Journal of Industry, Competition and Trade, Bank Papers, 275–315, 2004

WTO Dispute Settlement: An Economic Analysis of Four EU–US Mini Trade Wars—A Survey

FRITZ BREUSS* Fritz.Breus@wu-wien.ac.at or Fritz.Breuss@wifo.ac.at
Europe Institute, Vienna University of Economics and Business Administration, Althanstrasse 39-45, A-1090, Vienna, Austria
Austrian Institute of Economic Research, P.O. Box 911, A-1103, Vienna, Austria

Abstract. Since its inception in 1995, more than 312 disputes have been raised under the WTO Dispute Settlement System. Despite the obvious success of this system, several shortcomings call for a revision under the auspices of the Doha Development Round. With a computable general equilibrium model we analyze the four most prominent trade disputes between the EU and the USA, which we call "mini trade wars:" the Hormones, the Bananas, the Foreign Sales Corporations and the Steel cases. The economic analysis revealed several flaws and peculiarities: As a rule, retaliatory tariffs are detrimental to welfare of the retaliating country and amount to "shooting oneself in the foot." Trade wars can only be won by large countries. The WTO arbitrator's estimation of the trade loss in case of non-compliance never translates into equivalent damage to economic welfare. A mechanism to control the collection of retaliatory tariff revenues is missing as is a system to compensate the firms suffering the damage. The major conclusion therefore is that tariffs are very bad instruments for countermeasures. The sanctions mechanism of the Dispute Settlement System should be improved, maybe based on a mechanism of direct transfers.

Keywords: WTO dispute settlement, trade policy, CGE model simulations

JEL classification: F13, D58, K33

1. Introduction

One of the unique features of the WTO if one compares it to other international organizations is dispute settlement. Since its inception on 1 January 1995 up to June 2004, 312 disputes have been raised under the WTO Dispute Settlement Understanding (DSU).[1] Most complaints (185) involved developed WTO Members and were targeted against other developed countries (more than 117). More than 100 complaints were lodged by less-developed WTO Members. Most of the cases dealt with ended with the implementation of the trade policy measures which comply with WTO rules as demanded

* I want to thank Kym Anderson and Gunther Tichy for their very helpful and constructive comments on an earlier version of this paper. Werner Zdouc (Counsellor, Appellate Body Secretariat at the WTO) has provided me with valuable legal advice.

1 Complete lists and summaries of these cases are to be found in the regular Overviews/Updates of WTO Dispute Settlement Cases, WTO documents WT/DS/OV/1-20 on the WTO homepage: http://www.wto.org. A systematic compilation of all DS cases since 1995 can be found in the Annex tables to Bagwell et al., 2004).

by the WTO Dispute Settlement Body. The WTO DSU has been involved in 312 cases leading to consultations, panel proceedings, appellate review or arbitration on complaints by WTO Members.[2] In 54 cases, mutually agreed solutions were notified to the Dispute Settlement Body. In about a dozen of other disputes, the complaints were formally withdrawn. Dispute settlement panels were established in 113 cases, but actually composed in only 88 cases. Panel reports were adopted in 71 cases. The launching of the Doha Development Round negotiations in 2001 coincided with a decline in the number of panel proceedings. In the early years of the WTO, almost all panel reports were appealed. By 2003, the frequency of appeals had decreased to 60%. The average length of appellate review proceedings remained below the maximum time period of 90 days (see Petersmann, 2004, p. xvii).[3]

Whether the WTO Dispute Settlement System was more successful than the former GATT is an open question. Some (e.g. Petersmann, 2004, p. xvii) find that the WTO system was more successful than those of GATT, others questions this position. In comparing the GATT and the WTO dispute settlement systems Busch and Reinhardt (2003) conclude that the probability of a rich-country complainant to win full concession has improved unambiguously under the WTO, whereas the respective probability of a poor-country complainant has remained broadly the same under both systems. This underlines the opinion of many critics that there is 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 et al., 1999; Bagwell et al., 2004). According to Besson and Mehdi (2004) developing countries are unlikely to win disputes because of asymmetric legal capacity and economic dependence via bilateral assistance and other international politics factors. Holmes et al. (2003), however, question that there is evidence of a bias against developing countries.

The complexity of WTO dispute settlement proceedings is underlined by the fact that, since the beginning in 1997 of the ''full review of dispute settlement rules and procedures under the WTO'' mandated by the 1994 Ministerial Decision on the Application and Review of the DSU, numerous proposals for improving and clarifying the DSU have been made and discussed in WTO bodies (see e.g., Bronckers, 2001 and the many contributions in Ortino and Petersmann, 2004). Following the Doha

2 The various stages (the panel process) a dispute can go through in the WTO are summarized in a flow chart on the WTO homepage: http://www.wto.org/english/thewto_e/whatis_e/tif_e/disp2_e.htm. The legal basis of the WTO Dispute Settlement System is ''Annex 2'' of the Uruguay Round Agreements of 1994: ''Understanding on Rules and Procedures Governing the Settlement of Disputes'' (or in short: Dispute Settlement Understanding, DSU). See ''WTO legal texts'' on the WTO homepage: http://www.wto.org/english/docs_e/legal_e/legal_e.htm#finalact.

3 A comprehensive analysis of the legal aspects of the Dispute Settlement System 1995–2003 can be found in Ortino and Petersmann (2004). In WTO (2004a) the WTO Secretariat has prepared a guide to explain the practices that have arisen in the operation of the WTO dispute settlement system since its entry into force on 1 January, 1995. Palmeter and Mavroidis (2004) cover the DS system from a practical and procedural point of view.

Declaration of 20 November 2001 and the launching of the Doha Development Round negotiations early in 2002, the Dispute Settlement Body (DSB) has held many formal, as well as numerous informal ''special sessions'' during which the proposals for improving and clarifying the DSU were made and discussed by WTO Members, touching on almost all DSU provisions.[4] Most of these proposals refer to institutional and/or procedural changes; rarely do they touch intrinsic economic problems with the DS system. The reason for the lack of proposals to improve the WTO DS system from an economic point of view may be due to the fact that WTO issues are primarily a playground for lawyers.

There are only a few explicit theoretical and some empirical contributions to explain the economic reasoning of the GATT/WTO (e.g. Hungerford, 1991; Rodrik, 1995; Staiger, 1995; Bagwell and Staiger, 1999, 2002; Spagnolo, 2001; Bütler and Hauser, 2000; Anderson, 2002; Horn and Mavroidis, 2001) or of the system of dispute settlement (e.g., Maggi, 1999; Bown, 2002, 2004). 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 and 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 and 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 primarily large countries will win trade wars (e.g. Whalley, 1985, chapter 14; McMillan, 1986; Kennan and Riezman, 1988; Breuss, 2003).

2. The actual transatlantic WTO trade disputes

Since 1995, around 312 bilateral disputes were filed with the WTO.[5] As complainants, 19.4% of which concern the EC, 24.8% the USA, and the rest is distributed to other countries, each involved not more than 9%. As respondent, 27.1% concern the EC,

4 A list of the several proposals made by WTO member states can be found on the European Union's Trade Issues homepage: http://europa.eu.int/comm/trade/issues/respectrules/dispute/improving/index_en.htm, and in an internal WTO compilation of draft text proposals (see WTO, 2003a).

5 Holmes et al. (2003, Table 10) find that complainants overwhelmingly win (88% of the completed cases). However, the US won only in 40% of the cases against the EU, whereas the EU won in 91% of the cases against the US. Canada and the US have won in only 67% or 76% of the cases, compared to the average of 88% winning cases.

21.7% the USA, and the rest concerns other countries, each not more than 8% (see Table A.1 and Horn et al., 1999). At present,[6] the EC is actively involved in 26 WTO disputes: in 16 of these cases the EC is the complaining party while in the remaining 10 cases the EC is on the defending side. In 32 cases the EC is third party. Those 26 cases relate to the EC's relations with 8 of its trading partners (Argentina, Australia, Brazil, Canada, India, Korea, 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 (see also WTO, 2003e). In 10 of these cases it is the Community which is the complaining party, being the defendant only in 3 cases.[7]

(I) The EC is defendant against the US in the three cases: *Hormones* (Dispute Settlement case, Nos. DS48 and DS26; procedural stage: implementation); *Protection of trade marks and geographical indications for agricultural products* (DS174; procedural stage: panel); *Measures affecting the approval and marketing of certain biotech products (GMOs*; DS291; procedural stage: panel).[8] In each bilateral EC–US case a varying number of other states act as third parties (for historical statistics, see Tables A.1–A.3 in the Annex).

(II) The EC is the complaining party against the US in 10 cases:[9]

(II.1) *Cases on Trade Defence Instruments and Subsidies*:

(1) The *US Anti-Dumping Act of 1916* (DS136; procedural stage: implementation) prohibits the importation and sale of goods ''at a price substantially less than the actual market value in the principal markets of the country of their production.'' This was judged to be in breach of

6 As of 30 June 2004 (see European Commission, 2004). For details, see also the homepage: http://europa.eu.int/comm/trade/issues/respectrules/dispute/index_en.htm.

7 The asymmetry in the transatlantic trade relations concerning the compliance with WTO dispute settlement recommendations is also mirrored in many other barriers to trade and investment, mentioned in the 2003 report by the European Commission (2003).

8 On May 2003, the US, together with 16 other countries as third parties have brought a WTO challenge against the EU concerning EU actions and behaviour with regard to genetically-modified organisms (GMOs). The EU is defending the legitimate right of each State to establish and apply a regulatory regime to ensure that GMOs are only put on the market on the basis of a careful assessment of risks, appropriate control and monitoring measures, and proper information to consumers. The EU denies that there is a ''moratorium'' in the EU. The assessment procedures of new GM products have never been stalled. On 25 June 2004 the European Commission proposed authorisation of NK603 maize. Foods and foot products derived from NK603 maize can be placed on the market. The authorisation is valid for 10 years. Labelling and traceability is assured. An overview of EUs GMOs regime can be found in ''Questions and answers on the regulation of GMOs in the EU,'' MEMO/04/102, European Commission, Brussels, 19 May 2004. On 8 September 2004 the European Commission for the first time approved the inscription of 17 GM varieties derived from MON 810 maize in the Common EU Catalogue of Varieties of Agricultural Plant Species. Seed of varieties in the Common Catalogue can now be marketed in the entire EU, seed of varieties in the national catalogues only on the market of the country concerned (e.g. 6 are listed in France and 11 are listed in Spain; MON 810 maize has been approved in these countries since 1998).

9 See the Fact sheet published by the European Union on the occasion of the EU–US Summit, Dromoland Castle, Ireland, 26 June 2004 and European Commission (2004).

WTO rules in September 2000. On 24 February 2004, the WTO arbitrators accepted the EU request to suspend the application to the US of its obligations under GATT, 1994 and the Anti-Dumping Agreement. The EU sanctions would take the form of a specific legislation applicable to dumped imports from the US and mirroring the US 1916 Anti-Dumping Act. The EU mirror legislation would entitle companies in the EU to bring complaints against US companies under the same basic condition as those required under the 1916 Anti-Dumping Act. The EU still waits for US compliance.

(2) The *Continued Dumping and Subsidy Offset Act of 2000* (or ''CDSOA''—also known as the *Byrd Amendment*; DS217; procedural stage: implementation) signed into law in October 2000 provides that proceeds from anti-dumping and countervailing duties shall be paid to the US companies responsible for filing the cases. The payment redistributed to US producers is substantial and has tended to benefit a very limited number of recipients, mainly in the steel sector, thus increasing their distorting effects on competition. This provision was found incompatible by WTO with several WTO provisions on 27 January 2003; in particular CDSOA is an illegal response to dumping or subsidisation and therefore WTO incompatible. The EC together with Brazil, Canada, India, Japan, Korea, and Mexico requested the authorisation to impose retaliatory measures (additional import duties on US products). Two bills are pending in Congress to repeal the CDSOA or replace it with a new adjustment assistance programme. On 31 August 2004 the WTO Arbitrators have given green light for eight WTO members to retaliate up to more than US$150 million against the USA. The arbitrators determined (for the first time) a variable level of suspension of concessions or other obligations. Based on an economic model a coefficient was defined by which future disbursements under the CDSOA would be multiplied to reach the value of the trade effect. Accordingly, the level of nullification or impairment corresponds in the case of the European Communities and for a given year, to the following: ''Amount of disbursements under CDSOA for the most recent year for which data are available relating to anti-dumping or countervailing duties paid on imports from the European Communities at that time, as published by the United States' authorities, multiplied by 0.72'' (see WTO, 2004b, pp. 40–41).

(3) *US countervailing measures on privatised EU firms/follow-up to the British Steel* case (DS212; procedural stage: implementation). This methodology used by the US Department of Commerce in imposing countervailing duties on privatised exporters had been found WTO incompatible. The ''new'' methodology introduced by the Department of Commerce was just as much WTO incompatible, prejudicing the interests of EU exporters. The EU was forced to challenge the new methodology at the WTO (the so-called ''Privatisation Case'' covering all 14 privatisation

cases affected by the US methodology). In this ''new'' case (DS212) the WTO has again ruled in favour of the EU and set a deadline (8 November 2003) by which the US should comply with this ruling. The US action, embodied in the new ''privatization methodology'' is only partially satisfactory and leaves unresolved several measures against EU exporters. Therefore the EU has requested Art. 21.5 DSU consultations with the US, which took place on 24 May 2004.

(4) *US application of de minimis rules in AD/CVD sunset reviews* (DS213; procedural stage: implementation). In this case, the US Department of Commerce (DOC) has recommended continuation of Anti-dumping (AD)/ Countervailing duty (CVD) measures, in spite of the amounts of dumping and subsidy being below the current de minimis level. The case concerns corrosion resistant steel from Germany. The WTO panel established by EC request has found that the US measures are inconsistent with the WTO Agreement on Subsidies and Countervailing Measures (SCM) . On 1 April 2004, the US repealed the measures at issue.

(5) *US Foreign Sales Corporation (FSC) case* (DS108; procedural stage: implementation) is the most prominent one. This legislation which we deal with explicitly below had the purpose to encourage the export of US manufactured goods via export subsidies, prohibited under the WTO.

(6) *US sunset reviews on certain steel products* (DS262; procedural stage: consultations). On 8 December 2000, the US decided to maintain for afurther five years the anti-dumping and countervailing duties imposed in August 1993 on cut-to-length steel plate from Germany and corrosion-resistant steel from France and Germany. Consultations were held on 12 September 2002.

(7) *Zeroing methodologies in the establishment of dumping margins* (DS294; procedural stage: panel). The US DOC calculates the dumping margin using the methodology condemned in the Bed linen case. This methodology consists in disregarding negative dumping margins established for certain models of the product concerned (put a zero). The US refuses to abandon its methodology. This, however, is not foreseen by the WTO Anti-dumping Agreement. A panel was established in 19 March 2004.

(II.2) *Cases on Intellectual Property Rights (TRIPs Agreement)*:

(8) *Section 110(5) of the US Copyright Act* (''Homestyle exemption''; DS160; procedural stage: implementation). On 27 July 2001, the DSB found that *Section 110(5) of the US Copyright Act* was incompatible with WTO rules. The US failed to comply with the ruling. In June 2003, the US and the EU notified to the WTO a temporary arrangement (expiring in December 2004), pending full US compliance with the WTO ruling.

(9) The *Section 211 of the Omnibus Appropriations Act* (''Havanna Club,'' DS176; procedural stage: implementation) prohibits the registration or renewal of a trademark previously owned by a confiscated Cuban entity

and sets forth that no US court shall recognise or enforce any assertion of such rights. Again the Dispute Settlement Body ruled that this legislation breached WTO rules. In the latter two cases the EU accepted to extend the deadline for implementation and to suspend the arbitration on its request for retaliatory measures. There are currently three bills pending in Congress to repeal the 1916 Anti-Dumping Act. In June 2003 a bill (''US–Cuba Trademark Protection Act of 2003'') was introduced in the House to repeal Section 211 and a Companion bill was introduced in the Senate in December 2003, but, none has been adopted.

(10) *Section 337 of the 1930 Tariff Act on Copyright* (DS1986; procedural stage: consultations). Section 337 of the U.S. Tariff Act declares the importation into the U.S. of articles infringing U.S. intellectual property rights illegal. In 1989, a GATT panel already condemned Section 337, which was subsequently amended. However, the amendments were only partial and clearly insufficient. WTO consultations took place on 28 February 2000, with no positive outcome. Since then, the U.S. International Trade Commission (ITC) has started new investigations against a number of European and Canadian companies.

(II.3) *Cases dealing with US unilateralism*:

(11) *Carousel* (DS200; procedural stage: consultations). As soon as sanctions are rotated, the EC would immediately request the establishment of a panel against the US legislation. The two situations where the US Trade Representative (USTR) is not obliged by law to rotate the carousel are (1) when there is a determination of imminent compliance, or (2) when the affected industry agrees not to rotate the sanctions.

With the joint request for consultations concerning the prohibited subsidies provided to European and US producers of large civil aircraft (LCA)—in the Airbus-Boeing case—the United States (DS 316) and the European Communities (DS 317) started a new potential large transatlantic trade conflict on October 12, 2004.

In the following economic analysis we concentrate on the four most prominent disputes between the EU and the US. The cases are: *Hormones* (DS26), *Bananas* (DS27), *FSC* (DS108) and *Steel* (DS248). Two of them escalated into retaliatory actions (Hormones and FSC). The bananas case—after a longer period of countervailing actions by the US—has been settled as of 1 January 2002. The Steel dispute has been settled before the WTO arbitrators authorized the complainant parties to apply countermeasures against the United States. Out of the large number of DS cases, in only seven occasions the WTO-Dispute Settlement authorities (Arbitrators) allowed the complainant party to introduce retaliatory measures against another WTO member (see Ortino and Petersmann, 2004, p. xviii). Three cases concerned EU–US trade dispute, namely the Hormones case, the Bananas case and the FSC case.

The structure of this paper is as follows. In the next section, the history, the dimension and the economic impact of the four trade disputes are analysed in detail. After a historic evolution of the disputes and their treatment by the Dispute Settlement System the Dispute

Settlement procedure is critically evaluated. Then the welfare and trade effects of these trade conflicts, which can be called ''mini trade wars,'' are quantified by simulations with a computable general equilibrium model (GTAP5) which is designed for our purpose to a 12 regions, 7 sectors and 5 factors of productions world model. The final sections summarize the major findings and make suggestions for possible improvements of the Dispute Settlement System in general and its present sanctions mechanism in particular.

3. History, dimension and economic impact of four EU–US mini trade wars

3.1. The hormones case[10]

3.1.1. The history

In 1996, the USA and Canada held formal consultations in the framework of the WTO dispute settlement mechanism 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 (Sanitary and Phytosanitary) (2, 3, 5), TBT (Technical Barriers to Trade) (2), Agriculture (4)). The EC measures (prohibiting the importation of meat and meat products that have been treated with growth hormones; 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) 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.

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 tariff concessions covering trade in an amount of US$202 million per

10 Widsten (2004) analyses two transatlantic agricultural disputes: the new WTO Beef Hormones case and the old (1980s) Oilseed dispute under GATT from a politico-economic point of view. Bagwell and Staiger (2001) find that the ongoing agricultural trade disputes may be best interpreted from the perspective of strategic-trade theory. In fact, these disputes may offer the most important example yet of strategic-trade theory.

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, and, on July 12, 1999, the WTO Arbitrator determined that the level of nullification or impairment[11] suffered by the USA and Canada was *US$116.8 million per year* (WTO, 1999b) and *CND$11.3 million per year* (WTO, 1999c), respectively. The retaliatory tariff measures by the USA concern the same sector (Agriculture) and concern a variety of EC agricultural products.[12] 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!

3.1.2. How to calculate the level of damage?

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. First, they say that the proposed figures by the USA are too 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

11 The notions ''nullification'' or ''impairment'' are widely used legal terms in the DSU. This means that a breach of the rules has an adverse impact on the other Member parties. ''Nullification'' and ''impairment'' can be understood as ''annulment or abolition'' (of agreements) and (economic) ''damage'' respectively. Art. 22 of the DSU lays down the principles of ''Compensation and the Suspension of Concessions'' in case a Member does not comply with WTO rules. Art. 22, paragraph 4 states ''The level of the suspension of concessions or other obligations authorized by the DSB (Dispute Settlement Body) shall be equivalent to the level of the nullification or impairment.''

12 The list of products for suspension of concessions proposed by the USA can be found in Annex II of WTO (1999b).

Table 1. Calculation of the level of nullification and impairment (damage) in the USA–EC hormones case.

High quality beef (HQB)								
"Hypothetical exports"					"Current exports"			Total US$
[(11,500 tonnes	*1)	*0.92	*5,342]	–	(31,804,779	*0.75)		**32,664,776**
Tariff quota	TRQ 100% filled	US share (18% Canada)	Price: US$/t (f.o.b.)		US$ (f.o.b.)	25% reduction for "test & hold"		"Hypothetical minus current exports"
Edible beef offal (EBO)								
"Hypothetical exports"					"Current exports"			Total US$
[(65,568 tonnes	*	0.816	*1,689)	–	(2,460,759	*0.75)]	*0.95	**84,095,731**
av. 86–88 exports 18.4% adjustment for decline in consumption but for the ban			Price: US$/t (f.o.b.)		US$ (f.o.b.)	25% reduction for "test & hold"	5% red. for pet food usage	"Hypothetical minus current exports"
Total damage (US$): HQB + EBO								**116,760,507**

Source: WTO (1999b), Annex I. TRQ = in-quota tariff rate (20%).

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 based on exports at the f.o.b. stage (excluding insurance and freight) and also on f.o.b. prices (see Table 1).

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. It was expected that the tariff quota would be 100 per cent filled. 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 (damage) for the USA of US$116.8 million per year (see Table 1). However, only slight changes in the assumed parameters (US share, price, reduction factor etc.) could change the results.

The 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. 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 measures are set in this case in the same sector as the noncompliance has taken place, namely in the agricultural sector. The list of agricultural products for suspension of concessions proposed by the USA is given in Annex II (WTO, 1999b).

Since July 1999, the USA have taken countervailing measures worth US$584 million (US$116.8 million over five 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.

3.1.3. The economic impact of the hormones mini trade war

The welfare and trade implications of this and the following ''mini trade wars'' between the EU and the USA are analyzed with the help of model simulations with the computable general equilibrium model GTAP5 (see Box: GTAP5).

Box: GTAP5 Model

The model we use for the analysis of the four EU–US mini trade wars is the ''Global Trade Analysis Project'' (GTAP5) computable general equilibrium (CGE) world model. The standard model version used here is a multiregion, multisector, computable general equilibrium model, (http://www.gtap.agecon.purdue.edu/products/_images/model.gif) with perfect competition and constant returns to scale. Bilateral trade is handled via the Armington assumption. The major asset of the GTAP5 model is the consistent world data base of the year 1997. GTAP5 comes with data for 66 world regions, 57 commodities and 5 factors of productions. For our purpose we have aggregated the model to 12 regions, 7 sectors and 5 factors of production.

Aggregation level 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

The model is documented in the GTAP book by Hertel (1997). A description of the GTAP5 data base can be found in Dimaranan and McDougall (2002). The Global Trade Analysis Project (GTAP) was established in 1992 at the Purdue University, with the objective of providing a publicly available, global data base, a standard general equilibrium modeling framework, a global network of more than 12000 researchers with the interest of multi-region trade analysis and related issues and a World Wide Web site: http://www.gtap.agecon.purdue.edu

Although a CGE model is the adequate instrument to analyse trade policy issues it has limitations. This is the case in the banana dispute and more so in the case of retaliation, taking into account the very detailed products affected. In order to get some idea of the complex economic implications of breaching WTO regulations and the following retaliation one has to make compromises or rely on partial equilibrium analysis. In our case we tried to map the 57 sectors of the GTAP5 model to 7 new sectors which are relevant in the analysis of the four mini trade wars. As data for trade and wholesale in Bananas are not explicitly provided in the GTAP5 database we approximated this sector with ''vegetables, fruit, and nuts.''

Before starting with the evaluation of the economic impact of the EU–US trade dispute one must clarify what is meant by the decisions of the WTO arbitrators. In the hormones case the statement was not quite clear. ''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, 1999b, p. 17). As a rule such a decision by the arbitrators under DSU is interpreted as the authorization for the complaining party to impose countermeasures up to the level of nullification or impairment in the form of additional 100% ad valorem duties.[13] The retaliatory tariff is meant to be and is usually prohibitive. That means that

13 For this explicit interpretation, see the FSC case (Council Regulation (EC) No 2193/2003 of 8 December 2003).

the imports of the targeted products of the retaliation list come to a halt completely or that they decline considerably (depending on the price elasticity of demand). In the first case no tariff revenue can be collected in the second case only a limited amount.

Two scenarios are simulated with the GTAP5 model:

(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) is so calibrated 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. The USA reduces its imports from the EU by US$116.8 million distributed on several sectors. As the retaliation list of products (see Annex II in WTO, 1999b) is very detailed we implemented these retaliations in the sectors ''meat,'' ''food,'' ''other primary products'' and ''manufacturing.''

(III) In the *third scenario* we simulate the economic impact of the combined implementation of measures and counter-measures of the scenarios (I) and (II). This situation we call ''mini trade war.''

The results confirm Anderson's (2002) theoretical statement that 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. Mavroidis, 2001, p. 46 for such a phrase).

The *results* of our model simulations can be summarized as follows (see Table 2):

(a) All the effects are small due to the low amount of impairment involved relative to total trade between both partners.

(b) Nevertheless, the ban on hormone treated US beef seems to have the effect of ''shooting the EU themselves in the foot.'' Scenario (I) leads to welfare losses (measured by the total welfare measure of GTAP5, covering allocation and terms of trade effects) in the EU and in the USA. However, they are twice as high in the EU. 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.

(c) The retaliation by the USA (scenario II) leads to welfare losses for the EU, whereas in 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

Table 2. The hormones case: results of model simulations.

	Welfare total* (as % of GDP)		Welfare allocation (as % of GDP)		Terms of trade (%-change)	
Scenarios	EU	USA	EU	USA	EU	USA
(I)	−0.000539	−0.000264	−0.000750	−0.000001	0.000676	−0.002122
(II)	−0.000334	0.000129	0.000003	−0.000028	−0.001097	0.001288
(III)	−0.000873	−0.000135	−0.000747	−0.000029	−0.000420	−0.000830
	Exports with Partner (%-change)		GDP, nominal (%-change)		GDP, real (%-change)	
(I)	−0.008001	−0.028448	0.001249	−0.001964	−0.000750	−0.000001
(II)	−0.061330	−0.012093	−0.002345	0.001747	0.000003	−0.000028
(III)	−0.069338	−0.040547	−0.001100	−0.000322	−0.000747	−0.000029

* Total welfare = allocation plus terms of trade plus other effects.
Hormones case:
(I) = EU bans MEAT imports from the USA amounting to US$116.8 million (input in the meat sector).
(II) = USA reduces imports from EU by US$116.8 million according to retaliation list of products (inputs in the sectors: meat, foot, other primary and manufactures).
(III) = EU versus USA trade war: Scenarios (I) + (II) combined.
Source: Own simulations with the GTAP5 model.

volume declines. Real GDP decreases, nominal GDP increases slightly in the US due to additional tariff revenues.

(d) The ''mini trade war'' between the USA and the EU is given when both scenarios (I) and (II) are simulated together—which in reality takes place in this trade dispute. Quantitatively, the results are the sum of the effects of both scenarios. Welfare decreases more than in the USA (due to terms of trade improvements).[14] Trade between each other declines, so does real GDP. In both cases the negative effects are stronger in the EU than in the USA.

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 quintupled already. A new EU Directive (2003/74/EC) concerning the prohibition on the use of hormones has entered into force on October 14, 2003. As a consequence the European Commission

14 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).

requested the USA and Canada to lift their trade sanctions on October 15, 2003. The EU member states must implement the directive within 12 months of its entry into force. Since that request there was no reaction by the US or Canada to dismantle their trade sanctions in the hormones case.

3.1.4. Unintended consequences of trade conflicts

Non-compliance and retaliation leading to ''mini trade wars'' can have several unintended side effects. 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 may, however, also influence third countries via trade diversion. This ''externalities'' of WTO-allowed retaliation was not considered from the designers of the WTO dispute settlement system. In scenario (III) the third country effects are positive as in all other 10 regions the overall welfare measure is positive. Only in the case of the welfare measure due to misallocation the EFTA and Turkey would lose somewhat.

Furthermore, besides the problem of calculating the level of damage a country suffers from another not complying with WTO rules the question of controlling was overlooked by the DS architects. Once the amount of impairment is set by the Arbitrators in the WTO DS procedure, who controls ever whether the country (in our case the USA) which has the allowance to retaliate really only reduced imports by the amount authorized by the WTO?

Additionally the WTO arbitrators only calculate a nominal static damage without considering reactions of economic agents when tariffs are re-imposed! Further, who guarantees that the country collecting the retaliatory revenues (although they might be negligible due to the prohibitive character of the retaliatory measures) distributes them to the companies who suffered the loss? These observations are true also for all following cases. So, not only the instruments of tariffs are inefficient, in so far as they have several externalities (terms-of-trade effects and other misallocation), it punishes companies which have nothing to do with the trade policies imposed by the government (in case of the EU by the Commission). Furthermore, one must conclude from the theoretical analysis (see Grossman and Helpman, 1995; Breuss, 2003) that only large and powerful countries can win trade wars (tariff wars seem designed for large countries!). That implies that small and poor countries (LDCs) are disadvantaged not only from the access of the DS process (''biased'') but also from the bad outlook ever to win a tariff war against a large country.

3.2. The bananas case

3.2.1. The rise and fall of a long-lasting conflict

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.[15] Only after nearly a decade, the Banana dispute had been resolved. With the Council Regulation (EC) No 2587/2001 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); Vranes, 2003a, p. 33).[16]

The Bananas dispute with the EU started in 1996. 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).

3.2.2. Peculiar retaliation practices

The USA requested suspension of concessions (US$520 million per year), the EC requested arbitration on this amount. In April 19, 1999 the DSB authorized the USA to

15 For a comprehensive documentation and analysis of the Bananas Dispute, see Breuss et al. (2003).

16 Some authors (e.g. Borrell and Bauer, 2004; Guyomard and Le Mouel, 2002) think that the EU–US banana dispute was not resolved by this agreement. In contrast, Borrell and Bauer (2004) see a new EU banana drama looming after the implementation of the new EU banana regime. They fear that the ''tariff-only'' system could be even more distorting and discriminatory than the EU banana regime of 1993. Even at a current rate of € 75 a tonne the EU would discriminate Latin American banana producers, in favour of ACP producers, primarily the African banana exporters. Multinational banana companies (e.g. US companies) are already expanding production in Africa. A comprehensive assessment of the impact on the Caribbean of the reform—or tariffication—of the EU Common Organisation of the Market in Bananas (COMB) in 2006 can be found in DFID (2004).

suspend concessions worth US$191.4 million per year (WTO, 1999a). 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.[17] 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 USA 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).[18] 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.

3.2.3. Problems 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

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

18 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).

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.

Nevertheless, 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).[19]
(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

19 These indirect damages were, however, not accounted for in the calculations of the level of compensation by the Arbitrators of the WTO in the EU–USA Bananas case.

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 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 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*. In contrast to the Hormones case, the way in which the Arbitrators dealt with these calculations is highly intransparent.

Since March 1999, the USA has taken countervailing measures worth US$478.5 million (US$191.4 over 2 1/2 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%).

3.2.4. The economic impact of the bananas 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. Before doing this one must, however, confess that it is nearly impossible with a CGE model with relatively broadly defined sectors to capture the effects of single products.[20] The Banana dispute as described earlier, is a very complex case, involving goods trade and services, tariffs and quotas and a whole bunch of countries. In addition to the USA and the Latin American producers also the 78 ACP countries and the EU are involved in the Banana case. To make the story even more complex, within the EU there are at least four groups with different trade regimes before the EU implemented its common organization of the market in bananas in 1993: a) free trade countries (Austria, Finland, Germany, and Sweden); b) Tariff imposing countries (Belgium, the Netherlands, Luxembourg, Denmark and Ireland); c) ACP supplied countries (Italy and the United Kingdom); d) Countries with own production (France, Greece, Spain and Portugal). In each of these groups the welfare implications of the EU banana regime of 1993 were different (see Badinger et al., 2002, 2003).

The following CGE simulations are therefore a rough approximation of the subtleties of the Banana case. On the one hand, we take the EU only as a group and on the other hand, we just analyse the bilateral trade problems between the EU (as a group) and the USA. Furthermore, we only look at the welfare and trade implications caused by the reduction of EU banana imports from the USA and the following retaliation by the USA. We neglect the effects of other countries involved (Ecuador, Guatemala, Honduras, Mexico and the third parties Saint Lucia, Dominican Republic, Nicaragua and Jamaica, and also the ACP countries).[21]

We consider two scenarios:

(I) In the *first scenario*, the EU has in place its import regime for bananas which is discriminating according to WTO. The damage is worth US$191.4 million per year. The EU Banana regime is implemented in the GTAP5 model by assuming that in the ''banana sector''[22] the EU imports from the USA are reduced by the amount of damage calculated by the WTO arbitrators (US$191.4 million per year).

(II) In the *second scenario*, the USA imposes trade sanctions according to the WTO DSB decisions worth the same amount. As in the Hormones case we have the same

20 A comprehensive description of the world banana market over the period 1985–2002 can be found in Arias et al. (2003).

21 Borrell (1999) doubts whether the EU Banana trade regime of 1993 had a significant positive effect for the ACP countries. Only a tine share of less than 10% of the huge costs this regulation imposed on European consumers actually reached its target in the ACP countries. Hence, the declared goal of the EU to support the ACP countries (''trade as aid'') seemed to be hardly reached by EU's banana policy.

22 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! As mentioned earlier, in the GTAP5 database banana are not explicitly available. Therefore we approximated the ''banana sector'' as the sector of ''vegetables, fruit, and nuts.''

ambiguity in the WTO arbitrators decision concerning the retaliatory sanctions.[23] But again we interpret it as the authorization for the USA to impose countermeasures in the form of additional 100% ad valorem tariffs on certain products originating from the EU. 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.

(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 (II).

The *results* of our model simulations can be summarized as follows (see Table 3):

(a) Again, due to the small dimension of the levels of trade restrictions and/or amount of impairment, the effects are small.
(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 declines. In a partial-equilibrium analysis of EC's banana regime, Badinger et al. (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 0.0011% of GDP. Behind this overall welfare loss, the EU member states performed differently. Countries with formerly free trade regimes for bananas (Austria, Finland, Germany and Sweden) are welfare losers by 0.0131% of GDP. Also the group of tariff imposing countries (Belgium-Luxembourg, the Netherlands, Denmark and Ireland) is a welfare loser (−0.0149% of GDP). From the countries which are supplied by ACP countries, Italy (0.0025% of GDP) is a winner and United Kingdom (−0.0001% of GDP) is a loser. Counties with own bananas production are partly winners (France and Greece) and partly losers (Portugal and Spain). Overall their welfare gain was 0.0161% of GDP.[24]
(c) The retaliation by the USA (scenario II) 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.

23 ''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).

24 Messerlin (2001) reaches similar conclusions as to the negative welfare implications for the EU.

Table 3. The bananas case: results of model simulations.

	Welfare total* (as % of GDP)		Welfare allocation (as % of GDP)		Terms of trade (%-change)	
Scenarios	EU	USA	EU	USA	EU	USA
(I)	0.000201	−0.000756	−0.000139	−0.000171	0.001079	−0.004780
(II)	−0.000671	0.000177	−0.000143	−0.000024	−0.001732	0.001558
(III)	−0.000470	−0.000579	−0.000281	−0.000196	−0.000653	−0.003221
	Exports with partner (%-change)		GDP, nominal (%-change)		GDP, real (%-change)	
(I)	−0.013515	−0.065884	0.003328	−0.004246	−0.000139	−0.000171
(II)	−0.105096	−0.018708	−0.003803	0.002279	−0.000143	−0.000024
(III)	−0.118611	−0.084593	−0.000476	−0.001967	−0.000281	−0.000196

* Total welfare = allocation plus terms of trade plus other effects.
Bananas case:
(I) = EU blocks BANANAS imports from the USA amounting to US$191.4 million (input in the ''bananas'' sector).
(II) = USA reduces imports from EU by US$191.4 million according to retaliation list of products (input in the manufacturing sector).
(III) = EU versus USA trade war: Scenarios (I) + (II) combined.
Source: Own simulations with the GTAP5 model.

(d) The ''mini trade war'' between the USA and the EU has led to welfare losses in both regions of nearly equal size in both countries. Bilateral trade was hampered quite a lot. Real GDP declines in both regions.

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

3.2.5. Why did the EU give in?

The same caveats as observed in the Hormones case are applicable in the Bananas case. Besides the ex post controlling problem concerning the level of reducing the ''right'' (equal) amount of imports which have been granted to retaliate 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) were in preparation in which the EU wanted 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.

3.3. The foreign sales corporations case

3.3.1. The biggest conflict nearly solved

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 Agreement on Subsidies and Countervailing Measures (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 was 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 Panel decision of August 20, 2001 (WTO, 2001b) confirmed the EU position that also the revised US FSC regulation (''FSC Repeal and Extraterritorial Income Exclusion Act of 2000''—ETI), set into force on November 15, 2000, was still not consistent with the SCM Agreement and the Agreement of Agriculture. Additionally, the legislation maintained in place the FSC regime at least until the year 2002.

On August 30, 2002 the WTO arbitrators estimated the damage of nullification for the EU amounting to US$4,043 million (WTO, 2002a). 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, 2002a, p. 39–40).[25] Therefore the award of the Arbitrator was to determine that ''... the suspension by the European Communities of concessions under the GATT, 1994 in the form of the imposition of a 100 per cent ad valorem charge on imports of certain goods from the United States in a maximum amount to $4,043 million per year ... constitute appropriate countermeasures within the meaning of Article 4.10 of the SCM Agreement.'' (WTO, 2002a, pp. 33).

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

3.3.2. Gradual EU retaliation

As of May 7, 2003 the WTO—based on its decision of 30 August 2002 (WTO, 2002a)—authorized the EU to apply countermeasures of up to US$4 billion 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$4,043 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, 2003b). On 8 December 2003, in response to continuing non-compliance by the US with WTO dispute settlement rulings on the incompatibility with WTO rules on its FSC act and replacement regulation the EU Council ''General Affairs'' adopted a Regulation[26] establishing customs duties on

25 Although the United States encouraged the arbitrator to refrain from economic modelling because of the range of uncertainties as to the correct values of the elasticity of substitution parameters (WTO, 2002a,b, p. 6) the arbitrator in the FSC case-for the first time-relied on economic modelling in determining the trade effect. That meant it collected a variety of data on parameters on the elasticity of substitution from US and EC models to calculate the value of the subsidy and hence the level of damage for the year 2000.

26 Council Regulation (EC), No 2193/2003 of 8 December 2003 with a detailed list of products, identified by their eight-digit CN codes, to be targeted by the EU retaliatory measures. General information about market access conditions in non-EU countries can be found in EUs Market Access Database: http://mkaccdb.eu.int.

imports of certain products from the United States. As the EU's objective was not the punitive duties on US products but the creation of an incentive for US to withdraw the illegal exports subsidy, limited countermeasures were applied only as from 1 March 2004. The application of duties started at an initial level of 5% and will be increased monthly up to a level of 17% in March 2005. Further actions will depend on the US development in this matter. The EU is encouraged by recent action in Congress towards the repeal of the FSC/ETI legislation. On 11 May 2004 the US Senate adopted the JOBS Act, a bill which repeals the FSC/ETI. On 17 June 2004 the US House of Representatives adopted the Thomas bill repleasing the FSC/ETI. If both the House and Senate can agree on a final text so that an FSC/ETI repeal bill is adopted and signed into law by the president, the FSC induced EU–US trade dispute can be settled. As a compensation of the WTO incompatible export subsidies the effective corporation tax rates may be reduced from 35% to 32%.[27]

3.3.3. Which economic impact can be expected from the FSC mini trade war?

As the EU started only gradually to implement the countermeasures in 2004, the calculation of the welfare and trade implications of this transatlantic ''mini trade war'' amounting to a maximum retaliation level of US$4 billion is hypothetical. The FSC case is quantitatively by far the most important case for both sides. Utilizing the whole US$4 billion would amount to 2 1/2% of EU's import from the US. To evaluate the economic impact we simulate two 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. Here, the WTO decision is interpreted straightforwardly by the EU as the authorization to impose 100% ad valorem duties on import goods from the USA.[28] 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, other primary goods, steel and manufactures.

27 In its Fact sheet published by the European Union on the occasion of the EU-US Summit, Dromoland Castle, Ireland, 26 June 2004 it mentions as an example of benefits from the FSC legislation the tax scheme by Boeing. Boeing declared in its 2003 financial statements that FSC tax benefits amounted to US$115 million or 16% of the companys net earnings of 2003. Between 1995 and 2003 FSC benefits for Boeing amounted to US$1–2 billion.

28 The Council Regulation (EC) No 2193/2003 of 8 December 2003 in its comment (under point 2), makes it clear that the ''Community was authorized by the DSB to impose countermeasures up to a level of US$4,043 million in the form of additional 100% ad valorem duties on certain products originating in the United States of America.'' In the appendix to this Council Regulation one can find the list of products chosen for retaliation.

Table 4. The FSC case: results of model simulations.

	Welfare total* (as % of GDP)		Welfare allocation (as % of GDP)		Terms of trade (%-change)	
Scenarios	EU	USA	EU	USA	EU	USA
(I)	0.010163	−0.002143	0.002144	0.000686	0.028071	−0.035651
(II)	0.007094	−0.015304	−0.001326	−0.000983	0.026789	−0.115756
(III)	0.017251	−0.017441	0.000816	−0.000296	0.054861	−0.151408
	Exports with partner (%-change)		GDP, nominal (%-change)		GDP, real (%-change)	
(I)	0.239033	1.739642	−0.031311	0.053677	0.002144	0.000687
(II)	−0.390677	−1.888334	0.075005	−0.102136	−0.001327	−0.000982
(III)	−0.151643	−0.148694	0.043694	−0.048459	0.000817	−0.000295

* Total welfare = allocation plus terms of trade plus other effects.
FSC case:
(I) = USA subsidizes exports to EU by US$4,043 billion (input in all 7 sectors).
(II) = EU reduces imports from USA by US$4 billion according to retaliation list of products (inputs in the sectors: meat, food, other primaries, steel and manufactures).
(III) = EU versus USA trade war: Scenarios (I) + (II) combined.
Source: Own simulations with the GTAP5 model.

(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 (II) simultaneously into the model.

As mentioned above, in reality the FSC regulation of the US aims not only at stimulating 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.

The *results* can be summarized as follows (see Table 4):[29]

(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 2.4% of EU's imports from the USA. In scenario (I), the isolated effects of the WTO-illegal FSC scheme is simulated. Export subsidies have the classical text book effects.[30] Welfare and terms of trade decrease in the export subsidizing country. The

29 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 12×7×5 CGE world model of GTAP5. In the previous calculations we used a 3 regions, 7 sectors model with 2 factors of production (see Breuss, 2003, p. 166).

30 Bagwell and Staiger (2004b) present a first formal analysis of the international rules that govern the use of subsidies to domestic production (as distinct from export subsidies).

EU gains in welfare, mainly due to the relatively strong improvement of the terms of trade. US exports to the EU increase by 1.72%. Also EU exports to the US increase slightly. Overall, there is a slight increase in real GDP.

(b) In scenario (II) overall welfare in the EU increases, mainly due to the terms of trade gains. The introduction of retaliatory tariffs, however, deteriorates welfare due to allocation in the EU. The USA loses welfare. The trade restrictions would result in a decline in bilateral exports, whereby the US exports to the EU would shrink strongly (by 1.88%). 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 by nearly the same amount (0.15%) in both countries. There would be a Trade Creation effect in the EU because intra-EU trade would be stimulated by 0.04%.

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 eight regions would slightly improve total welfare in case of scenario (III); the ROW would lose somewhat. In addition to the ROW, three regions/countries (Canada, Mexico and EFTA) would have slight negative allocation effects. In 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).

3.3.4. Considerable implications of the FSC trade conflict

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 the other hand, contrary to the first two cases the FSC induced trade war between the EU and the USA—if it will not be solved—would be of a considerable dimension and it would involve nearly all sectors of both economies with consequences on welfare, allocation, efficiency, labor markets and change in sectoral competitiveness in both countries, which are not easily predictible. 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. In this case, it can be argued to the extreme, that the present method of sanctions allowed by the WTO-DS system is irresponsible. The WTO DSB simply does not know the economic consequences of its retaliatory practice in all details. However, the WTO dispute settlement system does not work on its own interest, but on behalf of the complainant and

defendant parties. This calls for a reform of the present system which works only with retaliatory tariffs.

3.4. The steel case

3.4.1. Politically motivated protection

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.[31] 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).[32] 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

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

32 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.

products. The EU adopted definitive safeguard measures on seven steel products.[33] 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 fought the US steel protectionism was 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 Stefn Jóhannesson, Mr. Mohan Kumar and Ms Margaret Liang as panelists. The Final Reports of the Panel were issued on July 11, 2003 concluding that the safeguard measures by the US government are not compatible the WTO Safeguard Agreement (WTO, 2003c).

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 claimed 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

33 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.

related measures. At that time no estimation of the damage the EU and the USA might have suffered from the counter-safeguard actions in the steel sector were available. However, on 23 August 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 exempted 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 substantial 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 would amount only to roughly US$1 billion.

The Appellate Body of the WTO, on November 10, 2003, issued its report on the complaints brought to the WTO by Brazil, China, the European Communities, Japan, Korea, New Zealand, Norway and Switzerland against United States—''Definitive Safeguard Measures on Imports of Certain Steel Products.'' It upheld most of the Panel's conclusions that the US measures were inconsistent with the WTO Safeguard Agreement and the GATT, 1994 but reversed some findings regarding tin mill products and stainless steel wire which did not affect the overall result (WTO, 2003d).

3.4.2. Political pressure answered with counter pressure

Without authorization of a concrete amount of countervailing measures by the WTO, the European Union's threat of retaliation led President Bush to the decision to terminate US steel safeguard measures on December 4, 2003. The Tariffs were dismantled, 16 months earlier than originally planned. The European Union's threat of retaliation added to the pressure. It was poised to impose tariffs on trade worth up to US$2.3 billion (or €2.4 billion), targeting exports from states that will be vital to Mr. Bush's re-election campaign, such as Florida and Wisconsin. The scale of the threat was daunting—ten and 20 times greater, respectively, than the retaliation provoked by disputes over bananas and beef hormones. In the 20 months since the tariffs were imposed, the US steel industry has consolidated (according to The Economist, 5th December 2003). The steel case is a classical example of the ''endogenous tariff theory'' (see Mayer, 1984; and Grossman and Helpman, 1995). The electorate around Pittsburgh, a big steel town lobbied for the introduction of protective measures for their uncompetitive industries to secure jobs. The counter lobby, the steel-using industries cried for the lift of the safeguard steel measures. They argue that they have lost as many as 26.000 jobs because of the tariffs (The Economist, 5th December, 2003, based on a study by the Institute for International Economics, IIE).

As a consequence of the dismantling of US steel safeguard measures, on December 12, 2003 the EU Council adopted a Regulation repealing EU countermeasures established by Regulation 1031/2002 of December 6, 2003. This Regulation provided for the application of additional customs duties (retaliatory measures) on imports from the US of a variety of products from March 20, 2005. It cited considerable injury to EU producers, significantly limiting EU exports of steel products to the US and affecting EU exports worth at least 2,407 million euros per year.

3.4.3. The hypothetical economic impact of the steel mini trade war

The transatlantic Steel dispute ended before the WTO arbitrators could determine the level of damage the EU economy might have suffered due to the US safeguard measures and how big the damage might have been in the United States caused by the EU counter measures over the 20 month period of this dispute. Because no official WTO estimations exist as to the possible damage we make some hypothetical assumptions in our model simulations in two steps:

(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 countries/regions (EU, EFTA, Turkey, Brazil, China, Japan and Korea; LDCs, and the NAFTA countries Canada and Mexico were exempted from the safeguard measures) resulting in additional import tariff revenues in the USA by around US$391 million. As the EU Commission already estimated the potential damage in the EU to amount to around US$1 billion less steel exports to the US market, we calibrate the US safeguard measures in order to target a US$1 billion steel import reduction from the EU (which amounts to 0.4% of US imports 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[34] in the GTAP5 model simulations. An indication that the trade diversion effect must not have been large is the reduction of the number of products for which the EU introduced counter safeguard measures from originally 21 to only 7 steel products. If one accepts the procedure of implementing the steel case one can look at the welfare implications (see Table 5). 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 gain terms of trade but suffer allocation losses, resulting in an overall welfare gain. Both countries suffer a slight real GDP loss. Bilateral trade declined, more so the exports of the EU to the US than the other way round.

(II) In the *second scenario* we simulate the introduction fictional retaliatory measures by the EU amounting to an assumed US$1 billion. As mentioned earlier, the European Union's threat of retaliation was much higher (US$2.3 billion). In our model simulations the sectors food and manufactures are targeted primarily.
It turns out that the overall welfare of the EU would have increased (those of the US decreased) due to the terms of trade improvements resulting from the retaliating. However, there are negative allocation effects in both countries. Bilateral trade between the EU and the USA would decline, stronger in the USA than in the EU. Real GDP would slightly decrease in both countries (see Table 5).

(III) In the ''*mini trade war*'' *scenario* we combine the scenarios (I) and (II). This results in welfare losses on both sides of the Atlantic (''shooting in their own feet'').

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

Table 5. The steel case: results of model simulations.

	Welfare total* (as % of GDP)		Welfare allocation (as % of GDP)		Terms of trade (%-change)	
Scenarios	EU	USA	EU	USA	EU	USA
(I)	−0.003174	0.001096	−0.000614	−0.000412	−0.008291	0.013025
(II)	0.002142	−0.004161	−0.000181	−0.000278	0.007402	−0.031401
(III)	−0.001030	−0.003065	−0.000795	−0.000690	−0.000889	−0.018376
	Exports with partner (%-change)		GDP, nominal (%-change)		GDP, real (%-change)	
(I)	−0.467466	−0.110962	−0.016206	0.013390	−0.000614	−0.000412
(II)	−0.106857	−0.511811	0.020733	−0.027991	−0.000181	−0.000278
(III)	−0.574330	−0.622773	0.004527	−0.014602	−0.000795	−0.000690

* Total welfare = allocation plus terms of trade plus other effects.
Steel case:
(I) = USA introduces safeguard measures for steel imports from the rest of the world (tariffs increase to 30%; inputs in the steel sector in seven regions: EU, EFTA, Turkey, Brazil, China, Japan and Korea); USA reduces steel imports from EU by US$1 billion.
(II) = EU reduces imports from USA by around US$1 billion (inputs in the sectors: food and manufactures).
(III) = EU versus USA trade war: Scenarios (I) + (II) combined.
Source: Own simulations with the GTAP5 model.

> Welfare due to allocation as well as terms of trade deteriorates in both countries. Bilateral trade would have declined by 0.6%. Real GDP is down in both countries. The simulation of the hypothetical steel ''mini trade war'' between the EU und the USA leads to an overall trade diversion. The exports of all countries/regions not exempted from the US steel measures EU will be redirected from the US to the EU. Besides the EU and the USA, China, Japan and Korea would have experienced welfare losses.

If the steel dispute would not have been settled by December 2003 and EU's threat of retaliation amounting to €2.4 billion would have been enacted by the year 2005 this trade dispute would have escalated—after the FSC case—to the second biggest EU–US ''mini trade war.''

3.5. Major findings of the analysis of four EU–US trade conflicts

Our economic evaluation of four EU–US ''mini trade wars'' has revealed the following findings and peculiarities:

(1) *The level of damage, calculated by the WTO versus the real economic impact*: The four cases studied 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 Hormones 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 and we calculated via model simulations in this paper, ''trade loss equivalence would never translate into equivalent damage to economic welfare, except by coincidence.'' The 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 either reduce imports of the targeted products either completely (100% extra tariffs act prohibitive) or not fully.[35] In short, the damage calculated by WTO arbitrators may finally be quite different from the overall economic impact of the introduction of retaliatory measures, in the economy of the complainant, in those of the defendant and also in third countries. In other respects too 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 caused 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.

(2) *Questionable system of compensation*: The present sanctions practice of the WTO Dispute Settlement Body 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. That means that small (and more so, poor less developed countries (LDCs) are discriminated in two respects. On the one hand, due to a lack of legal resources they 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

35 In the most recent decision by the Arbitrators in the ''Byrd Amendment'' case (WTO, 2004b), for the first time they tried to overcome this bias. Instead of determining a one and for all ''static'' value of damage they developed a formula which allows to adjust the level of damage (and hence the level of retaliation) to the yearly development of the CDSOA disbursement of the US government.

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 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 be 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).

(3) *Unpleasant implications of tariff retaliation*: 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.[36] 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. As long as such model devices are not at hand, the WTO DSB decisions on retaliatory tariffs—although not carrying out them on their own but on behalf of the WTO member states—are irresponsible. First promising attempts to correct such omissions can be found in the decisions of the Arbitrators in the FSC and the Byrd Amendment (CDSOA) cases. In the CDSOA case in particular, the Arbitrators have undertaken considerable effort to figure out the substitution elasticities (between domestic and import demand) and pass through coefficients from various partial and general equilibrium models available in order to determine the trade effect of the CDSOA disbursements and hence the level of damage for the complaining parties.[37] On the one hand they may discriminate

36 As Bronckers (2001, p. 62) mentions, various European companies, struck by US retaliatory measures, were considering filing damage claims against the European institutions pursuant to Article 288 EC Treaty.

37 The Arbitrators of the CDSOA case (WTO, 2004a,b, p. 24) make interesting statements as to the new modelling approach they have applied. ''We recognize that, in relying on an economic model in this arbitration, we may be breaking new grounds''. ''However, we note that economic modelling has already been applied in the US—FSC (Article 22.6—US) arbitration. We are also mindful that applying economic models in arbitration under Article 22.6 of the DSU may make such proceedings more complex and costlier. We acknowledge that economic analysis requires expertise that may not be readily available to all WTO Members.''

unintended small and poor WTO members. On the other hand the Arbitrators can not fully estimate the economic consequences of their decisions for the parties involved directly and more so for the countries not involved directly. Furthermore, even if one accepts the estimated level of trade sanctions, presently, there is no institution controlling whether the sanctioning country really implements retaliatory measures exactly to the amount authorized for retaliation and not more.[38] Additionally, who controls the distribution of the retaliatory tariff revenues—if there are collected any—to the companies suffering the damage?

Tariffs are therefore very bad instruments for countermeasures, on the one hand resulting in negative welfare effects for the retaliating country and on the other hand leading practically to no extra tariff revenues which could be used for compensation.

4. How to improve the WTO–DSU sanctions mechanism?

Based on the observations made in connection with the analysis of the four ''mini trade wars'' between the EU and the US, one can make the following suggestions for improving the retaliation system applied in the WTO Dispute Settlement procedure:

We have found that—from an economic point of view—tariffs are 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. A much more efficient and easier retaliation instrument than tariffs would be direct transfers 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.[39] 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 as a rule the reintroduction of tariffs as the major part of concessions

38 Some countries like Thailand and the Philippines (see WTO, 2003a, pp. 76–77) suggest a mechanism by which the defendant may ask for a panel in order to control the compliance of the retaliating country with the exact level of nullification he was authorized by the arbitrators.

39 This system would not be a new ''Byrd Amendment'' procedure. Under the WTO-incompatible Byrd legislation exporters are driven to finance their US competitors and hence, provide a direct financial reward from filing anti-dumping and anti-subsidy complaints. A total of US$231 million of collected anti-dumping and anti-subsidy duties was distributed in 2001 and around US$330 million in 2002. A third round of distribution started in 1 October 2003, amounting to US$240 million. The main recipients have been in the bail bearing, steel and other metal, household item and food (pasta) sectors.

in former GATT rounds consists of tariff reductions.[40] 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.[41]

There are other suggestions put forward to improve the retaliatory procedure. Anderson (2002) 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 control of procedures. With retaliation, by contrast, the complainant can keep pressure on the respondent until the latter complies. Anderson's suggestion, however, would confuse the ongoing general liberalization rounds under WTO.

Mexico,[42] realizing the prominent problem with the WTO dispute settlement procedure that small and developing countries have difficulties in finding the capacity to effectively retaliate against trading partners (e.g. if developing countries or LDCs do not find a trade sector or agreement in respect of which the suspension of concessions would bring about compliance without affecting its own interests) being in violation of their WTO commitments, proposed that retaliation rights be made tradeable (WTO, 2002b; see also Bagwell et al., 2004). Bagwell et al. (2003) offer a first formal analysis of the possibility that retaliation rights within the WTO system be allocated through auctions. The results, however, are highly sensitive to the auction format chosen.

40 In the pending case ''US Anti-Dumping Act of 1916'' the WTO arbitrators have—as a novelty—authorised the EU to impose sanctions consisting in an Anti-Dumping ''mirror legislation'' in the EU.

41 Bagwell and Staiger (2004a) analyze the importance of sovereign rights of nations in an interdependent world.

42 Mexico pointed also to another fundamental problem of the WTO DS system, namely the period of time during which a WTO-inconsistent measure can be in place without the slightest consequence. Illegal measures might be in place for more than three years (in the Bananas case for nearly a decade). This amounts to a ''de facto waiver'' in which a Member can maintain a WTO-inconsistent measure. To speed up this process, Mexico proposes a procedure of ''retroactivity'' by which the defending party can take preventive or provisional retaliation measures relatively early which are then clarified by the WTO arbitrators later (see WTO, 2002b, p. 1–5).

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

Sources: Data collection, based on Patrick A. Messerlin, WTO, Park (2004).

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

Sources: Data collection, based on Patrick A. Messerlin, WTO, Park (2004).

Table A.3. The EC–U.S. dispute settlement cases, 1995–2002.

Instrument targeted	U.S. as complainant	EC as complainant	Total
Tariffs	4		4
Import regime	3	3	6
Customs issues	3		3
Antidumping	2	4	6
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	3	1	4
U.S. laws	–	7	7
Total	30	22	52

Sources: Data collection, based on Patrick A. Messerlin, WTO, Park (2004).

References

Anderson, K., ''Peculiarities of retaliation in WTO dispute settlement,'' CEPR Discussion Paper Series, No. 3578, 2002.

Arias, P., Dankers, C., Liu, P., and Pilkauskas, P., ''The World Banana Economy.'' 1985–2002. Food and Agriculture Organization of the United Nations (FAO): Rome, 2003.

Badinger, H., Breuss, F., and Mahlberg, B., ''Welfare effects of the EU's organization of the market in bananas,'' Journal of Common Market Studies, vol. 40 no. 3, pp. 515–526, 2002.

Badinger, H., Breuss F., and Mahlberg, B., ''Welfare implications of the EU's common organization of the market in bananas for EU member states,'' in Breuss, F., St. Griller, and Vranes, E. (eds.), The Banana Dispute—An Economic and Legal Analysis. Springer: Wien–NewYork, pp. 357–417, 2003.

Bagwell, K. and Staiger, R.W., ''An economic theory of GATT,'' The American Economic Theory, vol. 89 no. 1, pp. 215–248, 1999.

Bagwell, K. and Staiger, R.W., ''Strategic trade, competitive industries and agricultural trade disputes,'' Economics and Politics, vol. 13 no. 2, pp. 113–128, 2001.

Bagwell, K. and Staiger, R.W., The Economics of the World Trading System. MIT Press: Cambridge and London, 2002.

Bagwell, K. and Staiger, R.W., ''National sovereignty in an interdependent world,'' NBER Working Papers, No. 10249, 2004a.

Bagwell, K. and Staiger, R.W., ''Subsidy agreements,'' NBER Working Papers, No. 10292, 2004b.

Bagwell, K., Mavroidis, P.C., and Staiger, R.W., ''The case for auctioning countermeasures in the WTO,'' NBER Working Papers, No. 9920, 2003.

Bagwell, K., Mavroidis, P.C., and Staiger, R.W. ''The case for tradable remedies in WTO dispute settlement,'' World Bank Policy Research Working Paper, No. 3314, 2004.

Besson, F. and Mehdi, R., Is the WTO Dispute Settlement System Biased Against Developing Countries? An Empirical Analysis, Paper presented at the 2nd International Conference on: ''European and International Political and Economic Affairs.'' Athens, 2004.

Borrell, B., Straightening Out Bent Ideas On Trade as Aid, Paper Prepared for the Conference on Agriculture and New Trade Agenda from a Development Perspective, Geneva, 1999.

Borrell, B. and Bauer, M., EU Banana drama: not over yet. New distortions from a high tariff-only policy. Centre for International Economics (CIE): Canberra and Sydney, Report, 2004.

Bown, C.P., ''The economics of trade disputes: the GATT's Article XXIII, and the WTO's dispute settlement understanding,'' Economics and Politics, vol. 14 no. 3, pp. 283–323, 2002.

Bown, C.P., ''Trade disputes and the implementation of protection under the GATT: an empirical assessment,'' Journal of International Economics, vol. 62 no. 2, pp. 263–294, 2004.

Breuss, F., ''WTO dispute settlement in practice—an economic assessment,'' in Breuss, F., St. Griller, and Vranes, E., (eds.), The Banana Dispute—An Economic and Legal Analysis. Springer: Wien–NewYork, pp. 131–184, 2003.

Breuss, F., Griller, S., and Vranes, E., (eds.), The Banana Dispute—An Economic and Legal Analysis. Springer: Wien–NewYork, 2003.

Bronckers, M.C.E.J. ''More power to the WTO?'' Journal of International Economic Law, pp. 41–65, 2001.

Busch, M.L, and Reinhardt, E., ''Developing countries and general agreement on tariffs and trade/World Trade Organization dispute settlement,'' Journal of World Trade, vol. 38 no. 4, pp. 719–735, 2003.

Bütler, M. and Hauser, M., ''The WTO dispute settlement system: a first assessment from an economic perspective,'' Journal of Law, Economic, & Organization, vol. 6 no. 2, pp. 503–533, 2000.

DFID, Addressing the Impact of Preference Erosion in Bananas on Caribbean Countries; A Report for DFID. UK Department for International Development (DFID): London, 2004.

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

European Commission, Report on United States Barriers to Trade and Investment. Brussels, 2003.

European Commission, General Overview of Active WTO Dispute Settlement Cases Involving the EC as Complainant or Defendant. Brussels, 2004.

GATT, ''The results of the Uruguay round of multilateral trade negotiations: the legal texts,'' Geneva, 1994.

Grossman, G.M. and Helpman, E., ''Trade wars and trade talks,'' Journal of Political Economy, vol. 103 no. 4, pp. 675–708, 1995.

Guyomard, H. and Le Mouel, C., ''The new banana import regime in the European union: a quantitative assessment,'' Institut National de la recherché Agronomique (INRA) and Unité d'Economie et Sociologie Rurales (ESR), Rennes, Working Paper 02–04, 2002.

Hertel, T.W., (ed.), Global Trade Analysis: Modeling and Applications. Cambridge University Press: New York, 1997.

Holmes, P., Rollo, J. and Young, A.R., ''Emerging trends in WTO dispute settlement,'' World Bank Policy Review Working Paper 3133, Washington, 2003.

Horn, H. and Mavroidis, P.C., ''Economic and legal aspects of the most favoured nation clause,'' CEPR Discussion Paper, No. 2859, London, 2001.

Horn, H., Mavroidis, P.C., and Nordström, H., ''Is the use of the WTO dispute settlement system biased?'' CEPR Discussion Paper, No. 2340, London, 1999.

Hungerford, T.L., ''GATT: A cooperative equilibrium in a noncooperative trading regime?'' Journal of International Economics, vol. 31, pp. 357–369, 1991.

Johnson, H.G., ''Optimum tariffs and retaliation,'' The Review of Economic Studies, vol. XXI (2) no. 55, 1953–1954, 142–153. Revised version in Harry and Johnson, G., (eds.), International Trade and Economic Growth: Studies in Pure Theory. George Allen & Unwin Ltd.: London, pp. 31–55, 1958.

Kennan, J. and Riezman, R., ''Do big countries win tariff wars?'' International Economic Review, vol. 29 no. 1, pp. 81–85, 1988.

Maggi, G., ''The role of multilateral institutions in international trade cooperation,'' The American Economic Review, vol. 89 no. 1, pp. 190–214, 1999.

Mavroidis, P.C., ''Remedies in the WTO legal system: between a rock and a hard place.'' in Matsushita, M., Mavroides, P.C. and Schonbaum, T.J., (eds.), The WTO Law and Practice. London, 2001.

Mayer, W., ''Endogenous tariff formation,'' The American Economic Review, vol. 74 no. 5, pp. 970–985, 1984.

McMillan, J., Game Theory in International Economics. Harwood Academic Publishers: Chur–London–Paris–New York, 1986.

Messerlin, P.A., Measuring the Costs of Protection in Europe: European Commercial Policy in the 2000s. Institute for International Economics: Washington, 2001.

Ortino, F. and Petersmann, E.-U., (eds.), The WTO Dispute Settlement System 1995–2003, Studies in Transnational Economic Law, vol. 18, Kluwer Law International: The Hague–London–New York, 2004.

Palmeter, D. and Mavroidis, P., Dispute Settlement in the World Trade Organization: Practice & Procedure. Cambridge University Press: Cambridge, U.K., 2004.

Park, N., ''Statistical analysis of the WTO dispute settlement system (1995–2000),'' in Ortino, F. and Petersmann, E.-U., (eds.), The WTO Dispute Settlement System 1995–2003, Studies in Transnational Economic Law, vol. 18, Kluwer Law International: The Hague–London–New York, pp. 531–553, 2004.

Petersmann, E.-U., ''Foreword: the WTO dispute settlement system 1995–2003,'' in Ortino, F. and Petersmann, E.-U., (eds.), The WTO Dispute Settlement System 1995–2003, Studies in Transnational Economic Law, vol. 18, The Hague–London–New York: Kluwer Law International, pp. xvii–xx.

Rodrik, D., ''Political economy of trade policy,'' in Grossman, G.M. and Rogoff, K., (eds.), Handbook of International Economics, vol. III, Elsevier: Amsterdam–Lausanne–New York–Oxford, Shannon–Tokyo, pp. 1457–1494, 1995.

Spagnolo, G., ''Issue linkage, credible delegation, and policy cooperation,'' CEPR Discussion Paper, No. 2778, London, 2001.

Staiger, R.W., ''International rules and institutions for trade policy,'' in Grossman, G.M. and Rogoff, K., (eds.), Handbook of International Economics, vol. III, Elsevier: Amsterdam–Lausanne–New York–Oxford, Shannon–Tokyo, pp. 1495–1551, 1995.

Vranes, E., ''Principles and emerging problems of WTO cross retaliation,'' Europäische Zeitschrift für Wirtschaftsrecht (EuZW), Heft 1, pp. 10–15, 2000.

Vranes, E., ''From Bananas I to the 2001 Bananas settlement: a factual and procedural analysis of the WTO

proceedings,'' in Breuss, F., St. Griller, and Vranes, E., (eds.), The Banana Dispute—An Economic and Legal Analysis. Springer: Wien–NewYork, pp. 11–37, 2003a.
Vranes, E., ''Cross retaliation under GATS and TRIPS—an optimal enforcement device for developing countries?'' in Breuss, F., St. Griller, and Vranes, E., (eds.), The Banana Dispute—An Economic and Legal Analysis. Springer: Wien–NewYork, pp. 113–130, 2003b.
Whalley, J., Trade Liberalization Among Major World Trading Areas. The MIT Press: Cambridge, Massachusetts, London, England, 1985.
Widsten, A.L., Trade Wars over Products and Principles: U.S. and EU Disputes over Agriculture, Paper Presented at the 2nd International Conference On: ''European and International Political & Economic Affairs.'' Athens, 2004.
WTO, ''European Communities—Regime for the Importation, Sale and Distribution of Bananas—Recourse to Arbitration by the European Communities under Article 22.6 of the DSU: Decision by the Arbitrators (USA case),'' World Trade Organization, WT/DS27/ARB, 1999a.
WTO, ''European Communities—Measures Concerning Meat and Meat Products (Hormones)—Recourse to Arbitration by the European Communities under Article 22.6 of the DSU: Decision by the Arbitrators (USA case),'' World Trade Organization, WT/DS26/ARB, 1999b.
WTO, ''European Communities—Measures Concerning Meat and Meat Products (Hormones)—Recourse to Arbitration by the European Communities under Article 22.6 of the DSU: Decision by the Arbitrators (Canada case),'' World Trade Organization, WT/DS48/ARB, 1999c.
WTO, ''European Communities—Regime for the Importation, Sale and Distribution of Bananas—Recourse to Arbitration by the European Communities under Article 22.6 of the DSU: Decision by the Arbitrators (Ecuador case),'' World Trade Organization, WT/DS27/ARB/ECU, 2000.
WTO, ''European Communities—Regime for the Importation, Sale and Distribution of Bananas—Notification of Mutually Agreed Solution,'' World Trade Organization, WT/DS27/58, 2001a.
WTO, ''United States—Tax Treatment for ''Foreign Sales Corporations,'' Recourse to Article 21.5 of the DSU by the European Commission,'' World Trade Organization, WT/DS108/RW, 2001b.
WTO, ''United States—Tax Treatment for ''Foreign Sales Corporations,'' Recourse to Arbitration by the United States under Article 22.6 of the DSU and Article 4.11 of the SCM Agreement: Decision of the Arbitrator.'' World Trade Organization, WT/DS108/ARB, 2002a.
WTO, ''Dispute Settlement Body—Special Session—Negotiations on Improvements and Clarifications of the Dispute Settlement Understanding—Proposals by Mexico.'' TN/DS/W/23, Geneva, 2002b.
WTO, ''Special Session of the Dispute Settlement Body: Compilation of Draft Text Proposals,'' JOB(3)10/Rev.3, Geneva, 2003a.
WTO, ''United States—Tax Treatment for ''Foreign Sales Corporations:'' Recourse by the European Communities to Article 4.10 of the SCM Agreement and Article 22.7 of the DSU,'' WT/DS108/26, 2003b.
WTO, ''United States—Definitive Safeguard Measures on Imports of Certain Steel Products,'' WT/DS248//R to WT/DS259/R, Final Reports of the Panel, 2003c.
WTO, ''United States—Definitive Safeguard Measures on Imports of Certain Steel Products,'' WT/DS248/AB/R to WT/DS259/AB/R, Report AB-2003-3 of the Appellate Body, 2003d.
WTO, ''Trade Policy Review United States,'' WT/TPR/S/126, 2003e.
WTO, A Handbook on the WTO Dispute Settlement System. WTO and Cambridge University Press: Geneva and Cambridge, U.K., 2004a.
WTO, ''United States—Continued Dumping and Subsidy Offset Act of 2000,'' (Original Complaint by the European Communities): Recourse to Arbitration by the United States und article 22.6 of the DSU: Decision by the Arbitrator, WT/DS217/ARB/EEC, 2004b.