anti-dumping and anti-subsidy initiations, 8% of the anti-subsidy cases and 10% of the simultaneous anti-dumping and anti-subsidy cases, while the latter makes up 70% of all EU anti-subsidy cases. In the following discussion we will concentrate on the institutional procedure in the EU.

*Table 1. Cumulated number of anti-dumping and anti-subsidy cases in selected countries*

| Reporting country                                 | Number of initiations              |                                    |   | (4)   |
|---|------------------------------------|------------------------------------|---|---|
|   | (1)<br>Anti-dumping<br>exclusively | (2)<br>Anti-subsidy<br>exclusively | (3)<br>Simultaneous*<br>anti-dumping and anti-subsidy | Simultaneous initiations as a percentage<br>of the total number of anti-subsidy<br>initiations [(3)100/((2)+(3))] |
| Australia (1989-2010)                             | 486                                | 3                                  | 10  | 77  |
| Brazil (1988-2010)                                | 261                                | 14                                 | 2   | 13  |
| Canada (1985-2010)                                | 336                                | 6                                  | 30  | 83  |
| China (1997-2010)                                 | 181                                | 1                                  | 3   | 75  |
| EU (1979-2010)                                    | 676                                | 17                                 | 39  | 70  |
| India (1996-2010)                                 | 618                                | 1                                  | 0   | 0   |
| South Korea (1986-2010)                           | 144                                | 0                                  | 0   | -   |
| Mexico (1987-2010)                                | 268                                | 10                                 | 9   | 53  |
| Peru (1992-2010)                                  | 122                                | 14                                 | 1   | 8   |
| South Africa (1993-2010)                          | 289                                | 0                                  | 0   | -   |
| Taiwan (1983-2010)                                | 128                                | 0                                  | 0   | -   |
| Turkey (1989-2010)                                | 235                                | 1                                  | 0   | 0   |
| USA (1979-2010)                                   | 880                                | 247                                | 298   | 55  |
| Other countries** (1991-2010) (different periods) | 551                                | 24                                 | 2   | 8   |
| All countries (different years)                   | 5175                               | 336                                | 394   | 54  |

*Notes:* An observation is the initiation of an AD, AS or AD+AS case, without considering whether the case ends with a measure or not, or whether the case is withdrawn by the complainants before a measure is introduced. For AD, AS, and AS+AD a case (the counting unit) is defined as a product plus an AD and/or AS country as found in Chad Bown (2010a, 2010b). \* A case is classified as a simultaneous anti-dumping and anti-subsidy case, when in Chad Bown (2010a) there is information in the column 'Related\_CVD', or alternatively, when in Chad Bown (2010b) there is information in the column 'Related\_AD'. This means that for a given product and dumping and subsidizing country (a 'case') the anti-dumping investigation and anti-subsidy investigation refer to each other, and if it is concluded that both measures should be implemented, the calculation of the two duties is done simultaneously. \*\*Includes:

Argentina, Bulgaria, Chile, Columbia, Costa Rica, Croatia, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Hungary, Indonesia, Israel, Japan, Jamaica, Jordan, Kyrgyz Republic, Latvia, Lithuania, Malaysia, Moldavia, Morocco, New Zealand, Pakistan, Panama, Paraguay, Philippines, Poland, Slovak Republic, Slovenia, Thailand, Trinidad Tobago, Tunisia, Ukraine, Uruguay, Venezuela, and Vietnam.

Sources: Own calculations based on Bown (2010a) "Global Antidumping Database"; and Bown (2010b) "Global Countervailing Duties Database."

## 2.2. Institutional procedures

Three indicators have a prominent role in the EU decision making process for anti-subsidy and anti-dumping measures: the subsidy margin (*SM*), the dumping margin (*DM*), and the injury margin (*IM*). The *SM* measures the subsidy per produced unit. The subsidy may be paid directly as an amount per produced unit and in such cases *SM* is calculated straightforwardly as the amount received per produced unit. In case the subsidy is granted as a fixed amount or more indirectly as a specific favor to the firm, e.g. tax holidays, the *SM* is assessed by translating the favorable treatment of the firm to an 'equivalent' amount per produced unit, see art. 7(2) in Council Regulation (EC) No. 597/2009. The EU also treats export subsidies and domestic subsidies differently, where the latter refers to subsidies that are given independently of the destination of the produced product.<sup>5</sup> Below, we therefore differentiate between the export subsidy margin *XSM* and the domestic subsidy margin *DSM*.

The *DM* measures the difference between the foreign producer's price when selling in the foreign producer's home market, and the foreign producer's price at firm gate when selling in the export market.<sup>6</sup>

Anti-dumping as well as anti-subsidy measures require, besides dumping and illegal subsidies, 'injury' on the domestic producers. In article 3.1 of the *Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994* it is stated that "A determination of injury [...] shall involve an objective examination of both (a) the volume of the dumped imports and the effect of the dumped imports on prices in the domestic market for like products, and (b) the consequent impact of these imports on domestic producers of such products". And in article 3.2 "[...] With regard to the effect of the dumped imports on prices, the investigating authorities shall consider whether there has been a significant *price-undercutting* by the dumped imports as compared with the price of a like product of the importing Member [...]" (our italics). Many countries, including the EU, use the effect of the dumped imports on prices in the importing market as the prominent indicator of injury. Injury elimination therefore, among other factors, requires price equalization in the importing market (Vandenbussche, 1995; Belderbos et al., 2004).

In case of a subsidy, a countervailing duty (*CVD*) may be imposed if the subsidy has caused 'material injury'. An anti-dumping duty (*ADD*) may similarly be imposed, if the dumping behavior has caused 'material injury'. The size of the *CVD* and the *ADD*, respectively, is in the EU and several other countries (but not the US) constrained by the '*lesser duty rule*', which says that the

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<sup>5</sup> Although, the concept subsidy margin is used in all EU anti-subsidy cases, it is not defined – even mentioned, in the EU anti-subsidy legislation (Council Regulation (EC) No 597 /2009).

<sup>6</sup> This is the main rule for calculating the dumping margin in the GATT and the EU anti-dumping rules, but other possibilities are sometimes used, e.g. when the dumper is treated as a non-market economy like China.

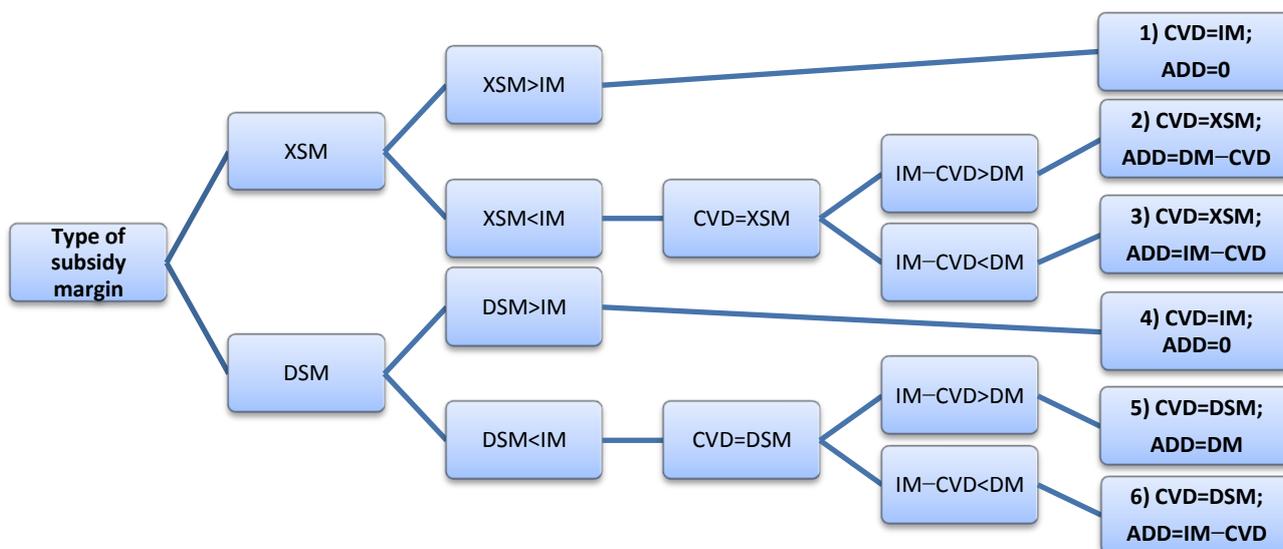
CVD and ADD, respectively, must not exceed the lowest value of the IM, and the SM and DM, respectively.

The assessment of all three measures, SM, DM and IM, may cause a lot of problems, and it may even in many cases be impossible to establish the measurement on a sound foundation of economic theory, but they nevertheless constitute the practitioner’s instrument in the decision making process for policy initiatives.

Based on an investigation of all EU cases with simultaneous anti-dumping and anti-subsidy measures for the period 1996-2010 we have constructed Figure 1 showing how different configurations of SM (XSM, DSM), IM, and DM may lead to simultaneous anti-dumping and countervailing duties in the cases numbered 2, 3, 5, and 6 in the figure.

When ‘unfair’ trade conditions are due to both a subsidy and to dumping, four important factors are decisive for the relative size of anti-dumping and anti-subsidy duties (of which three have already been mentioned above):

Figure 1. The EU procedure for simultaneous imposition of countervailing duties and anti-dumping duties



Source: Own construction based on the EU practice for the period 1996-2010.

(a) The sequence of calculating the measures, according to which the CVD is always calculated before the ADD. (b) The ‘lesser duty rule’, so ADD and CVD, respectively, must not exceed the minimum value of IM, and DM and SM, respectively.<sup>7</sup> According to (a) and (b), the CVD is

<sup>7</sup> In the EU anti-dumping regulation it is said in article 9.4: “The amount of the anti-dumping duty shall not exceed the margin of dumping established but it should be less than the margin if such lesser duty would be adequate to remove the injury to the Community industry”. In the anti-subsidy regulation it is formulated in a similar way as in article 15.1: “The amount of the countervailing duty shall not exceed the amount of countervailable subsidies established, but it should be less than the total amount

determined as the minimum of the *SM* (*XSM* and *DSM*, respectively) and the *IM*. (c) *Ceilings for the size of the combined duties*, respecting the GATT and EU provisions<sup>8</sup> that no product shall be subject to both *ADD* and *CVD* for the purpose of dealing with the same ‘situation’, i.e.  $ADD + CVD \leq IM$ . (d) The *type of subsidy* – export subsidy, or domestic subsidy. For an *export* subsidy an *ADD* is imposed additionally as a residual, which must not exceed the lowest value of the *DM* or *IM*, which are both reduced by the *CVD* calculated in the first round. The logic behind this procedure seems to be that an export subsidy has a price reducing effect on the export price and that it therefore increases the dumping margin. Setting an anti-subsidy and an anti-dumping measure independently in this situation will be to deal doubly with the same issue. Dual anti-subsidy and anti-dumping duties should therefore involve some correction to avoid double protection of the industry. A *domestic* subsidy may e.g. be given both to domestic and export sales with the same amount per unit. But it may e.g. also be given as an investment subsidy. The procedure is the same as for export subsidies, with the exception of the situation in which the injury margin corrected for the countervailing duty is larger than the dumping margin. In this case the anti-dumping duty is equal to the full value of the dumping margin. The philosophy behind the EU practice in the different treatment of an export subsidy and a domestic subsidy is that the latter is assumed not to have an effect on the dumping margin. If the domestic subsidy is given as the same per unit subsidy on all sales, the argument seems to be that it has the same effect on export and domestic prices, so the dumping margin is unchanged.<sup>9</sup> If the domestic subsidy is, e.g. given as an investment subsidy, the argument seems to be that the subsidy does neither affect export prices or the dumping margin.<sup>10</sup> Table 2 illustrates by means of examples the different treatment of an export subsidy (case A), a domestic subsidy (case B), and the more complicated case where both types of subsidies are involved (case C).

Table 2. The different EU treatment of export subsidies and domestic subsidies in simultaneous anti-dumping and anti-subsidy cases

| %      | Injury Margin ( <i>IM</i> ) | Dumping Margin ( <i>DM</i> ) | Export Subsidy Margin ( <i>XSM</i> ) | Domestic Subsidy Margin ( <i>DSM</i> ) | Anti-dumping Duty ( <i>ADD</i> ) | Countervailing Duty ( <i>CVD</i> ) |
|--------|-----------------------------|------------------------------|--------------------------------------|--|----------------------------------|------------------------------------|
| Case A | 50                          | 20                           | 10                                   | -                                      | 10                               | 10                                 |
| Case B | 50                          | 20                           | -                                    | 10                                     | 20                               | 10                                 |
| Case C | 30                          | 30                           | 15                                   | 10                                     | 5                                | 25                                 |

Notes: All cases are based on the assumption that  $IM \geq DM > (XSM, DSM)$ .

Source: European Commission – DG Trade (2005).

Assuming the different margins are measured correctly, we are not able to claim that the EU is performing any ‘double protection’ in the sense that the overall duty exceeds the total level of ‘material injury’. However, it may be noticed from Figure 1 and Table 2 that the relative size of

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of countervailable subsidies if such lesser duty would be adequate to remove the injury to the Community industry”. In the WTO Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade Article 9.1 and in the Agreement on Subsidies and Countervailing Measures Article 19.2. the lesser duty rule is formulated as “desirable”, and not as a requirement.

<sup>8</sup> Council Regulation (EC) No 1225/2009 of 30 November 2009 article 14(1), and Council Regulation (EC) No 597/2009 of July 2009 article 24(1).

<sup>9</sup> See Commission Regulation (EC) No 193/2009 of 11 March 2009 imposing a provisional anti-dumping duty on imports of biodiesel originating in the United States of America

<sup>10</sup> See Commission Regulation (EC) No 1742/2000 of 4 August 2000 imposing a provisional antidumping duty on imports of polyethylene terephthalate (PET) originating in India, Indonesia, Malaysia, Republic of Korea Taiwan and Thailand.

*CVD* and *ADD* respectively depends on the EU procedure and that different levels of protection may result from export and domestic subsidies, respectively. For the same subsidy margin, domestic subsidies may result in a higher level of overall protection compared with the case where export subsidies were used. Given the focus in the GATT Agreement on export subsidies as being especially harmful,<sup>11</sup> this is at first glance surprising.

### 3. The basic model

Figure 1 highlights the four indicators relevant for a simultaneous anti-subsidy and anti-dumping investigation: type of subsidy, subsidy margin, injury margin, and dumping margin. From an economic analytical point of view, the type of subsidy and the subsidy margin are policy determined and, hence, exogenously given, while the injury margin and the dumping margin are endogenously given from the market equilibrium. We assume Bertrand market equilibrium in a home country, where demand is met by production from a domestic producer and a foreign producer, respectively, who sell differentiated products. The foreign producer may receive an export or domestic subsidy, and a duty may be imposed on his export to the home country. We furthermore assume that the home and the foreign markets are segmented, so that price discrimination, and, hence, dumping can take place. In this section we establish and solve the model, leaving the formal analysis of the EU procedures for anti-subsidy and anti-dumping duties to the following section.

The two producers' inverse demand functions in the home market take the form:

$$p = 1 - [q + \lambda q^*] \tag{1a}$$

$$p^* = 1 - [q^* + \lambda q]; \quad 0 \leq \lambda \leq 1 \tag{1b}$$

where  $^*$  indicates the variant produced by the foreign producer. By a suitable choice of units for output the slope of the demand functions are set equal to 1. Also the interception along the price axis is set equal to 1, since we do not intend to analyze the importance of market size. The parameter  $\lambda$  measures the extent of product differentiation. To make our cases relevant for anti-dumping and anti-subsidy policies, the products of the two producers should be 'like', i.e.  $\lambda$  is bounded to be strictly positive. Moreover, price undercutting may only take place for heterogeneous products and hence we only deal with cases where  $\lambda$  is strictly less than 1.

The marginal production costs are exogenously given and specified by  $c$  and  $c^*$ , respectively. We disregard transport costs and only the foreign producer may receive a subsidy or be imposed a duty when exporting. The effective marginal costs of the foreign producer in his export market are thus given by:  $c^* - s + t$ ;  $s = x, d$ ; where  $s$  represents a subsidy (which may be an export subsidy,  $x$ , or a domestic subsidy,  $d$ ) and  $t$  a duty, all per produced unit. Fixed costs are neglected as the analysis

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<sup>11</sup> In GATT (1994) there is a distinction between prohibited subsidies and actionable subsidies: Prohibited subsidies require the recipients to meet certain export targets, or to use domestic goods instead of imported goods. They are prohibited because they are specifically designed to distort international trade, and are therefore likely to hurt the trade of other countries. For actionable subsidies the complaining country has to show that the subsidy has an adverse effect on its interests. Otherwise, the subsidy is permitted. (see [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/agrm8\\_e.htm#subsidies](http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm8_e.htm#subsidies)).

is constrained to the short run, which may be reasoned by the time limitation of anti-dumping and anti-subsidy measures.

We assume that both producers can reap positive operating profit by producing to the home market, and the necessary condition for this constrains marginal costs for each of the two producers to be below 1. Operating profits  $\pi$ ,  $\pi^*$ , respectively, in the home market are defined by

$$\pi = (p - c)q; \quad \pi^* = (p^* - c^*)q^*.$$

The Nash equilibrium for the Bertrand duopoly in the *home* market is shown in *Table 3*.<sup>12</sup>

*Table 3. Equilibrium values for Bertrand competition in the home market*

|  |      |
|--|------|
| $q = \frac{(1-\lambda)(2+\lambda)-(2-\lambda^2)c+\lambda(c^*-s+t)^*}{(1-\lambda^2)(4-\lambda^2)}$          | (2a) |
| $q^* = \frac{(1-\lambda)(2+\lambda)-(2-\lambda^2)(c^*-s+t)+\lambda c}{(1-\lambda^2)(4-\lambda^2)}$         | (2b) |
| $p = \frac{(2+\lambda)(1-\lambda)+2c+\lambda(c^*-s+t)}{(4-\lambda^2)}$                                     | (3a) |
| $p^* = \frac{(2+\lambda)(1-\lambda)+2(c^*-s+t)+\lambda c}{(4-\lambda^2)}$                                  | (3b) |
| $\pi = \frac{[(2+\lambda)(1-\lambda)-(2-\lambda^2)c+\lambda(c^*-s+t)]^2}{(4-\lambda^2)^2(1-\lambda^2)}$    | (4a) |
| $\pi^* = \frac{[(2+\lambda)(1-\lambda)-(2-\lambda^2)(c^*-s+t)+\lambda c]^2}{(4-\lambda^2)^2(1-\lambda^2)}$ | (4b) |

The main focus in the analysis is the market conditions in the home country, but to establish an analysis of dumping, we need additional assumptions which allow a comparison of the price in the foreign market and the export market being charged by the foreign producer. There is a wide range of possibilities for specifying price formation in the foreign market. Belderbos et al. (2004) just assume that dumping exists, and their analysis centers on the injury margin. We assume that the foreign producer has more market power at home than in his export market, and to specify this in the simplest way we assume monopoly at home. The demand function in the foreign market is assumed to be identical to the demand function in the home market, i.e.  $p_f^* = 1 - q_f^*$ , where  $p_f^*$  and  $q_f^*$  are price and quantity, respectively, in the foreign market. The absence of competition in the foreign market may be due to government regulation or as assumed in Belderbos et al. (2004), the foreign producer's control of the net of retail sale.<sup>13</sup> As an export subsidy does not influence market equilibrium in the foreign producers' domestic market, equilibrium in the foreign market is given by:

$$q_f^* = \frac{1-c^*-d}{2} \tag{5a}$$

<sup>12</sup> Similar results for the Cournot case are shown in *Table A1* in Appendix A.

<sup>13</sup> We assume that entry barriers are the only reason for the absence of exports from the home to the foreign country. In a recent paper Collie and Le (2010) demonstrate that anti-dumping regulation in some cases can be strategically exploited by the producer in the home country not to export to the foreign market.

$$p_f^* = \frac{1+c^*-d}{2} \quad (5b)$$

#### 4. Dumping, subsidies and injury: Evaluation of the EU practice

This section applies the model developed above to the EU practice on simultaneous anti-dumping and anti-subsidy policy. Especially, the model will be used to highlight the different EU practice for export subsidies and domestic production subsidies.

The benchmark is the situation, where no subsidies and no duties are applied. To simplify, we define the EU injury margin,  $IM$ , as ‘price undercutting’ by the foreign producer in the home market (i.e. EU), calculated from (3a) and (3b) as<sup>14</sup>:

$$IM = p - p^* \quad (6)$$

To open up for price differences and injury, also in a situation without subsidies, we now assume production cost heterogeneity, i.e. the dumping producer has a production costs advantage ( $c > c^*$ ).

Similarly, the dumping margin,  $DM$ , is defined as the difference in the foreign producer’s home market price (5b) and his export price at the factory gate (3b)<sup>15</sup>:

$$DM = p_f^* - p^* \quad (7)$$

Assume now the foreign producer receives a subsidy from his government, making him more competitive. The injury margin of the EU producer increases as:

$$\frac{\partial IM^x}{\partial s} = \frac{\partial IM^d}{\partial s} = \left( \frac{\partial p}{\partial s} - \frac{\partial p^*}{\partial s} \right) = \frac{1}{(2+\lambda)}; \quad s = x, d \quad (8)$$

In the analyzed cases, where we only deal with export and domestic production subsidies granted to the producer as a specific amount per unit of output, the effect of the subsidy on the injury margin only depends on the amount of subsidy, irrespective of the type of subsidy<sup>16</sup>. The pass-through of the subsidy is in the interval  $\frac{1}{3}$  to  $\frac{1}{2}$ , as  $0 \leq \lambda \leq 1$ .

##### 4.1. Why different treatment of export subsidies and domestic production subsidies?

The dumping margin is also affected by the subsidy, but the pass-through depends crucially on the type of subsidy. For the case of an export subsidy we have:

<sup>14</sup> See also Hansen and Nielsen (2009).

<sup>15</sup> As we do not pay attention to transport costs, the exporter’s price at the firm gate equals the price charged in the destination country of the exporter.

<sup>16</sup> In general, the effects of the subsidy on the injury margin depends on the type of subsidy, e.g. for subsidies, which lowers the firm’s fixed costs, the price effects and hence, the effect on the injury margin, is nil, at least in the short run.

$$\frac{\partial DM^x}{\partial x} = \left( \frac{\partial p_f^*}{\partial x} - \frac{\partial p^*}{\partial x} \right) = \frac{2}{(4-\lambda^2)} \quad (9)$$

which increases from  $\frac{1}{2}$  to  $\frac{2}{3}$  for  $\lambda$  increasing from 0 to 1.

In the case of a domestic production subsidy, the pass-through on the dumping margin is less than for the export subsidy. This is related to the fact that the domestic production subsidy puts a downward pressure on both the foreign producers home and export price: We have

$$\frac{\partial DM^d}{\partial d} = \left( \frac{\partial p_f^*}{\partial d} - \frac{\partial p^*}{\partial d} \right) = \frac{\lambda^2}{2(4-\lambda^2)} \quad (10)$$

which increases from 0 to  $\frac{1}{6}$  for increasing  $\lambda$  from 0 to 1.

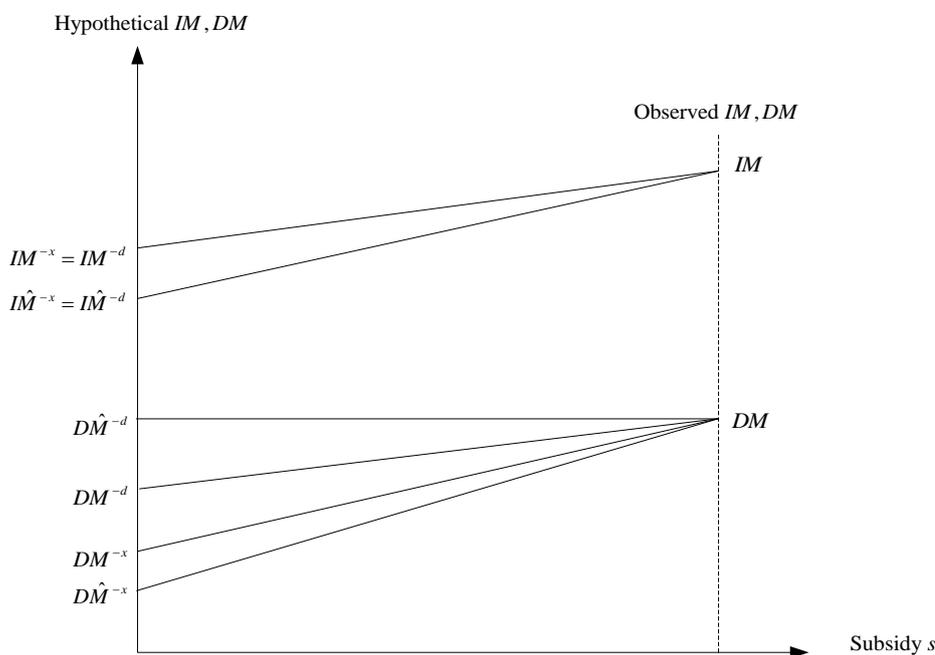
Basically, imposition of duties in case of subsidies and dumping reflects the EU policy makers' perception of fairness, and the aim is to reduce injury. But, in case of simultaneous imposition of duties, the levels of the duties are constrained by the principle that no product shall be subject to two duties dealing with one and the same situation.

A countervailing duty equal to the subsidy re-establishes the prices and the injury margin before the imposition of the subsidy, and for that reason the policy maker may find a countervailing duty of that size for a reasonable response to the improper behavior of providing the foreign producer a subsidy. The policy maker may additionally want to impose an anti-dumping duty for responding to the unfairness of that part of the dumping behavior, which is not associated with the subsidy. The idea is therefore to target the hypothetical dumping margin, which would exist if the subsidy has not been provided.

The logic of the EU procedure follows from a highly simplified perception of the effects of subsidies on prices, where unit costs translate to prices one to one. Under certain circumstances, this may be the case in markets with perfect competition, but definitely not in oligopoly markets, where dumping behavior has relevance. Given this perception of a pass-through of one of costs on prices, calculation of the hypothetical injury and dumping margins follow straightforwardly. Without the export subsidy the injury margin as well as the dumping margin would have been lower than the observed margins exactly by the size of the subsidy. Moreover, in the absence of a domestic subsidy, the injury margin would likewise have been lower by the size of the subsidy, but the dumping margin would have been unchanged as the subsidy in this case lowers the price equally in both the producer's home and export markets. These results are in contrast to the predictions from the duopoly model above, where the pass-through of the subsidy on the injury margin and the dumping margin for both types of subsidies is less than one as follows from (8), (9), and (10). The absence of a more nuanced approach to price formation in the specific cases in the EU investigations may therefore result in arbitrary decisions in relation to the objective of targeting the punishment at each of the two misbehaviors.

Figure 2 summarizes the results and illustrates actual and hypothetical injury and dumping margins without and with a given size of an export and domestic subsidy, respectively. The observed injury and dumping margins are indicated on the vertical line to the right by  $IM$  and  $DM$ . On the vertical line to the left we illustrate the hypothetical injury and dumping margins generated from the crude price approach in the EU procedure and the duopoly model, respectively.  $IM^{-x} = IM^{-d}$  illustrate the hypothetical EU injury margins, and  $DM^{-x}$  and  $DM^{-d}$  are the hypothetical dumping margins from the duopoly model in case of absence of the export subsidy (-x) or absence of the domestic subsidy (-d). The EU procedures for establishing hypothetical dumping and injury margins are indicated by  $\widehat{DM}^{-d}$ ,  $\widehat{DM}^{-x}$  and  $\widehat{IM}^{-d}$ ,  $\widehat{IM}^{-x}$  respectively.

Figure 2. Dual anti-dumping and anti-subsidy remedies in case of subsidies



In the illustrated case the injury margin exceeds the dumping margin and the case thus corresponds to Figure 1 case 2 or 5. In accordance to ‘the lesser duty rule’, the dumping margin therefore constrains the level of the anti-dumping duty. The countervailing duty should be equal to the size of the subsidy as this exactly redresses the injury margin to the prior situation for both types of subsidies. The anti-dumping duty should reflect the hypothetical dumping margin and here we have:

$$DM^{-x} > \widehat{DM}^{-x} \text{ and } DM^{-d} < \widehat{DM}^{-d}$$

The economic theory represented by the model in Section 3 only provides partial support of the EU practice of the different treatment of export subsidies and domestic production subsidies in the simultaneous anti-subsidy and anti-dumping investigations. Prices are endogenously determined in the model and formally a subsidy is a shock which translates to prices. The dumping margin

decreases (increases), when an export subsidy is removed (provided). But this is also the case when a domestic subsidy is removed if - as assumed in the model - the foreign producer has more market power at home than abroad. The pass-through of the subsidy to the dumping margin is less than one for both types of subsidies, but the dumping margin is most affected in the case of an export subsidy compared with a domestic production subsidy of the same size.

According to the EU-practice for export subsidies, the anti-dumping duty is found by deducting the countervailing duty from the measured dumping margin after the subsidy has been provided. Following this procedure, the anti-dumping duty will be 'too small', if the target is the hypothetical dumping margin, because the subsidy translates to the dumping margin by a factor less than one. On the other hand the anti-dumping duty is 'too large' in case of a domestic subsidy, where the measured dumping margin is imposed as an anti-dumping duty. In this case the decrease (increase) of the dumping margin due to the removal of the subsidy is neglected. The analysis thus confirms the assertion in Section 2 that the EU practice seems to be a more harsh treatment of domestic subsidies compared to export subsidies, seemingly in conflict with the GATT views.

The size of the 'error' for both cases of subsidies depends on how 'like' the two products are measured by the parameter  $\lambda$ . The dumping margin varies positively with  $\lambda$  for both subsidies. This means that the underestimation of the anti-dumping duty in case of export subsidies will be less for large values of  $\lambda$ , as the subsidy margin is closer to the increase in the dumping margin. In contrast, the overestimation of the anti-dumping duty in case of domestic subsidies will be larger for large values of  $\lambda$ , where the subsidy margin has a bigger impact on the dumping margin.

#### *4.2 Why initiate both a subsidy and dumping investigation?*

In case of an export subsidy in the situation, where the dumping margin is less than the injury margin, the outcome of a simultaneous subsidy and dumping investigations may be a two component duty at an overall level equal to the dumping margin. It may surprise, why in such cases, it should be necessary to initiate both an investigation of the subsidy, and independent of that an investigation of the dumping behavior. For the final result, the subsidy investigation seems redundant, and as each of the two investigations is costly for all parties, it seems to be a waste of resources to duplicate the investigation activities. However, a broader analysis provides at least two explanations of this seemingly irrationality. Both explanations relate to uncertainties of the final outcome of the investigations.

First, establishing a two component duty provides a set of targeted and hence effective incentives to the government and the company in the foreign country to terminate their 'misbehavior'. The price for a withdrawal of both duties is a suspension of both the subsidy and the dumping behavior. If the other road is followed, conducting only a dumping investigation, leading to a duty equal to the dumping margin, the foreign company may escape this sanction by reducing its price in its domestic market, so dumping no longer takes place. The foreign producer will in this case still benefit from the export subsidy and the loss of profit caused by giving up dumping behavior may be small,

especially if the foreign producer's home market is relatively small. The claimant firms and the EU-authority may then be forced subsequently to open an anti-subsidy investigation. There is therefore a risk that the final outcome of opening only a dumping investigation will be a delay of the process, and no savings of petitioning and investigation costs.

A second reason for starting a dual petition is also related to uncertainty about the final outcome. The petitioner may have a clear feeling of injury, but due to lack of transparency he may be in short of convincing knowledge about what has caused the injury. Only a careful investigation can clarify the causation of the injury and specifically, whether the injury is caused by dumping behavior or subsidies, and in case of subsidies, whether the subsidies are export subsidies or domestic subsidies. These facts are far beyond the knowledge the petitioner possesses, before the formal investigation of the trade authorities. A petition is therefore only founded on suspicion of misbehavior of the foreign firm, which subsequently has to be proved through a careful analysis of the performance of the market before sanction can be imposed. Until the results of such investigation appears, the claimant is uncertain about whether the petition will be successful or unsuccessful, i.e. the claimant's perception on beforehand may be expressed as a probability for a successful outcome. By starting two petitions, where different angles on the issue are investigated, the probability of full or partial success may increase. Moreover, the extra costs of making both a petition for a subsidy and a dumping case instead of a dumping case exclusively are limited. In case of dual petition economies of scope exist as the two cases deal with the same market. Two parallel investigations may therefore be preferred over one investigation, if the probability for success increases substantially and the extra costs are modest.

A simple example illustrates the argument. Let us assume that the probability of success of a dumping petition is  $\varphi_{AD}$ , while the costs of the investigation are  $C_{AD}$ . In case of a parallel subsidy and dumping petition we assume that the probability of success is  $\varphi_{AS,AD}$ , and the costs of investigation are  $C_{AS,AD}$ , where  $\varphi_{AS,AD} > \varphi_{AD}$  and  $C_{AS,AD} > C_{AD}$ . Finally, assuming that the gain in case of success is  $G$  for each of the two petitions, at least one of the two petitions will be conducted if  $\varphi_{AD} > C_D/G$  or  $\varphi_{AS,AD} > C_{AS,AD}/G$ . In such cases parallel investigations will be preferred if :  $(\varphi_{AS,AD} - \varphi_{AD}) > (C_{AS,AD} - C_{AD})/G$ .

## 5. Conclusions

The trade policy literature often questions the rationality of dumping behavior and export subsidies. It seems a paradox, why governments and companies involve themselves in such activities knowing that anti-dumping duties and countervailing duties are easy and legal neutralizing contingency measures which injured countries may impose, (see e.g. Qui, 1999; and Collie and Le, 2010). This paper addresses the additional paradox that firms may initiate two parallel investigations in case of simultaneous dumping and subsidies which lead to an outcome of two specific duties, of which one is assigned to the subsidy and the other to the dumping behavior.

To discuss this more specific paradox we establish a simple international duopoly model as a framework for an analysis of the EU practice on simultaneous anti-subsidy and anti-dumping investigations. We find that the imposition of a two-component duty may be rational in the sense that it provides an incentive for the offending country and companies to terminate their ‘unfair’ competition completely. Moreover, initiating two parallel investigations may reduce the time lag for implementation of the contingency measures when the diagnosis of the problem is uncertain beforehand.

The EU’s different treatment of export subsidies and domestic production subsidies is found to be rigid and partly flawed. The anti-dumping duty will be ‘too low’ in case of export subsidies, but ‘too high’ in case of domestic production subsidies. These biases may be avoided by allowing for a more nuanced analysis of the effect of the subsidy on the dumping margin. Key elements in such a broader analysis should - additional to type of subsidy - be the degree of ‘likeness’ of the products, the producer’s market power in the home as well as the foreign country, and the strategies of the producers in decision making on prices and output.

## Appendix A. The Cournot solution

Table A1. Equilibrium values for Cournot competition in the home market

| <i>Cournot</i>  |       |
|---|-------|
| $q = \frac{(2-\lambda)-2c+\lambda c^*}{(4-\lambda^2)}$  | (2A)  |
| $q^* = \frac{(2-\lambda)-2c^*+\lambda c}{(4-\lambda^2)}$  | (2B)  |
| $p = \frac{(2-\lambda)+(2-\lambda^2)c+\lambda c^*}{(4-\lambda^2)}$  | (3A)  |
| $p^* = \frac{(2-\lambda)+(2-\lambda^2)c^*+\lambda c}{(4-\lambda^2)}$  | (3B)  |
| $\pi = \left[ \frac{(2-\lambda)-2c+\lambda c^*}{(4-\lambda^2)} \right]^2$   | (4A)  |
| $\pi^* = \left[ \frac{(2-\lambda)-2c^*+\lambda c}{(4-\lambda^2)} \right]^2$                                       | (4B)  |
| $\frac{\partial IM^x}{\partial s} = \frac{\partial IM^d}{\partial s} = \frac{(1-\lambda)}{(2+\lambda)}; s = x, d$ | (8A)  |
| $\frac{\partial DM^x}{\partial x} = \frac{(2-\lambda^2)}{(4-\lambda^2)}$  | (9A)  |
| $\frac{\partial DM^d}{\partial d} = \frac{-\lambda^2}{(4-\lambda^2)}$   | (10A) |

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