WTO Dispute Settlement in Action: An Economic Analysis of four EU-US Mini Trade Wars

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Abstract

Since its inception in 1995, around 300 disputes have been raised under the WTO Dispute Settlement Understanding (DSU). In spite of the obvious numerical success of the DS system of the WTO, in practice several shortcomings call for institutional and/or procedural change. This analysis deals with the economic aspects of the DS system. First, it turns out that the WTO DS system seems to be "biased". The larger and richer trading nations (USA, EU) are the main users of this system, either because of the larger involvement in world trade, or because the LDCs simply lack the legal resources. Second, the calculation of the damage a country suffers from violating trade concessions is extremely problematic, to say the least. Third, the present practice of the WTO DS system shows that retaliation with tariffs is ineffective, distorts allocation and is difficult to control. This can be derived from recent theoretical explanations of the WTO system in general (trade talks) and the DS system in particular (aberrations from WTO compliance can lead to trade wars). This is also demonstrated in a CGE model analysis with the GTAP5 world model for the most popular disputes between the EU and the USA, which we call "mini trade wars": the Hormones, the Bananas, the FSC and most recent the Steel cases. The major conclusion of our economic evaluation is that the DS system of retaliation should be changed towards a transfer-like retaliation system. This may be economically wise but is legally not (yet) feasible.

Keywords: WTO Dispute Settlement, Trade Policy, CGE Model Simulations
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1. Introduction

One of the unique features of the WTO if one compares it to other international organizations, is dispute settlement (DS). Whether the WTO DS system is more successful than the former GATT is an open question. Some critics see a "bias" in the system because the developed countries (primarily the G4 countries Canada, EC, Japan and US) account for over 60% of all complaints (Horn-Mavroidis-Nordström, 1999). Others call for institutional and/or procedural changes (Bronckers, 2001). In preparation for the 5th Ministerial Conference in Cancun, Mexico in September 10-14, 2003, the WTO member states have made several proposals for such more formal legal changes. In principal, one should believe that everything related to international trade is a fundamental economic issue. But interestingly, until recently the field of dispute settlement was primarily a research area of lawyers. Economic theory has produced a few explicit contributions to explain the working of GATT/WTO (e.g. Hungerford, 1991; Rodrik, 1995; Staiger, 1995; Bagwell-Staiger, 1999; Spagnolo, 2001) and the system of dispute settlement (e.g., Maggi, 1999). But the actual working, possible failures and the economic implications of the WTO DS system have been examined by only a few economist as yet (e.g. Anderson, 2002; Breuss, 2003).

World trade consists of a web of bilateral relations in which large (powerful) and small (powerless) countries participate. From optimal-tariff theory one knows that for a large player in world trade the optimal tariff is positive, whereas it would be zero for a small country. WTO's major principles, reciprocity and nondiscrimination are simple rules that, when used together, can deliver an efficient outcome. Both rules can help to neutralize externalities resulting from terms-of-trade effects (Bagwell-Staiger, 1999, p. 237). Another strand of modern trade and tariff literature - building on the literature of endogenous tariff formation (see e.g. Mayer, 1984) - deals with the politico-economic explanation of trade wars. Grossman-Helpman (1995) build on a strategic interaction between interest groups and politicians in the domestic arena and strategic interaction between government in the international arena. Such models can be used to analyze the rise and fall of the Bananas dispute between the EC and the US (see Breuss, 2003). Many authors have shown that as a rule large countries will win trade wars (e.g. Whalley, 1985, chapter 14; McMillan, 1986; Kennan-Riezman, 1988; Breuss, 2003).

Since its inception in 1995, 299 bilateral disputes have been raised under the WTO Dispute Settlement Understanding (DSU). As complainants, 25.3% of which concern the EC, 24% the USA, and the rest is distributed to other countries, each involved not more than 9%. As respondent, 21.9% concern the EC, 19.9% the USA, and the rest concerns other countries,

each not more than 8% (Horn-Mavroidis-Nordström, 1999). Presently there are 27 active WTO disputes involving the EC, in 15 of these cases the EC is the complaining party while in the remaining 12 cases the EC is on the defending side (see European Commission, 2003). Those 27 cases relate to the EC's relations with 8 of its trading partners (Argentina, Australia, Brazil, India, Korea, Peru, Thailand and the US). Dispute Settlement activities against the US continue to represent the vast majority of EC's dispute settlement cases. The EC has presently 13 active WTO disputes underway with the United States. In 11 of these cases it is the Community which is the complaining party, being the defendant only in 2 cases (Hormones and EC Steel Safeguards; see Tables A.1 to A.3 in the Annex).

In the following analysis we concentrate on the four most prominent disputes between the EU and the US. The cases are: Hormones, Bananas, FSC and Steel. Out of the large number of DS cases, in only three occasions the WTO-DS authorities (Arbitrators) allowed the complainant party to introduce retaliatory measures against another WTO member. The three cases are the Hormones case, the Bananas case (now settled) and the FSC case (countervailing measures not yet implemented). In the Steel case, on July, 11, 2003 the WTO Panel against the US steel safeguards concluded that the safeguard measures imposed by the United States on the imports of certain steel products are inconsistent with the WTO Safeguards Agreement and GATT 1994. The case was brought to the WTO by the EC, Japan, Korea, China, Switzerland, Norway, New Zealand and Brazil. A fifth trade dispute may arise on genetically-modified material (GMO). In May 2003, the United States, Argentina and Canada filed a WTO case against the EC over its illegal five-year moratorium on approving agricultural biotech products. The US as the world leading supplier of biotech crops have a strong interest in the settlement of this case. Some movement in standstill in the GMO issue might bring about the adoption of two European Commission proposals by the European Parliament on July 2, 2003 concerning the genetically modified food and feed and the traceability and labelling of GMOs. By the formal adoption of these proposals by the Council of Ministers on July 22, 2003 the European legislative framwork for GMOs is in place. This is a clear EU system to trace and label GMOs and to regulate the placing on the market and labelling of food and feed products derived from GMOs. It will be interesting to hear the WTO decision on this trade dispute.

First, by analyzing each of the four EU-US trade disputes the WTO Dispute Settlement system is critically evaluated. Each dispute has its unique legal and economic history. Second, for the first time we try to quantify the welfare and trade implications of these trade conflicts

which - in line and in contrast with former studies on hypotethical large trade wars - we call "mini" trade wars. The analysis is done by simulations with the GTAP5 world CGE model which is designed for our purpose to a 12 regions, 7 sectors and 5 factors of productions model (see Table A.4 in the Annex).

2. The Hormones Case

2.1 A Brief Historical Background

In 1996, the USA and Canada held formal consultations in the framework of the WTO dispute settlement mechanism[1] with the EU regarding its legislation covering the ban on hormones (17 beta-oestradiol, progesterone, testosterone, zeranol, trenbolone and melengestrol acetate) for growth promoting purposes in livestock. Following requests from the two countries, in April 25, 1996, WTO panels were set up (WT/DS26: US complainant, third parties: New Zealand, Canada, Australia) to assess the conformity of the EC measures with its WTO obligations (relevant WTO Provisions: GATT (III or XI), SPS (2, 3, 5), TBT (2), Agriculture (4)). The EC measures (prohibiting the importation of meat and meat products that have been treated with growth hormones) were found not in conformity with a number of WTO rules. The EU objected to the conclusions of the panels in September 1997, which were consequently submitted for review to the Appellate Body (AB). On February 13, 1998 the report of the AB found that the EC had provided "general studies which do indeed show the existence of a general risk of cancer; but they do not focus on and do not address the particular kind of risk at stake here ...those general studies are in other words relevant but do not appear to be sufficiently specific to the case at hand". Due to the lack of specific scientific verification for the EC measures, the AB recommended that the EC bring its measures into conformity with its obligations under the SPS Agreement. The Arbitrator granted the Community a "reasonable period" of 15 months (until May 13, 1999) to collect further significant scientific studies in this case. The 17 studies the EC supplied, however, were not significant enough to proof the risk of cancer. On May 13, 1999 the EC decided to ban all imports of US beef and beef products – including those that have not been treated with hormones – as of June 15, 1999.

Therefore, the USA, on May 17, 1999, had requested the Dispute Settlement Body (DSB) of the WTO to authorize the suspension of the application to the EC and its Member States to

[1] The legal basis for WTO Dispute Settlement is the "Understanding on rules and procedures governing the settlement of disputes", Annex 2 of the WTO Agreement, signed at the Marrakesh ministerial meeting in April 1994.

tariff concessions. A similar request was made by Canada on May 20, 1999. On July 12, 1999, the WTO Arbitrator determined the level of nullification or impairment suffered by the USA and Canada (WTO, 1999c).

2.2 How to Calculate the Level of Damage?

On May 17, 1999, the USA had requested the Dispute Settlement Body (DSB) of the WTO to authorize the suspension of the application to the EC and its Member States to tariff concessions covering trade in an amount of US$ 202 million per year. The EC, however, calculated only a loss of US exports to the EC by US$ 53 million. A similar request was made by Canada on May 20, 1999 for an amount of CDN$ 75 million per year. The EC objected to the level of suspension proposed by the US and Canada. As the large differences between the calculated (estimated) levels of suspension proposed by the US government (US$ 202 million per year) and the EC (only US$ 53 million per year) demonstrate, it is not easy to calculate the damage a country suffers from trade-restricting measures. In the report on the Hormone case EC versus USA (WTO, 1999b, at para 36 ff.; similarly in the Canada decision, WTO, 1999c), the Arbitrators set out guidelines for the calculation of nullification and impairment. They find the proposed figures by the USA are to high, they should only be "equivalent" to the level of nullification and impairment (Art. 22.4 DSU) caused by the hormone ban of the EC. The problem is to determine an anti-monde scenario which would tell what would annual US exports of hormone-treated beef and beef products to the EC be if the EC had withdrawn the ban on May 13, 1999.

The task of estimating the level of damage for the US exporters, involves an estimation procedure in several steps (WTO, 1999b, at para 43): (1) For each product category, the Arbitrators estimate the total value of US beef or beef products – hormone treated or not – that would enter the EC annually if the ban would have been withdrawn on May 13, 1999 ("*hypothetical exports*"). (2) To estimate the nullification and impairment caused by the hormone ban, the Arbitrators deduct from that total value the current value of US exports of HQB (US high quality beef) and EBO (US edible beef offal), i.e., those that have not been treated with hormones ("*current exports*"). The arbitrators assume that these "current exports" are representative of the exports that will occur in the future with the ban in place. (3) The end result provides the estimated value of hormone treated HQB and EBO exports that would enter the EC but for the ban's continuing existence beyond May 13, 1999. The calculations are base on exports at the f.o.b. stage (excluding insurance and freight) and also on f.o.b. prices.

These estimations more or less include only unknown variables. Not only the level of "current exports" could be agreed upon between USA and EC, but also the "hypothetical exports" cannot be calculated with certainty. In order to calculate the damage for HQB, additionally further assumptions have to be made concerning the volume of the tariff quota (the EC market for HQB exports from the USA and Canada – with or without the ban – is limited by a tariff quota of 11,500 tons at an in-quota tariff rate (TQR) of 20% ad valorem. Then the US share was estimated at 92% (the rest goes to Canada). A further unknown variable is the expected price (this was taken from US suggestions of US$ 5,342 per ton, although the Arbitrators admit that this price is higher than current unit values of US beef entering the EC!). With these three parameters at hand one can calculate the "hypothetical exports", given that the TRQ is exhausted (TRQ fill is one). By reducing the current US exports by 25% the value of the "current exports" is estimated. The subtraction of the "current exports" from the "hypothetical exports" gives the damage for HQB as US$ 32.7 million. A similar exercise (with even more arbitrary adjustments) is made to estimate the damage for EBO (worth US$ 84.1 million). Together, this gives the total level of nullification and impairment for the USA of US$ 116.8 million per year (see table 1). Only slight changes in the assumed parameters (US share, price, reduction factor etc.) would change the results ad libitum!

Table 1: Calculation of the level of nullification and impairment in the USA-EC Hormone Case

High quality beef (HQB)							
[(11,500	* 1)	* 0.92	* 5,342]	- (31,804,779	*0.75)		= US$ 32,664,776
TRQ	TRQ fill	US share	price/t (f.o.b.)	current exports (f.o.b.)	25% reduction for "test & hold"		Total
Edible beef offal (EBO)							
[(65,568	*	0.816	* 1,689)	- (2,460,759	* 0.75)]	*0.95	= US$ 84,095,731
av. 86-88 exports 18.4% adjustment for decline in consumption but for the ban			price/t (f.o.b.)	current exports (f.o.b.)	25% reduction for "test & hold"	5% red. for pet food usage	Total
Total: HQB + EBO							= US$ 116,760,507

Source: WTO (1999b), Annex I.

On July 12, 1999, the WTO Arbitrators determined the level of nullification or impairment suffered by the United States in the matter European Communities – Measures Concerning

Meat and Meat Products (Hormones) at US$ 116.8 million per year (WTO, 1999b) and CND$ 11.3 million per year (WTO, 1999c), respectively. Furthermore, the suspension by the USA of the application to the EU and its member States of tariff concessions and related obligations under GATT 1994 covering trade in a maximum amount of US$ 116.8 million per year would be consistent with Article 22.4 of the DSU (WTO, 1999b, at para 83 and 84). The retaliatory tariff measures by the USA are set in this case in the same sector as the noncompliance has taken place, namely in the agricultural sector and concern a variety of EC agricultural products[2]. The EC feared that the USA would resort to a "carousel" type of suspension where the concessions and other obligations subject to suspension would change every now and then, in particular in terms of product coverage. The arbitrators in its report (WTO, 1999b, at para 22), however, assumed that the USA will not implement the suspension of concessions in a "carousel" manner!

Since July 1999, the USA have taken countervailing measures worth US$ 467.2 million (US$ 116.8 million over four years). This amounts to 0.05% of the total EU exports to the USA each year, or 0.11% of agricultural EU exports to the USA each year. As the Hormones case is not yet resolved, the sanctions taken by the US are still in place.

2.3 Economic Impact of the Hormones EU-US "Mini" Trade War

The welfare and trade implications of this "mini" trade war between the EU and the USA are analyzed with the help of model simulations with the GTAP5 CGE world model with 12 regions, 7 sectors and 5 factors of production (see Table A.4 in the Annex). However, there are a lot of economic problems and peculiarities surrounding the implementation of the retaliatory measures of the decisions by the WTO Arbitrators into a general equilibrium model:

- *Amount of suspension:* In the hormones case, what does it mean when the "Arbitrators decide that the suspension by the United States of the application to the European Communities and its member States of tariff concessions and related obligations under GATT 1994 covering trade in a maximum amount of US$ 116.8 million per year would be consistent with Article 22.4 of the DSU" (WTO/DS26/ARB, p. 17)? Does this means that the US can reduced their imports in the sector "Meat" from the EU by US$ 116.8 million per year or does this means that the US may increase their import tariffs on meat from the EU until the revenues reach US$ 116.8 million each year? Because of this

[2] The list of agricultural products for suspension of concessions proposed by the USA, can be found in Annex II of WTO (1999b).

ambiguity we simulate two alternative scenarios of retaliations (one targeting the imports and one targeting the tariff revenues).

- *Trade loss equivalent and economic welfare:* The other problem is that the damage is calculated by the WTO Arbitrators as a nominal damage and the retaliatory measures are defined as a simple static value of imports. Such a procedure, however, completely neglects the reactions of importers on increased tariffs! As Anderson (2002) demonstrates (see also Figure 1 in the Annex), the trade loss equivalent never translates into equivalent damage to economic welfare, except by coincidence. In general, both the complainant and the respondent will suffer a welfare loss by retaliation. Therefore, when a complainant (in the hormones case the US) implements retaliatory measures by imposing (prohibitive) measures by raising the import tariffs by 100% on an arbitrary list of products, this not only hurts the respondent (in this case the EU) by reducing its export chances, it also hurts the complainant (its consumers) and therefore one often speaks in this context of a situation of "shooting oneself in the foot" (see e.g. Mavroides, 2001, p. 46 for such a phrase).

Three scenarios:

The dimension of the trade disputes are calibrated in the GTAP5 model according to the amounts of damage calculated by the WTO arbitrators in each of the four trade disputes.

(I) In the *first scenario*, the EU imposes a trade regime (in the Hormones case the ban on US exports of beef to the EC market as of May 13, 1999) which does not comply with WTO rules (violates several agreements). The trade restriction (increase of import tariffs) in the GTAP5 model is so calibrated (by increasing import tariffs) that the meat imports of the EU from the USA are reduced by US$ 116.8 million. This is equal to the estimated level of nullification and impairment by the WTO DS decision.

(II) In the *second scenario*, the USA retaliates against the EU according to the decision of the WTO arbitrators. However, due to the ambiguity of their decision two sub-scenarios are calculated:

(IIa) In this scenario the USA reduces its imports from the EU by US$ 116.8 million distributed on several sectors according to the retaliation list of products (see Annex II in WTO, 1999b). We implemented these retaliations in the sectors "meat", "food", "other primary products" and "manufacturing".

(IIb) In this scenario the USA reduces imports from the EU in order to collect import tariff revenues amounting to US$ 116.8 million. The implementation is done in the same sectors of the model as in scenario (IIa).

(III) In the *third scenario* we simulate the economic impact of the combined implementation of measures and counter-measures of the scenarios (I) and (IIb) which is what we call the "mini" trade war.

Table 2: "Mini" Trade War EU versus USA: Hormones Case

Scenarios	**Welfare Total*)** (as % of GDP)		**Welfare Allocation** (as % of GDP		**Terms of Trade** (%-change)	
	EU	**USA**	**EU**	**USA**	**EU**	**USA**
(I)	-0.000539	-0.000264	-0.000750	-0.000001	0.000676	-0.002122
(IIa)	-0.000334	0.000129	0.000003	-0.000028	-0.001097	0.001288
(IIb)	-0.001389	0.000443	-0.000129	-0.000123	-0.004100	0.004667
(III)	-0.001929	0.000179	-0.000879	-0.000124	-0.003424	0.002545
	Exports with Partner (%-change)		**GDP, nominal** (%-change)		**GDP, real** (%-change)	
(I)	-0.008001	-0.028448	0.001249	-0.001964	-0.000750	-0.000001
(IIa)	-0.061330	-0.012093	-0.002345	0.001747	0.000003	-0.000028
(IIb)	-0.239540	-0.045044	-0.008696	0.006235	-0.000129	-0.000123
(III)	-0.247541	-0.073499	-0.007447	0.004272	-0.000879	-0.000124

*) Total welfare = allocation plus terms of trade plus other effects.
(I) = EU bans MEAT imports from the USA amounting to US$ 116.8 million.
(IIa) = USA reduces imports from EU by US$ 116.8 million according to retaliation list of products.
(IIb) = USA reduces imports from EU in order to collect import tariff revenues by US$ 116.8 million according to retaliation list of products.
(III) = EU versus USA trade war: Scenarios (I) + (IIb) combined.
Source: Own simulations with the GTAP5 world CGE model.

Simulation results:

The simulation results of the GTAP5 model are presented in Table 2 and can be summarized as follows:

(a) All the effects are small due to the low amount of impairment involved relative to total trade between both partners. The trade restrictions amounting US$ 116.8 million per year add up only to 0.05% of the total EU exports to the USA each year or 0.11% of agricultural EU exports to the USA.

(a) Nevertheless, the ban on hormone treated US beef seems to have the effect of "shooting the EU themselves in the foot", as this scenario (I) leads to slight welfare losses (measured by the total welfare measure of GTAP5, covering allocation and terms of trade effects), whereas the US loses only slightly. Obviously, the EU population weighs health higher than simply more consumption of beef (which is implied in the traditional welfare measure). Therefore, a simple welfare measure may be misleading. However, the EU can

improve their terms of trade, whereas the US loses here. Trade between both partners slightly decreases.

(b) The retaliation by the USA (scenario IIa and IIb) leads to welfare losses for the EU, whereas for the USA only negative allocative effects occur. Their terms of trade improve. Again, one could say that the tariff-imposer USA is "shooting in its foot"! Bilateral trade volume declines. Real GDP decreases, nominal GDP increases slightly in the US due to additional tariff revenues, more so in scenario (IIb) than in (IIa).

(c) The "mini" trade war between the USA and the EU is given when both scenarios (I) and (IIb) are simulated together -which in reality takes place in this trade dispute. This leads to a slight welfare loss in the EU and a slight gain in the USA (due to terms of trade improvements[3]). Trade between each other declines, so does real GDP, stronger in the EU than in the US. In this case US exports to the EU already decline by 0.2%. Overall, the EU is the loser of this "mini" trade war.

Since the Hormones case is not yet resolved, the sanctions amounting to US$ 116.8 million per year are still maintained by the US government. So the estimated welfare and trade effects calculated on the basis of an annual measure must be quadrupled already.

Although in Table 2 we presented only the economic impact of this "mini" trade war for the two parties involved (EU and USA), the retaliation measures taken by the complainant US against the respondent EU affect, however, also third countries via trade diversion. This "externalities" of WTO-allowed retaliation was not considered by the designers of the WTO dispute settlement system. In scenario (III) the third country effects are the following: Measured by total welfare only Korea would suffer a slight welfare loss, whereas in the other nine regions (inclusive ROW) there would be a slight welfare gain.

[3] The fact that the USA and the EU are more or less equally large world trade players (with a market share of around 20% each) lead to the theoretical effects, derived from the theory of optimal tariffs (see Johnson, 1958), that they can influence the terms of trade. Improvements occur if one of these two regions either makes a protectionist first mover step (increases tariffs) or in case of a mutual retaliatory game the terms of trade improvements depend on the asymmetry of measures taken (see Breuss, 2003 for an extensive discussion of the implications of trade wars).

3. The Bananas Case

3.1 The Genesis and the End of the Banana Dispute

In 1993 the EU accepted a regime for the importation, sale and distribution of bananas (Common Market Organization for bananas), established by Council Reg. No. 404/93 on the common organization of the market in bananas and subsequent EC legislation, regulations and administrative measures, including those reflecting the provisions of the Framework Agreement on Bananas (the "BFA"), which implement, supplement and amend that regime. The idea behind this import regime with a complicated tariff-quota system was first, to have a common trade regime for EC's Single Market and second, to prefer ACP countries (including former EC member states colonies) at the expense of traditional bananas supplier from Latin America and the USA[4].

Ecuador, Guatemala, Honduras, Mexico and the USA filed a complaint against this import regime for bananas (with the third parties Saint Lucia, Dominican Republic, Nicaragua and Jamaica) at the WTO by starting formal consultations with the EC in February 1996. Following request by the complainants, in April, 1996 WTO panels were set up (WT/DS27). This import regime was found to be illegal by the WTO in 1997. DSB recommendations were implemented in a revised scheme by the EC on January, 1999 (by EC Reg. 1637/98 and 2362/98). Complainants contended that the new EC regime continued to violate WTO obligations. The main criticisms were the setting aside of a quantity reserved solely for ACP imports (fails to conform to the "non-discrimination requirements" of Article XIII of GATT 1994), and the allocation of licenses on a "historical" basis (i.e., reflecting past sales; which violates Articles II and XVII of GATS). According to WTO, this did not eliminate the "drag-on" discrimination vis-à-vis third-country operators. In the Bananas case several WTO provisions are relevant or agreements are violated, respectively: GATT (I, II, III, X, XI, XIII), Licensing (1, 3), Agriculture, TRIMS(2) and GATS (II, XVI, XVII).

The USA requested suspension of concessions of a considerable amount which - after the EC requested arbitration - was arbitrated by the WTO on April 19, 1999. The DSB of the WTO authorized the USA to suspend concession made in the Uruguay Round. In addition to the USA sanctions against the WTO-illegal EC import regime for bananas, the Arbitrators (WTO, 2000) decided in favor of Ecuador and authorized this country to retaliate against the EU. Ecuador was allowed to suspend concessions under the TRIPS agreement.

[4] For a comprehensive documentation and analysis of the Banana Dispute, see Breuss, Griller, and Vranes (2003).

Only after nearly a decade, the Banana dispute had been resolved. In the long-standing Bananas case, the second phase of the Understanding concluded with the US and Ecuador has been implemented as foreseen on January 1, 2002, with the entry into force of Council Regulation (EC) No 2587/2001. That meant that the EU adjusted its Common Organization of the Market in Bananas, coming into force as of January 1, 2002. As a consequence of the earlier agreement with the USA and Ecuador, the US government lifted its sanctions as of July 1, 2001 already. In accordance with Article 16(1) of Regulation No (EC) 404/93 (as amended by Regulation No (EC) 216/2001)), the European Communities (EC) hence will introduce a Tariff Only regime for imports of bananas no later than 1 January 2006 (see the notification of the mutually agreed solution; WTO (2001a)).

3.2 A Scandal in Calculating the Level of Damage?

The estimation of an "equivalent" level of nullification or impairment suffered by EC's import regime for bananas is even more complicated (and hence, more problematic) than in the Hormones case. On the one hand, more agreements are relevant in this case (GATT, GATS, TRIPS, etc.), on the other the calculation of the "hypothetical" exports are more difficult because the EU changed its regime continuously and at the time of determination the damage, nobody knew the new EU regime as a counterfactual base for calculations.

To tackle this problem, the Arbitrators in the decision for the United States (WTO, 1999a at para 6.3 to 6.27) set out general and special considerations concerning the calculation of compensation:

(1) Retaliation duration: Compensation and the suspension of concession are only *temporary measures* (Art. 22.1 DSU). According to the USA and agreed upon by WTO, countermeasures should only *induce compliance*.

(2) Direct or *"indirect" benefits*: Besides the estimation of the direct damage (which is complicated enough), the USA argued that they suffered also an "indirect" damage. US exports to Latin America (e.g., fertilizers) used in the production of bananas that would be exported to the EU under a WTO-consistent regime should be counted in setting the level of suspension (Article XXIII:1 of GATT 1994; GATS does not contain analogous provisions)[5].

(3) The damage of *services*: The EU argued that the revision of the UN Central Product Classification (CPC) system affects the interpretation of the scope of its market access on

"wholesale trade services". WTO concludes that for the calculation of nullification or impairment by reference to losses of actual or potential service supply, it does not matter whether the lost services relate to trade in bananas from the USA, or from third countries, to the EU, or to bananas wholesaled within the EU, provided that the services suppliers harmed are commercial present in the EU and US-owned or US-controlled.

(4) *Company-specific effects vs. overall country effects*: Originally, the USA requested only compensation for the losses incurred by one company. The WTO, however, sees it necessary to calculate the aggregate net effects on all US suppliers of wholesale services to bananas wholesaled in the EU.

On January 14, 1999, the United States requested the DSB to authorize suspension of tariff concessions covering trade in an amount of US$ 520.0 million per year (see WTO, 1999a, at para 1.1). The EU objected to the level of suspension on the ground that is was not equivalent to the level of nullification or impairment of benefits suffered by the USA. More so, the EU contends that with respect to trade in goods the nullification or impairment suffered by the USA can only be negligible or nil since there is no actual trade and little prospect for potential trade in bananas between the USA and the EU (WTO, 1999a, at para 6.8).

In contrast to the Hormone case, the calculation of the levels of suspension of concessions are much less (or not at all) transparent (see WTO, 1999a, at para 7.1 to 7.8). The principle of estimating the level of damage is, however, the same. The value of relevant EC imports from the USA under the present banana import regime (the "actual situation") is compared with their value under a WTO-consistent regime (a "counterfactual" situation). The USA proposed very high counterfactual figures assuming a regime change in favor of them. In response, the EU argued (correctly) that there could be many possible WTO-consistent counterfactuals with rather different outcomes as to the potential damage for the USA. Two examples were a tariff-only regime (which will be implemented only in 2006!) and the current tariff quota regime with a first-come, first-served licensing system.

The WTO requested the USA to provide calculations for four "counterfactuals" to the actual EC revised regime (in parenthesis the proposed figures provided by the US government): (1) a tariff-only regime, without tariff quotas, but including an ACP tariff preference (US$ 326.9 million); (2) a tariff-quota system with license allocations based on the first-come, first-served method (US$ 619.8 million); (3) the complete allocation of a tariff-quota system with country-specific allocations to all substantial and non-substantial ACP and non-ACP suppliers (US$ 558.6 million); (4) the base US counterfactual, which assumed a continuation of a

[5] These indirect damages were, however, not accounted for in the calculations of the level of compensation by

857,700 ton quantity for ACP imports and an expansion of the MFN tariff quota to 3.7 million tons (US$ 362.4 million).

The EU believed that none of these counterfactuals would involve higher profits for US suppliers than the current revised regime. The WTO sees the relevant effect not on US suppliers' profits but rather on the value of relevant imports from the USA. The Arbitrators could either pick out one figure between the range of possible estimated damages supplied by the USA (from US$ 326.9 million to US$ 619.8 million) or nil as asserted by the EU, or make own calculations. They did the latter by assuming as a reasonable counterfactual, a global tariff quota equal to 2.553 million tons (subject to a 75 Euro per ton tariff) and unlimited access for ACP bananas at a zero tariff. Import licenses would be allocated differently in order to remedy the GATS violations (WTO, 1999a, at para 7.7 and 7.8). Then they calculated the relevant US imports of the revised EC banana regime (the "actual" situation), compared them with the counterfactual (the "counterfactual" situation), and based on the assumption that the *aggregate volume* of EC banana imports is the same in the two scenarios. This implies that EC banana production and consumption, and the f.o.b., c.i.f., wholesale and retail prices of bananas, also is the same in the two scenarios. This in turn implies that the *aggregate value* of wholesale banana trade services after the f.o.b. point, and the aggregate value of banana import quota rents, is the same in the two scenarios. Both values are calculated from the price and quantity data made available to the WTO (which, however, are not quoted in the decision). The only difference between the scenarios is in the shares of those aggregates that are enjoyed by US and other *service* suppliers. The WTO assumes away the volume of responsiveness of producers, consumers and importers to EC domestic price differences, since there are none. Then the Arbitrators simply calculated the difference between the two scenarios in (a) the US share of wholesale trade services in bananas sold in the EU and (b) the US share of allocated banana import licenses from which quota rents accrue.

As a result, the Arbitrators determined that the level of nullification and impairment is US$ 191.4 million per year. On April 19, 1999 the DSB of the WTO authorized the USA to suspend concessions worth US$ 191.4 million per year (WTO, 1999a). The non-transparent way in which the Arbitrators dealt with this calculation exercise is near to the border of a scandal. In sharp contrast to the Hormones case (see Table 1), where each commentator can simply reproduce the different steps which lead to the final amount of the level of

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the Arbitrators of the WTO in the EU-USA Bananas case.

nullification and impairment, the Arbitrators refused to document the steps on the way to the final result.

The USA carried this trade sanctions out by setting 100% customs duties on an equivalent amount of trade for a variety of EC products. First, the USA requested authorization to suspend concessions under Art. 22.3(b) or (c). The EC claimed that this would be a cross-sectoral request and that the USA had not fulfilled the procedural requirements foreseen in Art. 22.3(d and e). The Arbitrators did not share the EC's view (see, WTO, 1999a at para 3.8 to 3.10). In order to make the decision legally easier and quicker, the Arbitrators concluded, based on Art. 22.3(a) that the Appellate Body has found that in the Bananas case nullification occurred in the "same sector(s)". That means that violations under the GATT and the GATS in the original dispute were closely related and all concerned a single import regime in respect of one product, i.e., bananas. In DSU legal terms (Art. 22.3(f(i)), US retaliations by imposing tariffs on industrial goods concern the "same sector(s)" (i.e., all goods!) as the bananas belong to! In economic terms, however, it makes a difference in which sectors a country retaliates against violations in, say the agricultural sector (bananas). Among specific sectors that suffered the most were bed linen, bath products (for example UK company "The Body Shop" and French company "Le Laboratoire du Bain"), folding cartons and boxes for luxury goods (e.g., German company "Karton Druck"), lead acid batteries (e.g., Italian company FIAM), luxury handbags and wallets (e.g., French company "Louis Vuitton" and Italian company "Gucci"), lithographs and coffee-making machines[6]. The "carousel" method, announced by the US government, whereby the products subject to sanctions would have been rotated every 6 months, however, was not applied.

In addition to the US sanctions against the WTO-illegal EC import regime for bananas, the Arbitrators (WTO, 2000) decided in favor of Ecuador and determined that the level of Ecuador's nullification and impairment is US$ 201.6 million per year. Ecuador is allowed to suspend concessions under the TRIPS agreement. Ecuador was allowed to apply sanctions in form of "cross-retaliation" according to Art. 22.3.c (suspension of concessions under another covered agreement as in the Bananas case, namely those concerning the agricultural sector)[7]. Ecuador, however, decided not to implement sanctions against the EU. A classical case of the "biased" position of small and poor countries vis-à-vis large and powerful trade regions, like the EU.

[6] For the complete list of products involved, see: http://europa.eu.int/comm/trade/miti/dispute/bana.htm

[7] For the calculation of the level of nullification and impairment, see WTO (2000) at para 166-170). For the legal discussion about the novelty of "cross-retaliation", see Bronckers (2001), pp. 59-61 and Vranes (2000; 2003b).

Since March 1999, the USA has taken countervailing measures worth US$ 478.5 million (US$ 191.4 over 2 ½ years; March 1999 to July 2001). This amounts to 0.08% of the total EU exports to the USA each year, or 0.19% of agricultural EU exports to the USA each year. With a world market share of some 23% the EU is the world's second biggest banana importer, following the USA (30%).

3.3 Economic Impact of the Bananas EU-US "Mini" Trade War

The welfare and trade implications of this "mini"-trade war between the EU and the USA are again analyzed with the help of model simulations with the GTAP5 CGE world model as in the Hormones case.

Three scenarios:

(I) In the *first scenario*, the EU has in place its import regime for bananas which is protectionist according to WTO worth US$ 191.4 million per year; in the model simulations, these measures are assumed to be taken in "bananas" sector. (The Arbitrators of the WTO, however, calculated the level of damages for US firms on the assumption that they occurred only in the wholesale trade service sector for bananas!). The restrictive EU Banana regime is implemented in the GTAP5 model by assuming that in the banana sector the EU imports from the USA are reduced by the amount of damage calculated by the WTO arbitrators (US$ 191.4 million per year). Technically this is reached by calibrating an adequate increase of EC tariffs on bananas imports from the USA.

(II) In the *second scenario*, the USA imposes trade sanctions according to the WTO DSB decisions worth the same amount. As we have the same ambiguity in the WTO arbitrators decision as to the correct meaning of the retaliatory sanctions ("In light of the foregoing considerations, the Arbitrators determine that the level of nullification or impairment suffered by the United States in the matter European *Communities –Regime for the Importation, Sale and Distribution of Bananas* is US$191.4 million per year. Accordingly, the Arbitrators decide that the suspension by the United States of the application to the European Communities and its member States of tariff concessions and related obligations under GATT 1994 covering trade in a maximum amount of US$ 191.4 million per year would be consistent with Article 22.4 of the DSU.", see WTO (1999a, p. 43) we simulate two sub-scenarios.

(IIa) In this scenario the US reduces imports from EU by US$ 116.8 million according to the retaliation list of products. As the products of retaliation concern all manufactured goods we reduce US imports from the EU in the "manufactures" sector by US$ 191.4 million.

(IIb) In this scenario the US reduces imports of manufactures from the EU in order to collect import tariff revenues amounting to US$ 191.4 million.

(III) In the *third scenario* we calculate the economic effects of the "mini" trade war in the case of the banana dispute between the EU und the USA. This scenario consists of the combined implementation of the measures of the scenarios (I) and (IIb).

Table 3: "Mini" Trade War EU versus USA: Bananas Case

Scenarios	**Welfare Total*)** (as % of GDP)		**Welfare Allocation** (as % of GDP		**Terms of Trade** (%-change)	
	EU	**USA**	**EU**	**USA**	**EU**	**USA**
(I)	0.000201	-0.000756	-0.000139	-0.000171	0.001079	-0.004780
(IIa)	-0.000671	0.000177	-0.000143	-0.000024	-0.001732	0.001558
(IIb)	-0.002685	0.000709	-0.000571	-0.000097	-0.006929	0.006233
(III)	-0.002483	-0.000048	-0.000709	-0.000268	-0.005850	0.001453
	Exports with Partner (%-change)		**GDP, nominal** (%-change)		**GDP, real** (%-change)	
(I)	-0.013515	-0.065884	0.003328	-0.004246	-0.000139	-0.000171
(IIa)	-0.105096	-0.018708	-0.003803	0.002279	-0.000143	-0.000024
(IIb)	-0.420391	-0.074826	-0.015214	0.009115	-0.000571	-0.000097
(III)	-0.433907	-0.140710	-0.011886	0.004869	-0.000709	-0.000268

*) Total welfare = allocation plus terms of trade plus other effects.
(I) = EU blocks BANANAS imports from the USA amounting to US$ 191.4 million.
(IIa) = USA reduces imports from EU by US$ 191.4 million according to retaliation list of products.
(IIb) = USA reduces imports from EU in order to collect import tariff revenues by US$ 191.4 million according to retaliation list of products.
(III) = EU versus USA trade war: Scenarios (I) + (IIb) combined.
Source: Own simulations with the GTAP5 world CGE model.

Simulation results:

The simulation results of the GTAP5 model are presented in Table 3 and can be summarized as follows:

(a) Again, due to the small dimension of the levels of trade restrictions and/or amount of impairment, the effects are small. The trade restrictions amounting US$ 191.4 million per year add up only to 0.08% of the total EU exports to the USA each year or 0.19% of agricultural EU exports to the USA.

(b) The EC import regime for bananas (scenario I) is similar to the Hormones case, as this acts as "shooting the EU themselves in the foot" insofar, as it ends in a loss in consumer welfare (misallocation) but due to terms of trade gains in a slight overall welfare improvement of the EU. Total trade between the partners is dampened. Total real GDP in both regions decline. In a partial-equilibrium analysis of EC's banana regime, Badinger-Breuss-Mahlberg (2002) come to similar conclusions concerning the EU as a whole. The

overall welfare loss over the period 1993-1998 amounted to Euro 68 million or 0.001% of GDP[8].

(c) The retaliation by the USA (scenario IIa and IIb) leads to welfare losses in the EU, but to slight gains in the USA. This is again due to terms of trade gains in the US. Bilateral exports shrink and also real GDP declines in both regions.

(d) The "mini" trade war between the USA and the EU leads to a welfare losses in both regions, but higher in the EU. The USA can improve its terms of trade. Bilateral trade was hampered quite a bit. Real GDP declines in both regions. Overall, the EU is again the loser of this "mini" trade war.

The third-country (welfare) externalities of scenario (III) are for all nine regions in the GTAP5 simulations positive. Only if looking at the allocation components of the welfare measure, Turkey suffers slightly from the "mini" bananas trade war between the EU and the USA.

The same caveats as observed in the Hormones case are applicable in the Bananas case. Besides the ex post controlling problem about the level of collecting the "right" (equal) amount of retaliatory tariff revenues which have been granted to impose by WTO, we see in this case clearly the "biased" applicability of DS measures if they come along in the form of tariffs. Large countries (the USA) are able to confront another large country or trading bloc (the EU), whereas small and/or poor (LDC) countries (in this case, Ecuador) are unable to go ahead with such sanctions. Why then did the EU give in at all? First, the next WTO negotiations (the Doha Round) are in preparation in which the EU wants to be a fair partner with special interest (e.g., in the agricultural sector). Second, obviously the EU was eager to sustain the credibility of the binding nature of the DS system. If not, other WTO members in future cases could have argued that the EU itself did not regard the DS decisions as binding. Third, the USA have promised to use its sanctions only as a temporary measure in accordance with Art. 22.1 DSU.

[8] The special topic of the Badinger-Breuss-Mahlberg (2002) study, however, is not the estimation of the welfare impact of the EC import regime for bananas for the EU as a whole, but the estimation of the welfare implications for the individual EU countries. It turns out that countries with formerly free trade regimes for bananas are welfare losers (Austria, Finland, Germany and Sweden). Also the group of tariff imposing countries (Belgium-Luxembourg, the Netherlands, Denmark and Ireland) is losers. From the countries which are supplied by ACP countries, Italy is a winner and United Kingdom is a loser. Counties with own bananas production are partly winners (France and Greece) and partly losers (Portugal and Spain).

4. The FSC Case

4.1 A Special Kind of Export Subsidization

On November 28, 1997 the EU requested for consultations on the US Internal Revenue Code (sections 921-927) and related measures establishing special tax treatment for "Foreign Sales Corporations" (FSC). The FSC scheme provides for an exemption to the general tax rules which results in substantial tax savings for US companies exporting through FSCs. The EC argued that the exemptions from the US direct (income) taxes of a portion of FSC income related to exports and of dividends distributed to US parent companies constitute *export subsidies* contrary to Article XVI GATT 1994 and Article 3.1(a) of the ASCM. The case was filed at WTO under WT/DS108 and touches provisions on Subsidies (3) and Agriculture (8, 9, 10).

The USA decided to introduce the FSC scheme in 1984 as a replacement of its old export promoting tax scheme, the so-called DISC that was condemned by a GATT panel in 1981. The EC contested the legality of the FSC scheme. After unsuccessful rounds of consultations the EC decided to request the establishment of a WTO Panel in September 1998. In the WTO Panel report (October 8, 1999), the FSC was found to constitute a prohibited *export subsidy* under the Subsidies Agreement and (in relation to agricultural products) an export subsidy in violation of the Agriculture Agreement. The US appealed to the WTO Appellate Body on November 26, 1999. The AB confirmed on February 24, 2000 all the findings of the Panel as to the WTO compatibility of the FSC. The USA was given until October 1, 2000 at the latest to implement the WTO recommendations and rulings.

As the implementation deadline was exceeded without a satisfactory change in the FSC regulations, on November 17, 2000 the EU has requested the WTO to authorize trade sanctions on the USA up to a maximum amount of US$ 4.043 billion in the FSC trade dispute. This amount is based on the value of the subsidy granted by the USA under the FSC scheme according to the figures in the fiscal year 2001 US Budget proposal. The USA continue to provide a significant illegal export subsidy to more than half of total US exports, to the direct detriment of European companies. The US sectors that benefit the most from FSC are: chemical, pharmaceutical, mechanical machinery, electrical equipment and transport equipment; these are sectors where US and EC companies fiercely compete. The EU has also submitted to the WTO an indicative list of those products that would be eligible for sanctions. The list of products avoids premature and unnecessary effects on trade flows while at the same time complying with WTO obligations. The EU argues in its "Background on latest

developments in the FSC trade dispute" of November 17, 2000[9], that the list includes chapters of the Common Customs Tariff where the EU has found that there are products that could be subjected to sanctions without negatively affecting the EU industry and consumers as the degree of dependency from the USA is low and there are alternative sources of supply available either within the EU or in third countries. If no imports stem from the USA, how would the EU then be able to collect the demanded tariff revenues amounting to around US$ 4 billion per year? The latest Panel decision of August 20, 2001 (WTO, 2001b) confirms the EU position that also the revised US FSC regulation ("FSC Repeal and Extraterritorial Income Exclusion Act of 2000"), set into force on November 15, 2000, is still not consistent with the SCM Agreement and the Agreement of Agriculture. Additionally, the legislation maintains in place the FSC regime at least until the year 2002.

4.2 The Level of Damage - Easier to Calculate?

At first sight, it seems that in contrast to the Hormones and the Bananas cases, the calculation of the damage for EC firms should be simpler, because the US budget pays for the FSC subsidies and must therefore provide respective amounts in the budget plans.

On August 30, 2002 the WTO arbitrators estimated the damage of nullification for the EU amounting to US$ 4,043 million (WTO, 2002). However, this was only a compromise:

"Having regard to the figures reached on the basis of the calculation, we note that the final amount of subsidy following the United States approach is US$ 3,739 million, whereas the final amount following the European Communities approach is US$ 5,332 million. We see merits and shortcomings in both calculations. We also recall that we are not expected to calculate an exact amount but to determine whether the amount of countermeasures proposed by the European Communities, in the amount of US$ 4,043 million, is appropriate. In these circumstances, we find that the amount of $4,043 million, which falls within the range of reasonable values calculated on the basis of the parties' respective methodologies, can be considered to be a reasonable approximation of the actual value of the subsidy for the year 2000." (WTO, 2002, p. 39-40).

There is a further problem: Although the FSC regulation is non-discriminatory - meaning that not only the exports to the EU are targeted - only the EU complained at the WTO against this export subsidization scheme. In order to evaluate the whole impact of the FSC one should also implement the costs for Non-EU countries. However, as no other third country, except the EU filed a complaint against the USA, there is no decision by the WTO as to the damage

[9] The background information on the FSC case in view of the EU can be found on:

to Non-EU countries, we restrict our calculations of the economic impact only on the EU-US trade relations.

As of May 7, 2003 the WTO authorized the EU to apply countermeasures of up to 4 billion USD against the USA (see EU homepage). The WTO Dispute Settlement Body authorized the EU to increase customs duties up to the level of 100%, for a total of US$ 4 billion of US trade. This move clears the way for the EU to impose countermeasures to be applied on a detailed list of products notified to the DSB (see WTO, 2003a). If the United States may not comply until autumn 2003, the EU will start the legislative procedure for the adoption of countermeasures by 1 January 2004. This would amount to 1.8% of the total EU exports to the USA each year, and hence, in comparison to the other mini trade wars would have a bigger impact on the bilateral trade relations.

4.3 Economic Impact of the FSC EU-US "Mini" Trade War

As the EU not yet implemented the countermeasures the calculation of the welfare and trade implications of this "mini"-trade war between the EU and the USA is hypothetical. However, it might become reality as of January 1, 2004 if the US does not comply. The FSC case is quantitatively by far the most important case for both sides. Again we analyze this case with the help of model simulations with the GTAP5 CGE world model as in the previous cases.

Three scenarios:

(I) In the *first scenario* the US subsidizes exports to the EU (but in principle to all third countries) by the estimated amount of US$ 4 billion. The implementation into the GTAP5 model is done in practically all 7 sectors so as to increase the export subsidies in order to reach an increase of US exports to the EU by US$ 4 billion.

(II) In the *second scenario* the EU retaliates with the same amount. But due to the ambiguity of the WTO decision, again we differentiate into two sub-scenarios. These scenarios are still hypothetical, as the EU not yet introduced the countervailing measures.

(IIa) In this scenario the EU reduces imports from the USA amounting to US$ 4 billion according to the list of retaliation of products. In our model simulations this means an increase of import tariffs in the sectors meat, food, steel, other primary goods, steel and manufactures.

(IIb) In this scenario the EU reduces imports from the USA in the same sectors as in scenario (IIa) in order to collect import tariff revenues equivalent to US$ 4 billion.

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http://mkaccdb.eu.int/miti/dsu

(III) In the *third scenario* we simulate the - now not so small - "mini" trade war between the EU and the US in the FSC case. For this purpose we implement the scenarios (I) and (IIb) simultaneously into the model.

As mentioned above, in reality the FSC regulation of the US not only stimulates exports to the EU but also to other third countries. As those, however, did not apply for sanctions at the WTO, we can only measure the possible economic impact for the EU-US relations.

Table 4: "Mini" Trade War EU versus USA: FSC Case

Scenarios	**Welfare Total*)** (as % of GDP)		**Welfare Allocation** (as % of GDP		**Terms of Trade** (%-change)	
	EU	**USA**	**EU**	**USA**	**EU**	**USA**
(I)	0.010163	-0.002143	0.002144	0.000686	0.028071	-0.035651
(IIa)	0.007094	-0.015304	-0.001326	-0.000983	0.026789	-0.115756
(IIb)	0.032990	-0.069634	-0.005256	-0.004452	0.122031	-0.524867
(III)	0.043128	-0.071750	-0.003120	-0.003760	0.150102	-0.560518
	Exports with Partner (%-change)		**GDP, nominal** (%-change)		**GDP, real** (%-change)	
(I)	0.239033	1.739642	-0.031311	0.053677	0.002144	0.000687
(IIa)	-0.390677	-1.888334	0.075005	-0.102136	-0.001327	-0.000982
(IIb)	-1.772778	-8.532730	0.341510	-0.464057	-0.005273	-0.004431
(III)	-1.533745	-6.793090	0.310199	-0.410380	-0.003130	-0.003744

*) Total welfare = allocation plus terms of trade plus other effects.
(I) = USA subsidizes exports to EU by US$ 4,043 billion over all sectors.
(IIa) = EU reduces imports from USA by US$ 4 billion according to retaliation list of products.
(IIb) = EU reduces imports from USA in order to collect import tariff revenues by US$ 4 billion according to retaliation list of products.
(III) = EU versus USA trade war: Scenarios (I) + (IIb) combined.
Source: Own simulations with the GTAP5 world CGE model.

Simulation results:

The simulation results of the GTAP5 model are presented in Table 4 and can be summarized as follows[10]:

(a) As the amount of the WTO-illegal subsidies involved is much higher than in the former cases (Hormones and Bananas), the impact is also larger in terms of welfare, trade and terms of trade. The retaliatory measures amount to US$ 4 billion which is 1.8% of the total EU trade with the USA. In scenario (I), the isolated effects of the WTO-illegal FSC scheme is simulated. Export subsidies have the classical text book effects. Welfare and terms of trade decreases in the subsidizing country in support of exports. The EU gains in welfare, mainly due to the relatively strong improvement of the terms of trade. US exports

[10] In earlier calculations of the economic impact of the major trade disputes between the EU und the USA, the welfare and trade results were only slightly different to the present calculations. The slight differences might be due to the different CGE models used. Her we use a 12x7x5 CGE world model. In the previous calculations we used a 3 regions, 7 sectors model with 2 factors of production (see Breuss, 2003, p. 166).

to the EU increase by 1.74%. Also EU exports to the US increase slightly. Overall, there is a slight increase in real GDP.

(b) In scenario (II) the variant (IIb) where the EU targets import tariff revenues of US$ 4 billion exhibit stronger effects than variant (IIa). Overall welfare in the EU increases, mainly due to the terms of trade gains. The introduction of retaliatory tariffs, however, deteriorates allocation in the EU. The USA loses welfare. The trade restrictions result in a decline in bilateral exports, whereby the US exports to the EU would shrink dramatically (by 8.5%). Real GDP declines in both countries

(c) The trade war in the FSC case (scenario (III)) would be – due to the high volume of trade policy measures involved - no longer a "mini" trade war. Overall, it seems as the EU would gain this trade war at the expense of the USA. EU welfare and its terms of trade would increase; those of the US would decrease. The former export stimulating effect of the FSC scheme would be more than neutralized in this trade war. Bilateral exports would decline, those of the EU by 1.5% and those of the USA by 6.8%. There would be a Trade Creation effect within the EU because the intra-EU trade would be stimulated by 0.7%.

Besides the impact of the FSC "trade war" on both parties (EU and the US) it is also interesting to study the externalities of this dispute in other third countries. By using a 12 country/region CGE model we can study these third-country effects. It turns out that all other nine regions plus the ROW would slightly improve total welfare in case of scenario (III). However, two countries (Canada and Mexico) and the ROW would have slight negative allocative effects. However, scenario (I) – the simulation of the impact of the FSC scheme of the US alone - leads to welfare losses all over the regions in the GTAP5 model (except for the EU, due to terms of trade gains).

Contrary to the first two cases the FSC induced trade war between the EU and the USA would be of a considerable dimension and it would involve nearly all sectors of both economies with not easy appreciable consequences on welfare, allocation, efficiency, labor markets and change in sectoral competitiveness in both countries. The larger the retaliatory level at stake the plainer one sees the problems with the present practice of sanctions by the WTO-DS system. Without a detailed computable general equilibrium model (CGE) for both countries one is simply not able to evaluate all the economic interactions and consequences of such a trade war.

5. The Steel Case

5.1 An Evolving Conflict with Unknown Level of Damage

On March 20, 2002, the US imposed severe restrictions on steel from the rest of the world with import tariffs as high as 30%. These safeguard measures applied to imports from all countries, except for products of Canada, Israel, Jordan and Mexico, and also for products of developing countries when they are members of the WTO[11]. Given that this left the EU – the world's largest steel producer, with 159 million tons of crude steel (19% of world production) in 2001 - as the only remaining sizeable steel market, this created a serious risk that the EU would be flooded by steel shut out of the US market. The extent of possible trade diversion is estimated by the European Commission as high as 15 million tons per year, 56% of current EU import levels. EU steel imports are already at record levels (imports in 2001 stand at 26.6 million tones, compared to 15.4 million tons in 1997, an overall increase of 73% over the last 4 years).

The EU reacted to the US safeguard measures for steel imports by two actions: (a) introduction of own safeguard measures to avoid trade diversion to the EU market; (b) request of a decision by the WTO (panel).

(a) The European Commission on March 27, 2002 adopted temporary safeguard measures on steel. This regulation measures (Commission Regulation EC No. 560/2002 of 27 March 2002, OJ L85/1) to 15 steel products (the list can be found at the trade portal of the homepage of the EU: http://europa.eu.int/comm/trade/goods/steel/pr_270302.htm). According to the European Commission the safeguard establishes a generous level of steel imports – within which the measures will not apply - based on the highest recent level of imports (2001). Beyond these levels, tariffs will apply varying from 14.9% (for Rebars) to a maximum of 26% (for Alloy Hot Rolled Flat Products)[12]. These temporary measures lasted for a maximum of 6 months. Although the measures are non-discriminatory, in accordance with WTO rules, developing countries were effectively excluded from the measures. They will also not apply to imports from Russia, Ukraine and Kazakhstan.

On September 27, 2002, after a detailed investigation, the European Commission adjusted the safeguard measures and restricted it to seven out of the original 21 products. The EU adopted

[11] For details of the measures and the coverage of products, see http://www.whitehouse.gov/

[12] For each of the fifteen individual products, quota limits were calculated by taking the average import level for the last three years (1999-2001) and adding 10 per cent. The overall effect was to establish the total imports of these products to around the 2001 level. The quotas were allocated using a "first come first served" approach on the basis of customs declarations requiring exporters to prove they have steel ready to export.

definitive safeguard measures on seven steel products[13]. The tariff quotas for the 7 products permit imports to continue at their traditional levels. Only above these quotas would any safeguard duties become payable at a rate between 17.5% and 26.0%. The tariff quotas will be abolished when the US measures are repealed, and in any event will be progressively liberalized over the next three years. The "short list" of retaliatory (safeguard) import tariffs amounted to € 380 million, the "long list" amounted to € 600 million.

(b) The second front on which the EU fights the US steel protectionism is the establishing of a panel at the WTO. The EU requested WTO consultations with the US on its safeguard measures on March 2002. These proved unfruitful. A number of WTO members made similar requests and, on April, 11 and 12, joint dispute settlement consultations were held in Geneva, between the EU, Japan, Korea, China, Switzerland and Norway on one side and the United States on the other.

At the meeting of the WTO Dispute Settlement Body (DSB) on May 22, 2002, the EU requested the establishment of a Panel in view of the failure to reach a solution through consultations. Although the United States blocked this request, WTO rules do not allow any further procedural devices for delay and a Panel was therefore established the special meeting on June 3, 2002.

Following the establishment of a WTO panel on United States – "Definitive Safeguard Measures on Imports of Certain Steel Products" (WT/DS248 (EC) of June 3, 2002, seven other countries requested a panel, which was established under WT/DS249 (Japan) and WT/DS251 (Korea) on June 14, 2002, WT/DS252 (China), WT/DS253 (Switzerland) and WT/DS254 (Norway) on June 24, 2002, WT/DS258 (New Zealand) on July 8, 2002 and WT/DS259 (Brazil) on July 29, 2002. On July 25, 2002 the Director-General appointed Ambassador Stefán Jóhannesson, Mr. Mohan Kumar and Ms Margaret Liang as panelists. The WTO, on July 11, 2003, issued the reports of a panel (requested by the EC, Japan, Korea, China, Switzerland, Norway, New Zealand and Brazil (Co-complainants)), which concluded that the safeguard measures imposed by the United States on the imports of certain steel products (10 steel product groupings) are inconsistent with the WTO Safeguards Agreement and GATT 1994 (see WTO, 2003b). In this panel report of nearly 1000 pages the WTO not only evaluated the US safeguard measures against WTO law but also criticized fundamentally the US trade legislation and supplied an extensive analysis of the world steel market and those

[13] Five of these products are primary steel products, whilst the remaining two are more sophisticated finished products. More than 70.000 people are employed in the manufacture of these seven products in the Community.

in the United States in particular. If the US were to appeal, the resolution of this dispute would be delayed until before the end of the year 2003.

As a counter-action the United States requested a Panel against the EU safeguard measures. On September 16, 2002 a WTO Panel (WT/DS260/4, request of 19 August 2002) was established following a request by the United States against the provisional safeguard measures taken by the European Communities (“EC”) with regard to imports of certain steel products. The US claims that these measures are inconsistent with the EC's commitments and obligations under the General Agreement on Tariffs and Trade 1994 ("GATT 1994") and the Agreement on Safeguards ("Safeguards Agreement"). The measures in question (collectively, the "Safeguard Measures") include Commission Regulation (EC) No 560/2002 of 27 March 2002, as amended by Commission Regulation (EC) No 950/2002 of 3 June 2002, and Commission Regulation (EC) No 1287/2002 of 15 July 2002, as well as any other amendments thereto or extensions thereof, and any related measures.

So far there is no estimation of the damage the EU and the USA have suffered from the counter-safeguard actions in the steel sector. However, on August 23, 2002 the European Commission welcomed the batch of exclusion of steel products of interest to the EU exporters from the US safeguard measures. This reduced the overall impact of the US WTO illegal safeguard measures which will exempt more than 50% of EU exports. Article 8.1 of the WTO Safeguard Agreement requires countries adopting such measures to offer offsetting compensation so as to “maintain a substantially equivalent level of concessions”. When the US safeguard measures were announced, the Commission estimated that they would affect more than US$ 2 billion of EU steel exports. By the new exemptions the level of damage by the EU then would amount to roughly US$ 1 billion. This would be equivalent to 0.4% of the total EU exports to the USA.

5.2 Economic Impact of the Steel EU-US “Mini” Trade War

On the one hand there is until now only a WTO decision on the illegality of the US safeguard measures but not on those of the EU. On the other hand the level of damage on neither party (US and EU) has been determined yet. Therefore we make only some provisional and hence hypothetical simulation experiments with the GTAP5 CGE world model as in the previous cases.

Two scenarios:

(I) In the *first scenario* we simulate the impact of the safeguard measures by the US implemented at March 20, 2002 amounting to an estimated "damage" for the EU by US$ 1 billion. First, the USA increases import tariffs on steel imports from seven industrial countries/regions (EU, EFTA, Turkey, Brazil, China, Japan and Korea; LDCs, and the NAFTA countries Canada and Mexico are exempted from the safeguard measures) resulting in additional import tariff revenues in the USA by around US$ 391 million. According to estimations by the EU Commission the US safeguard measures have caused a potential damage in the EU of around US$ 1 billion in form of reduced steel exports to the US market. Therefore we calibrate the US safeguard measures in order to target a US$ 1 billion steel import reduction from the EU.

The asserted trade diversion effects (reallocation of steel exports from the US market to the EU market) cannot be detected - at least in the aggregate steel sector[14] in the GTAP5 model simulations. An indication that the trade diversion effect must not be large is that the European Commission reduced the number of products for which the EU introduced counter safeguard measures from originally 21 to only 7 steel products.

(II) In the *second scenario* we simulate the introduction of counter-safeguard measures by the EU at an amount of the "long list" by US$ 600 million. These import tariffs are introduced in a non-discriminatory way on steel imports from the USA, Canada, Mexico, Brazil, China, Japan and Korea (excluding EFTA, Turkey and the LDCs). The import tariffs are calibrated for steel imports so as to reach a reduction of EU steel imports from third countries amounting to US$ 600 million ("long" list).

(III) In the *"mini" trade scenario* we combine the scenarios (I) and (II).

Simulation results:

The simulation results of the GTAP5 model are presented in Table 5 and can be summarized as follows:

(a) In scenario (I) the steel safeguard measures introduced by the US have the following implications: With the exception of the EFTA and Turkey all countries/regions targeted by the US safeguard measures suffer a welfare loss. The EU suffers a welfare loss due to misallocation and terms of trade losses. The US improves their terms of trade but suffers allocation losses, resulting in an overall welfare gain. Both countries suffer a slight real

[14] The products concerned by the safeguard measures are very specific and cannot be captured properly in the GTAP5 model.

GDP loss. Bilateral trade will decline, more so the exports of the EU to the US than the other way round.

(b) In scenario (II) the counter-safeguard measures by the EU have the following effects: The overall welfare of the EU increases (those of the US decreases) due to the terms of trade improvements resulting from the retaliatory import tariffs on steel products. However, there are negative allocation effects. Bilateral trade between the EU and the USA declines. Real GDP will slightly decrease in both countries. The safeguard measures of the EU will lead to a trade creation effect in so far as the intra-EU imports increase.

The welfare implications for the other regions are as expected. Those regions which are exempted from the safeguard measures by the EU – EFTA, Turkey, LDCs – will gain welfare, the others will lose.

(c) The mini-trade war scenario (scenario (III) - with our hypothetical amounts of damages implemented - would have the following outcome: There would be welfare losses on both sides of the Atlantic ("shooting in their own feet"). The terms of trade would improve in the US and decline somewhat in the EU. However, bilateral trade would decline by 5% and 3% respectively. Real GDP would be slightly down in both countries. A further implication of the "mini trade" steel war between the EU and the USA is that EU exports will be diverted from the US to other world regions. The same is true for the US, although not in such an intensity as in the case of the EU.

The third-country impact on welfare is similar to those of scenario (II). However, now, also Canada and Mexico can gain welfare in case of an EU-US steel trade war.

Table 5: "Mini" Trade War EU versus USA: Steel Case

Scenarios	**Welfare Total*)** (as % of GDP)		**Welfare Allocation** (as % of GDP		**Terms of Trade** (%-change)	
	EU	**USA**	**EU**	**USA**	**EU**	**USA**
(I)	-0.003174	0.001096	-0.000614	-0.000412	-0.008291	0.013025
(II)	0.001407	-0.001559	-0.000233	-0.000115	0.005293	-0.011616
(III)	-0.001766	-0.000463	-0.000847	-0.000527	-0.002998	0.001410
	Exports with Partner (%-change)		**GDP, nominal** (%-change)		**GDP, real** (%-change)	
(I)	-0.467466	-0.110962	-0.016206	0.013390	-0.000614	-0.000412
(II)	-0.066176	-0.193604	0.012271	-0.010098	-0.000233	-0.000115
(III)	-0.533642	-0.304573	-0.003936	0.003291	-0.000847	-0.000527

*) Total welfare = allocation plus terms of trade plus other effects.

(I) = USA introduces safeguard measures for steel imports (import tariffs by 30%; steel import reduction from EU by US$ 1 billion)

(II) = EU introduces counter-safeguard measures for steel imports (import tariffs for 7 products; steel import reduction from third countries by US$ 600 million)

(III) = EU versus USA trade war EU-USA: Scenarios (I) + (II) combined.

Source: Own simulations with the GTAP5 world CGE model.

Although the US government already made considerable concessions by excluding nearly half of the products initially sheltered, the new Steel dispute is still not yet settled. Also a decision by the WTO Dispute Settlement Body can be expected in the near future as how large the real damage on both side of the Atlantic will be.

6. How to Improve the WTO-DSU Sanctions Mechanism?

The WTO DS system is in place since 1995 and has already gathered a considerable amount of practice. Most of the cases dealt with ended with the implementation of the trade policy measures which comply with WTO rules as demanded by the WTO DSB. Until now, only three cases ended with the authorization for trade sanctions (the Hormones, the Bananas and the FSC case). In the present three cases the rivals are the USA and the EU as well as Canada and the EU, and Ecuador and the EU respectively.

There are a lot of legal and economic reasons for reforming the WTO-DSU system. In the run-up to the Fifth Ministerial Conference of the WTO at Cancun (Mexico, September 10-14, 2003) the progress of the Doha Round will be reviewed. Also the DSU system will be reformed. In the following we concentrate primarily on the economic peculiarities of the present DSU system (see also Anderson, 2002). Based on the present practice and the findings of our economic evaluation one can draw the following conclusions:

- *The calculation of damages:* The present cases showed that the estimation of the correct level of the suspension of concessions "equal to the nullification or impairment" is practically impossible. The calculation always involves the comparison between the actual situations with one hypothetical in which the trade measures would be WTO-legal. In both cases one has to estimate practically all parameters. A small change in the assumption of only one parameter results in considerable changes of the final result. As such calculations always have to be made under uncertainty one should at least do this exercise under two conditions: (a) The Arbitrators should make sensitivity analyses when fixing the level of impairment; (b) much more transparency is necessary (a good example is the Hormone case, a very bad example is the Bananas case). The concept of equivalence draws more on notions of fairness than on economic accuracy. As Anderson (2002) demonstrated theoretically (see also Figure 1 in the Annex) and we calculated via model simulations in

this paper, "trade loss equivalence would never translate into equivalent damage to economic welfare, except by coincidence". This can be seen by the unclear statements of the WTO arbitrators when specifying the value of the damage. The so estimated damage is always a static approximation to a possible loss by the complainant. If he is allowed to introduce retaliatory import tariffs in the amount of the "damage" this will enhance reactions by importers and will reduce the targeted tariff revenues. Also in an other respect the WTO dispute settlement system is flawed. Not only does it favor larger countries because they have better access to this procedure than smaller and poor countries. It only looks at future actions. Past wrongs go uncompensated. Trade retaliation under WTO only target non-compliance after the "reasonable period of time" has elapsed following a Panel or Appellate Body finding against a respondent's wrong policy regime. The damage done in preceding years to the complainant's export industry is simply ignored by DSU procedures. Further more, by retaliating it is the complainant's import-competing industries that enjoy temporary assistance because of the prohibitive retaliatory tariffs imposed. This does not help the export industry that has been denied market access by the respondent's wrong policy in the first place.

- *Controlling:* Besides the problem of calculating the level of damage a country suffers from another not complying with WTO rules, a question – overlooked by the DS architects – concerns controlling. Once the amount of impairment is set by the Arbitrators in the WTO DS procedure, who controls ever whether the country who has the allowance to retaliate (e.g. in the case of hormones and bananas the USA) really only cashes in the amount decided by the WTO? In reality it is nearly impossible to split up the tariff revenues in "normal" and "retaliated" tariff revenues or if one takes into account the ambiguity of the WTO Arbitrators wording the amount (value) of imports.
- *Questionable system of compensation:* The present sanctions practice of the WTO DSB is to allow complainants to impose tariff measures. Theory and the empirical evidence (via simulations with CGE trade models) suggest that import tariffs may lead to a trade war. Trade wars can only be won by large (and hence, powerful) countries. This is the result of optimum tariff theory and more recent theoretical analysis (see Grossman-Helpman, 1995; Breuss, 2003). That means that small (and more so, poor LDCs) countries are discriminated in two respects. On the one hand, due to a lack of legal resources they can make less use of the WTO DS system. On the other hand, if they are authorized to retaliate against a large country or trading bloc (like the EU), they do no implement such sanctions (e.g., Ecuador in its "cross-retaliation" case against the EU) either because they

fear to lose the trade war or to lose the necessary aids from the large country (e.g., from the EU) or they hope for preferential treatment in debt negotiations in the Paris Club. Countermeasures in form of retaliatory tariffs are hence bad policy. They amount to "shooting oneself in the foot" (see Mavroidis, 2001, p. 46). Through countermeasures, at least a small and poor WTO member imposes an additional cost on society. Precisely because of the budgetary constraints, adoption of countermeasures is simply not an option for the poorer WTO members. The present system of compensation in the WTO illustrates the disadvantageous position of LDCs. Even "cross-retaliation" in the area of TRIPS, which may have seemed to more promising from the perspective of compliance-seeking developing countries, does not offer them the relief they hoped for, as can be seen in Ecuador's experience in the Bananas dispute with the EU (see Bronckers, 2001, p. 61; Breuss, Griller, and Vranes, 2003).

- *Retaliations have incalculable impacts:* Retaliatory measures via import tariffs have a whole series of incalculable and unpleasant impacts. The Hormones, the Bananas and the FSC cases have demonstrated that retaliatory measures tend to injure a motley assembly of exporters and importers, often smaller companies, who rarely, if ever, have an interest in the original dispute (e.g., Bananas against luxury bags from "Gucci". As Bronckers (2001, 62) reports, "these companies have a point when arguing that any damages paid for WTO violations by a non-complying country ought to be paid from public funds, rather than by an arbitrary selection of individuals". If the group of small companies has also a small lobbying power the responsible Commission and the Member states of the EU are not inclined to change a WTO-illegal regime[15]. Besides these anecdotal remarks one can strictly prove from general equilibrium analysis of trade policy measures that the imposed tariffs on a randomly selected list of products (sometimes aggravated by a "carousel" method) can have implications which are not foreseen by WTO Arbitrators if they do not dispose of a very detailed CGE world trade model. The larger the retaliatory measures (e.g. demonstrated in the FSC case) the bigger the negative allocative impact on the different sectors and the larger the allocative inefficiency caused. As long as such model devices are not at hand, the WTO DSB decisions on retaliatory tariffs are irresponsible. Not only, they disadvantage small and poor WTO members but also they can not fully estimate the economic consequences for the parties involved in the dispute directly, but also indirectly the impact on third countries not participating in the dispute (third country externalities). Furthermore, even if one accepts the estimated level of trade sanctions,

presently, nobody is controlling whether the sanctioning country really collects exactly the amount it is allowed to, or more. Practically, this is an impossible game, as an administration cannot clearly differentiate which part of tariff revenues is retaliatory in nature and which is normal. Additionally, who controls the distribution of these retaliatory tariff revenues to the companies suffered damage? Tariffs are therefore very bad instruments for countermeasures. Although "the right to request financial reparation for a wrongful act, including damages incurred in the past, is a basic principle of international law in case compliance is not possible" (Bronckers, 2001, p. 62), the question is the method in which sanctions should be executed.

- *From tariff to transfer sanctions:* Due to the negative and often incalculable impact a much more efficient and easier retaliation instrument than tariffs would be direct transfers (lump-sum penalties) from the government of the non-complying country to the government of the country having got the authorization of compensation by WTO. The latter government could than easily redistribute the received transfers to the companies which suffered the concrete loss. Whether transfers as retaliatory measures would also be covered by the present DSU legislation is an open question. Article 22.1 DSU never speaks about tariffs explicitly but only on "compensation and the suspension of concessions or other obligations". Suspension of concessions implies, however, tariffs as the major part of concessions in former GATT rounds consists of tariff reductions. One could (newly!) interpret "other obligations" as the duty of countries not complying with WTO rules to pay transfers to the countries hurt by the non-compliant action. This should be a recoverable claim, determined by the usual DSU procedure. The problem, however, is that the complainant would interfere into the national autonomy of the respondent which is excluded from the present WTO system.

A somewhat other suggestion was put forward by Anderson (2002). He pleads for compensation instead of retaliation. A complainant unhappy with the respondent's policy reform should be entitled to seek compensation until satisfactory reforms are implemented. Compensation could come in the form of a temporary lowering of the respondent's import barriers on some other products, which should be offered on a most-favored-nation (MFN) basis. Instead of the restrictive effect of retaliation to both countries involved in the trade dispute, compensation in this form would simply mean trade liberalization. According to Anderson (2002) the concept of compensation would not only favor the complainant but also third countries and by granting compensation, the respondent would gain greater

[15] As Bronckers (2001, p. 62) mentions, various European companies, struck by US retaliatory measures, had

control of procedures. With retaliation, by contrast, the complainant can keep pressure on the respondent until the latter complies.

Overall, the sanctions – as intended in Article 22.1 DSU they should only be temporary – had at least succeeded in the Bananas case. Here, the EU came to an agreement with the USA in implementing a new regime which satisfies both sides. In the Hormones case, the EU is still belated in abolishing the ban on imports of US beef. The matter is complicated insofar as (a) it is difficult to proof that hormone treated meat can cause cancer (the time of experience is to short), and (b) the European consumers simply refuse to eat hormone treated meat. If this were really true, then no ban on US meat would be necessary, given that the meat sold in European shops is label as hormone treated. In the FSC case, the EU is allowed to impose retaliatory measures. It is, however, waiting for compliance of the US government. If implementing the US$ 4 billion measures this would hamper bilateral trade more than any other trade dispute. Still open is the outcome of the steel dispute. In any case there are not signs that the transatlantic trade relations are improving. On the contrary, the recent file of the US government against the EU over its illegal five-year moratorium on approving agricultural biotech products (GMOs) underlines that the pessimists could become right.

considered filing damage claims against the European institutions pursuant to Article 288 EC Treaty.

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Annex:

Table A.1: The WTO Dispute Settlement Cases, 1995-2002
Total and Breakdown by Types of Countries

	Defendants				
Complainants	**U.S.**	**EC**	**DCs**	**Others**	**Total**
U.S.	-	30	29	15	74
EC	22	-	27	9	58
DCs	37	27	38	8	110
Others	22	8	13	14	57
Total	81	65	107	46	299

Source: De Bievre, Horn, and Mavroides, Messerlin, WTO

Table A.2: The EC-U.S. Dispute Settlement Cases, 1995-2002
Sectors targeted

	U.S. as complainant	**EC as complainant**	**Total**
Agrifood	10	3	13
Steel	2	6	8
Textiles	-	2	2
Chemicals	-	1	1
Electronics	3	1	4
Services	8	1	9
Various	7	4	11
U.S. laws	-	4	4
Total	30	22	52

Source: Messerlin, WTO

Table A.3: The EC-U.S. Dispute Settlement Cases, 1995-2002
Instruments targeted

	U.S. as complainant	**EC as complainant**	**Total**
Tariffs	4		4
Import regime	3	3	6
Customs issues	3		3
Antidumping	-	4	4
CVDs	1	2	3
Safeguards	1	3	4
Export measures	1	-	1
Norms	1	-	1
Service regulations	3	1	4
TRIPs	8	1	9
Gov.procurement	-	1	1
U.S. laws	-	7	7
Total	30	22	52

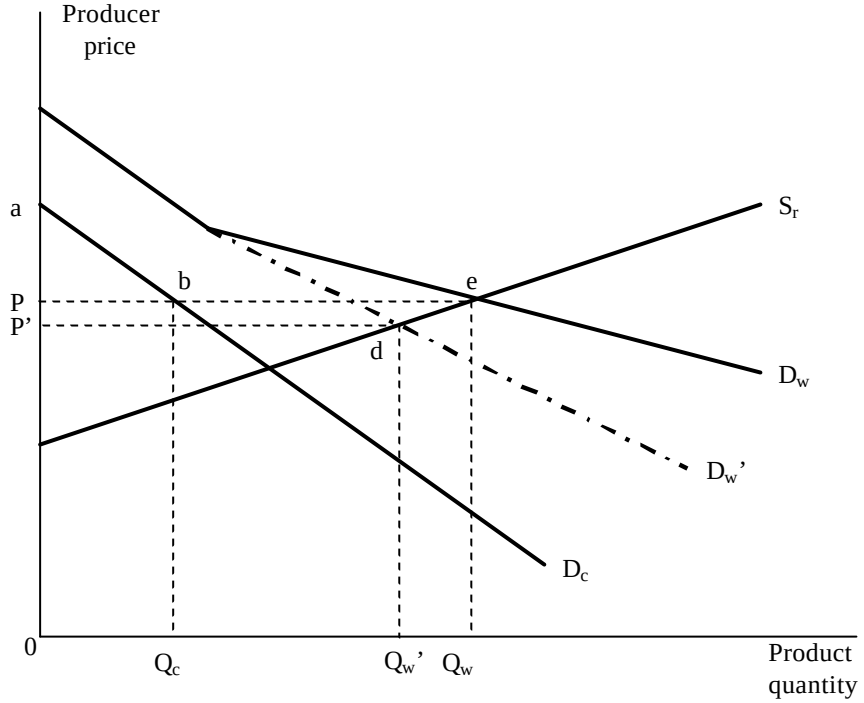
Source: Messerlin, WTO

Table A.4: Model Structure of the GTAP5 World Model used in the simulations

12 Countries/Regions	**7 Commodities/Sectors**	**5 Factors of Production**
USA, Canada, Mexico, EU, EFTA, Turkey, Brazil, Latin America, China, Japan, Korea, ROW	Bananas, Meat, Food, Other Primaries, Steel, Manufactures, Services	Land, Unskilled Labor, Skilled Labor, Capital, Natural Resources

Source: Dimaranan, B.V., McDougall, R.A. (Eds.): Global Trade, Assistance, and Production: The GTAP 5 Data Base, Purdue University, May 2002.

Figure 1: The effects of retaliation for the complainant and the respondent



D_c is the complainant's (e.g. the US in the bananas case) import demand curve for a product imported from the respondent (e.g. luxury goods from the EU). D_w is the world's import demand for it. If S_r is the respondent's excess supply curve for that product; then in the absence of distortions and assuming perfect competition, the international price of the product will be P and the quantity traded will be Q_w, of which Q_c goes to the complainant.

Retaliation means in the extreme a prohibitive (100%) tariff which reduces Q_c to zero. This will cause the global demand for the respondent's exported product to shrink to D_w'. This horizontal shift will be by less than the full extent of D_c because the complainant will demand more close substitutes in the world market, driving up their price and hence shifting out to some extent the demand curve of the rest of the world for the respondent's export product. The international price of that product will fall to P' and the volume of the respondent's exports will fall from Q_w to Q_w', that is, by less than OQc.

The gross value of the imports to be prohibited is the area PbQ_cO, whereas the respondent's net loss of export earnings from this product is the smaller area $PeQ_wQ_w'dP'$.

The respondent's economic welfare loss because of the trade prohibition is just the area PedP', since the area under the respondent's export supply curve between points d and e represents costs of production which would not be borne if the respondent's export volume was reduce by $Q_w'Q_w$.

The economic welfare loss to the respondent is larger absolutely, and relative to the gross value of trade curtailed, the steeper (i.e. the less price elastic) is S_r, the respondent's export supply curve, between the free market equilibrium point e and the constrained equilibrium point d. Hence the ratio of PedP' to PbQ_c0 would vary across products.

This underscores the point that ensuring the reduction in the value of imports from the respondent, due to retaliation, matches the reduction in the value of imports from the complainant, due to the WTO-inconsistent measure being used by the respondent, will not be (except by coincidence) the same as ensuring equivalent losses in economic welfare for the other party due to the import restriction each is imposing.

Source: Anderson (2002)