

# WTO Dispute Settlement from an Economic Perspective – More Failure than Success?

Fritz Breuss

Research Institute for European Affairs  
Vienna University of Economics and Business Administration  
Althanstrasse 39-45  
A-1090 Vienna/Austria  
[Fritz.Breuss@wu-wien.ac.at](mailto:Fritz.Breuss@wu-wien.ac.at)

## Abstract

Since its inception in 1995, more than 200 disputes have been raised under the WTO Dispute Settlement Understanding (DSU). In spite of the obvious numerical success of the DS system of the WTO, in practice several shortcomings call for institutional and/or procedural change. This analysis deals with the economic aspects of the DS system. First, it turns out that the WTO DS system seems to be “biased”. The larger and richer trading nations (USA, EU) are the main users of this system, either because of the larger involvement in world trade, or because the LDCs simply lack the legal resources. Second, in taking advantage of recent theoretical explanations of the WTO system in general (trade talks) and the DS system in particular (aberrations from WTO compliance can lead to trade wars) one can theoretically derive the relative robust result concerning the present practice of the WTO DS system: retaliation with tariffs is ineffective, distorts allocation and is difficult to control. This is also demonstrated in an CGE model analysis for the most popular disputes between the EU and the USA: the Hormones, the Bananas and the FSC cases. The major conclusion of our economic evaluation is that the DS system of retaliation should be changed towards a transfer-like retaliation system.

**Keywords:** WTO Dispute Settlement, Trade Policy, CGE Model Simulations

**JEL-Classification:** F13, D58

## ***1. Introduction<sup>1</sup>***

One of the unique features of the WTO if one compares it to other international organizations, is dispute settlement. “Since its inception in 1995, about 200 disputes have been raised under the WTO Dispute Settlement Understanding (DSU). If they are not settled amicably, these disputes are litigated rapidly, and can go through two instances within eighteen months. If the losing government does not comply with a WTO ruling within a prescribed, short time period, it exposes its exports to retaliatory measures from the winning country” (Bronckers, 2001, p. 45). Currently, more than US\$ 300 million of EC exports are subject to extra tariffs of 100 percent imposed by the United States in retaliation against the tardy implementation by the EC of the WTO rulings in the Bananas and Hormones cases.

In spite of the obvious success of the DS system of the WTO, the practice so far either calls for institutional and/or procedural change. Some authors argue in favor of “more power to the WTO”. Bronckers (2001) for instance, believes that the WTO because of its unique characteristics (package deals; effective dispute resolution), has the potential to become a key pillar of global governance, with added duties for environmental, labor, investment, competition law issues. According to him, the WTO should not just be concerned with international trade but with all other economic and social issues. If the WTO ever could play this role, it deserved a better name, the World Economic Organization (WEO). Whether such suggestions are realistic in times of massive anti-globalization protests (remember Seattle, Prague, Göteborg and Genua) is more than questionable. The range of institutional issues that needs to be reviewed in the WTO is fairly well mapped out (see Bronckers, 2001, p. 46). There is a need for more internal and external transparency. Decision-making needs to be improved. Revision of dispute settlement procedures is overdue. As the WTO lacks the power to directly enforce agreements (WTO/GATT, GATS, TRIPS etc.; see, Maggi, 1999, p. 190)<sup>2</sup>, their indirect arm, the DS system must be strengthened. In addition, the position of developing countries in the WTO requires special attention. There is evidence that the LDCs have a disadvantageous or “biased” position in the DS system of the WTO (see Horn-Mavroidis-Nordström, 1999). On the one hand the larger trading nations have been the main users of the WTO DS system, either because of the proportional relationship between disputes and the diversity and value of exports, or because the LDCs simply lack the necessary legal resources. On the other hand, it is a simple question of economic power. The LDCs can only exercise much weaker pressure on the losing developed country than would be the case the

---

<sup>1</sup> I would like to thank Gerhard Fink, Stefan Griller and Erich Vranes for valuable comments.

other way around. Having a smaller market, and importing goods and services that may well be important to their development, retaliation is usually not an effective option for them. Even cross-retaliation in the area of intellectual property (TRIPS Agreement), is unlikely to offer them much relief, as is borne out by Ecuador's experience in the Bananas dispute (Bronckers, 2001, p. 61). After determining the level of Ecuador's nullification and impairment worth US\$ 201.6 million per year (WTO Decision by the Arbitrators; WTO, 2000, p. 36), even the Arbitrators stated at para 177 that "it could be that Ecuador may find itself in a situation where it is not realistic or possible for it to implement the suspension authorized by the DSB for the full amount of the level of nullification and impairment". In fact, Ecuador suspended its right for retaliation against the EC.

This contribution deals with the economic aspects of the DS system of WTO, in particular demonstrated for the Hormones, the Bananas and the FSC cases between the EC and the USA. After a short introduction and an evaluation of the WTO DS system (chapter 2) we turn to theoretical explanations of the WTO system in general and the DS system in particular. There are already sound economic theories of GATT/WTO (chapter 3.1) in general (the principles of reciprocity and of nondiscrimination – embodied in the most-favored-nation (MFN) clause; see, e.g., Bagwell-Staiger, 1999). The aberration from trade talks and international trade agreements may result in trade wars. The interests behind such trade wars – and the presently three most prominent examples Hormones, Bananas and FSC can be interpreted as such - can be analyzed in the context of politico-economic models (chapter 3.2). The question "who wins trade wars" is answered in chapter 3.3. At this stage there is no explicit economic theory of dispute settlement, although some theoretic contributions about the role the WTO can play to facilitate international cooperation and enforcement (see, e.g., Maggi, 1999) are important steps towards an economic theory of DS (chapter 4). As in the case of trade wars, the analysis is done here in a game-theoretic framework. Chapter 5 evaluates the dimension of the actually three most important EC-US trade disputes (Hormones, Bananas, FSC). Some general equilibrium results of these trade wars are presented. These exercises show that the presently used system of retaliation by tariffs in case of non-compliance is ineffective and distorts allocation and should be replaced by a transfer-like retaliation system (conclusions in chapter 6).

---

<sup>2</sup> For a general economic theory of public enforcement of law on a national level, see Polinsky-Shavell (2000).

## ***2. Is the WTO Dispute Settlement System Biased?***

When the Dispute Settlement (DS) system of the WTO had been implemented on January 1, 1995, high hopes had been attached to the system as far as an equal protection and access to this mechanism was concerned. Even WTO's first Director General, Renato Ruggiero hoped that "... by reducing the scope for unilateral actions, it is also an important guarantee of fair trade for less powerful countries" (quoted in Horn-Mavroidis-Nordström, 1999, p. 1).

However, the data collected by Horn-Mavroidis-Nordström (1999, p. 1) from the first four years show a different picture. Developed countries have by far been the most active users of the DS system, with the G4 countries (Canada, EC, Japan and US) accounting for over 60% of all complaints. Three-quarters of the membership has not used the system at all since its inception, and in this group one finds most developing and all the least developed countries. This discussion fits into the broader discussion about tensions between North and South, which have come to the forefront in the preparations for a new round of multilateral trade negotiations. The LDCs claim that they have to comply with burdensome WTO agreements such as the one on protecting intellectual property, whereas larger and powerful countries and trade blocs, such as the EU can allow to "flout" its WTO obligations (e.g., the failure to implement the ruling in the Banana dispute).

The right to bring complaints is firmly laid down in the Dispute Settlement Understanding (DSU; see GATT, 1994, Annex 2)<sup>3</sup>. When a country encounters a trade measure that seemingly violates the WTO Agreement, the first action would normally be to raise the matter directly with the trading partner in question. In many cases, informal bilateral consultations may resolve the problem. However, if the issue can not be settled informally, the Complainant has the right to bring the matter to the WTO for adjudication.

The formal process takes its beginning when a country requests consultation at the WTO. The request includes a brief description of the measure(s) concerned and the legal grounds for the complaint. Third parties can join in the consultations provided that the defendant so agrees (Art. 4.11 DSU). The Respondent is obliged to reply to the request within ten days, and to grant opportunity to consult, in order to resolve the dispute amicably, within thirty days. Should the Respondent refuse to consult on the matter, the Complainant can request the establishment of a panel after thirty days. Otherwise, the consultant period is set to sixty days to allow the parties sufficient time to sort out their differences bilaterally. Should a settlement

be reached, it must be notified to the Dispute Settlement Body (DSB) and the relevant Councils and Committees (Art. 3.5 DSU) in order to ensure that it does not violate any provisions of the WTO Agreement to the disadvantage of other Members. If within sixty days no solution can be reached, and unless parties to the dispute agree to an extension of the consultation period, the Complainant can proceed to the adjudication stage (Art. 4.3 DSU).

The adjudication stage starts with a formal request for a panel inquiry into the matter. Panels will be automatically established the second time such a request appears on the agenda of the DSB (Art. 6 DSU). The composition of the panels will be agreed by the parties or, in case parties cannot agree within 20 days, will be decided by the WTO Director-General (Art. 8.7 DSU). The panel proceedings consist of written submissions and oral hearings where the parties are provided two or more opportunities to present their case before the panelists, and to rebut the legal and factual arguments of the other side. The panelists, with the assistance of the staff of the Legal Division of the WTO, will then issue a report, including the ruling. This report should be circulated within six months after the initiation of the panel (Art. 12.8 DSU), or exceptionally within nine months (Art. 12.9 DSU), unless the parties to the dispute request a suspension of the proceedings (Art. 12.12 DSU). Once issued, panel reports must be adopted within sixty days (Arts. 16.1 and 16.4 DSU), unless one or both sides decide to appeal against the rulings to the Appellate Body (AB).

The mandate of the AB is limited to reviewing the legal arguments of the panel report. The Appellate Body must issue its report within sixty, and in exceptional circumstances, within ninety days (Art. 17.5 DSU). The report must be presented before the DSB for adoption within thirty days from its circulation (Art. 17.14 DSU), and will be adopted unless it is unanimously rejected (the winning party being part of the unanimous vote).

Respondents found guilty of violating the rules will be accorded a “reasonable period of time” to bring inconsistent measures into compliance with their WTO obligations, not exceeding fifteen months (Art. 21.3c DSU). At the end of this period there are two possibilities. If the Respondent takes no action towards compliance, the Complainant can request authorization to take countermeasures (Art. 22.2 DSU), which will be granted within ten days (Art. 22.6 DSU). These measures have to be “equivalent to the level of nullification or impairment” (Art. 22.4 DSU), and thus do not allow for any form of punitive damages. On the other hand, if the Respondent did take some action towards compliance, but the actions are deemed

---

<sup>3</sup> The following short description of the DS process is taken from Horn-Mavroidis-Nordström (1999, p. 3-4) and amended by own adjustments.

unsatisfactory by the Complainant, recourse must be made within ninety days to the original panel, if possible, to rule on the adequacy of implementation (Art. 21.5 DSU).

Compensation and the suspension of concessions or other obligations are temporary measures available when the recommendations and rulings are not implemented within a reasonable period of time (Art. 22.1 DSU). In considering what concessions or other obligations to suspend, the Complainant shall apply the following principles and procedures (Art. 22.3 DSU):

- (a) the general principle is first to seek to suspend concessions or other obligations referring to the same sector(s)<sup>4</sup> (“*parallel retaliation*”).
- (b) if that is not practicable with respect to the same sector(s), the complaining party may seek to suspend concessions or other obligations in other sectors under the same agreement (“*cross-sectoral retaliation*”).
- (c) if the complaining party feel that measures under (b) are not effective, it may seek to suspend concessions or other obligations under another covered agreement (“*cross retaliation*” as in Ecuador’s Bananas case).

Formally, all WTO Members have a right to seek adjudication for their trade grievances. However, there may be other impediments that hold back certain Members from exercising this right (see Horn-Mavroidis-Nordström, 1999, p. 4). First, the legal proceedings are often lengthy, and may involve considerable costs, which poor countries cannot afford<sup>5</sup>. Second, small countries may be discouraged from bringing complaints if their prospects of enforcing rulings in their favor are bleak because of limited retaliatory power. Or, small developing countries may exercise self-constraint in picking their fights in order not to jeopardize privileges they depend on, including development aid and unilateral trade preferences (e.g., Ecuador, in the Bananas case).

Many other problems surround the DS procedure. One is the alleged tactic of retarding in complying with the DSB ruling, an allegation raised by the USA in connection with the recalcitrant EU in adapting its Common Organization of the Market in Bananas (see Mavroidis, 2001, p. 34). Another big problem is the calculation of the “equivalent level of nullification and impairment” in accordance with Art. 22.4 DSU. This quantification exercise is simply delegated to economists by lawyers (see Mavroidis, 2001, p. 7). But, as one sees from the very few cases of retaliations under the DS system (see chapter 5), on the one hand

---

<sup>4</sup> Art. 22.3 (f) DSU defines “*sector(s)*” (i) with respect to goods, as “*all goods*”; (ii) with respect to services, a “*principal sector*” as identified in the current “Services Sectoral Classification List”.

the calculations made by economists are not clearly explained (see WTO, 1999a, 2000) and even upon request the details of the calculations are not supplied by the WTO. More transparency is needed here. As we will see later the problem of controlling how the retaliatory tariffs are collected is ignored completely in the DSU law.

With a simple probabilistic model of litigation, Horn-Mavroidis-Nordström (1999) show that the probability of encountering disputable trade measures is proportional to the diversity of a country's exports over products and partners, which means that larger and more diversified exporters would be expected to bring more complaints than smaller and less diversified exporters. The predictive power of this model is quite good and is further enhanced when the cost of litigation is accounted for. However, there are some outliers, that are countries with disproportionate number of complaints, notably Canada, the EU and the USA.

The Bananas dispute is a complex case insofar as it involves many countries and different WTO Agreements. In September 1995, four countries requested consultation with the EC regarding its banana regime implemented on July 1993, which was assigned the WTO Disputes Series number 16. This complaint was superseded in February 1996 by a renewed request for consultation, with number 27, filed by the four initial Complainants and a fifth country. As Horn-Mavroidis-Nordström (1999, p. 9-10) are interested in counting bilateral relationships, they count Bananas as five separate disputes: EC vs. Ecuador, Guatemala, Honduras, Mexico, and the US, respectively. Since the complaints covered several provisions of the banana regime, including violation of the MFN tariff, discriminatory allocation of export licenses among exporting countries, discriminatory allocation of import licenses among distributors of bananas, one could further subdivide the dispute into various "subject-matters". The Banana case would then be treated as  $5 \times 3 = 15$  separate disputes. According to these counting procedure, Horn-Mavroidis-Nordström (1999, p. 10) obtained 146 "bilateral disputes" (BD) filed with the WTO 1995-98. As complainants, 25.3% of which concern the EC, 24% the USA, 8.9% Canada, and 5.5% India. As Respondents, 21.9% concern the EC, 19.9% the USA, and 8.2% India and Japan, respectively.

---

<sup>5</sup> Although Art. 24 DSU addresses the special situation of least-developed countries. In Art. 24.2 DSU the legal

**Table 1: Distribution of complaints over Agreements, 1995-1998**  
(percent)

<b>Agreement</b>	<b>G4</b>	<b>Other OECD</b>	<b>Non-OECD LDC</b>	<b>All</b>
Agriculture	9.7	21.1	10.4	11.3
DSU	1.1			0.7
Dumping	1.7	18.4	2.6	4.1
GATS	4.0	2.6	5.2	4.1
GATT	34.1	34.2	39.0	35.4
Licensing	5.1	15.8	10.4	7.9
Rules of Origin	0.6		1.3	0.7
Procurement	1.7			1.0
Safeguard	1.1		2.6	1.4
SPS	7.4	2.6	1.3	5.2
Subsidies	10.2		3.9	7.2
TBT	7.4	2.6	7.8	6.9
Textiles	1.7		7.8	3.1
TRIMS	5.7	2.6	5.2	5.2
TRIPS	6.8			4.1
Valuation	1.7		2.6	1.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

G4 = Canada, EC, Japan, USA.

Other OECD = 27 industrial countries minus the G4 group of countries.

Non-OECD, LDC = countries outside the 27 OECD countries.

LDC = 27 countries out of the 113 countries having this status.

Source: Horn-Mavroidis-Nordström (1999), p. 24.

Looking at sectors, Horn-Mavroidis-Nordström (1999, p. 22-23) find that Agriculture and Foods is by far the dominant sectors in terms of complaints (34.4%), followed by the miscellaneous “General Goods” (11.9%), Textiles (8.8%) and Vehicles (7.5%). What is interesting about the disputes over Agriculture and Food is the complexity of these disputes, as evidenced by the wide range of other Agreements (besides the Agreement on Agriculture) that are invoked in such cases. Almost all Agreements have been invoked in disputes involving agricultural products. But there is no bias towards the G4 countries in case of complaints concerning Agriculture and Food. The G4 with only 24.2% of complaints in the Agriculture and Food sector, are below average (34.4% in this sector), whereas other OECD countries as well as Non-OECD and LDC countries complaint more than proportionally with 47.4% and 52.4%, respectively.

Looking at the Agreements involved, one sees that the share of complaints involving the GATT is roughly the same for all country groups (see Table 1). The main difference across



countries is in the invocation of other Agreements. The non-G4 OECD countries have relatively more complaints under the Agriculture Agreement, and the Understanding on Dumping, than the G4 countries. The latter have in turn relatively more complaints under the Subsidies Agreement, and are also the only countries that have brought complaints under the TRIPS Agreement.

### ***3. From Trade Talks to Trade Wars***

Recent contributions in economic trade theory propose theoretical frameworks within which to interpret and evaluate the foundational principles of GATT. Another strand of literature explains with political-economy models the forces behind trade negotiations and – if they do not succeed – trade wars. Trade and tariff wars occur when the co-operative approach of the WTO does not succeed or if WTO members start with non-compliance of WTO rules. Such trade wars are games which not all countries can win.

#### **3.1 An Economic Theory of WTO**

World trade consists of a web of bilateral relations in which large (powerful) and small (powerless) countries participate. From optimal-tariff literature one knows that for a dominant player in world trade without the possibility of retaliation by its trading partners, the optimum tariff is equal to the inverse elasticity of domestic excess demand (or foreign excess supply;  $t^o = 1/h$ ). These optimal tariffs are very high (more than 100%), as a rule higher than the actual current tariffs (Whalley, 1985, p. 235). The optimal tariff for a small country (because it cannot influence the world supply,  $h = \infty$ ) would then be zero (i.e. free trade). That means that the starting position (and the implications for welfare) for trade liberalization are quite different for large and small countries. This has the important implication that the larger countries and regions tend to lose from unilateral reductions in protection, which move them further away from their optimal level of protection. Only mutual or co-operative tariff reductions can benefit all countries<sup>6</sup>. This highlights the importance of the WTO negotiations

---

<sup>6</sup> In a two-country general equilibrium tariff game model one can exactly derive these results (see McMillan, 1986, p. 24-33). A Nash equilibrium in tariffs occurs when country 1's tariff is optimal given country 2's tariff and vice versa for country 2. In this case the optimal tariffs coincide with the Nash tariffs. Nash equilibrium means a non-cooperative equilibrium. Any mutual tariff reductions starting from a Nash equilibrium benefit both countries. The Nash equilibrium has the property of being simultaneously individually rational and collectively irrational. Neither country can, by its own actions, make itself better off than at the Nash equilibrium. However, if some degree of co-operation can somehow be achieved (e.g. by WTO negotiations), both countries can be made better off by simultaneous tariff reductions. From here, it does not follow that both countries would be better off if tariffs were reduced all the way to zero. As Whalley (1985) has demonstrated with simulations one country – but not both – may be better off at a Nash equilibrium than under free trade. A country might gain from a tariff war if its import price elasticity is higher than the other country's. The outcome of the tariff game is also different if one starts the mutual tariff reduction from an arbitrary (not necessarily Nash) initial set of positive tariffs. If the current tariff exceeds the Nash equilibrium tariff, then country 1 must be made better off by its tariff reduction. Only if (and this is the actual case in world trade) the current tariff is small relative to the Nash equilibrium tariff could a country possibly be harmed by bilateral tariff reductions (MacMillan, 1986, p. 31). GATT/WTO negotiations (a tariff-setting game) for a co-operative and therefore mutual tariff reduction can also be interpreted as a repeated game.

for a co-operative solution to bring together the different interests of large and small, rich and poor countries, resulting in world-wide trade liberalization. Through the eight rounds of trade negotiations that have followed since the inception of GATT in 1947, average ad valorem tariffs on industrial goods have fallen significantly from over 40 percent to less than 4 percent. Over the same period of time, membership in GATT (and now its successor organization, the World Trade Organization – WTO) has risen from 23 countries to well above 140.

Despite the important role played by GATT in the world economy, however, economists have not yet developed a unified theoretical framework that interprets and evaluates the principles of GATT. Exactly that missing link is supplied by Bagwell-Staiger (1999)<sup>7</sup> by formulating an *economic theory of GATT*. Working within a general equilibrium trade model (two countries and two goods), they represent government preferences in a way that is consistent with national income maximization but also allows for the possibility of distributional concerns as emphasized in leading political-economy models. Using this general framework, they establish that GATT's two "pillars", the principles of reciprocity and non-discrimination (MFN clause) can be viewed as simple rules that assist governments in their effort to implement efficient trade agreements.

Bagwell-Staiger (1999, p. 221) from their 2x2 general equilibrium model derive nine propositions. They assume that governments seek reciprocal trade agreements to achieve mutually beneficial changes in trade policy. Through a reciprocal trade agreement (i.e., mutual reductions in tariffs) governments seek tariff changes that result in Pareto improvements for member countries (as measured by governments welfare ( $W$ ) as a function of the local ( $p$ ) and world prices ( $p^w$ ) that the tariffs imply) over what could be achieved by unilateral tariff setting (Nash equilibrium tariffs). By doing this, they derive the first three propositions:

*Proposition 1:* Nash equilibrium tariffs are inefficient

*Proposition 2:* A reciprocal trade agreement must entail reciprocal trade liberalization

*Proposition 3:* Politically optimal tariffs are efficient.

Nash equilibrium tariffs are defined as a pair of domestic and foreign tariffs ( $\mathbf{t}^N, \mathbf{t}^{*N}$ ) which simultaneously satisfy:

$$(1a) \quad \text{Home: } W_p + \mathbf{I}W_{p^w} = 0,$$

---

<sup>7</sup> For a survey on earlier attempts by other authors, see Staiger (1995).

$$(1b) \quad \text{Foreign: } W_p^* + \mathbf{I}^* W_{p^w}^* = 0.$$

This approach enables the authors to isolate the effects of a tariff increase on local prices (first terms in (1a) and (1b) and world price movements (the terms-of-trade externality; second terms in (1a) and (1b)).  $\mathbf{I} \equiv [\partial \tilde{p}^w / \partial \mathbf{t}] / [dp / dt] < 0$  (and similarly for the foreign country) means the partial derivatives (the change in world prices relative to domestic price changes when the tariffs change). If for instance the home country's government increases its tariffs local prices in home go up (implying negative welfare effects because of efficiency losses for consumers and producers) and world prices go down (positive terms-of-trade effects; improves welfare).

These results reflect a familiar intuition. When a government imposes an import tariff, its terms of trade improve, and part of the cost of this policy is borne by its trading partners, whose products sell at a lower world price. This "terms-of-trade externality" implies that the government faces less than the full costs of protecting its import-competing sectors. As a consequence, governments oversupply policies directed toward import protection. A reciprocal trade agreement can therefore benefit all governments if it serves as a mechanism through which the protection levels of each country can be reduced. The general model of Bagwell-Staiger (1999, p. 222) has the property that the terms-of-trade externality is the *only* inefficiency that a reciprocal trade agreement can remedy. To establish this conclusion they consider a hypothetical world in which governments are assumed not to value the terms-of-trade effects that their unilateral tariff choices imply (e.g., if all participating countries would be small).

Therefore the authors define politically optimal tariffs as any tariff pair  $(\mathbf{t}^{PO}, \mathbf{t}^{*PO})$  that simultaneously satisfies:

$$(2a) \quad \text{Home: } W_p = 0,$$

$$(2b) \quad \text{Foreign: } W_p^* = 0.$$

Figure 1 illustrates the implications of the three propositions and the general purpose of a reciprocal trade agreement (see Bagwell-Staiger (1999, p. 224)).

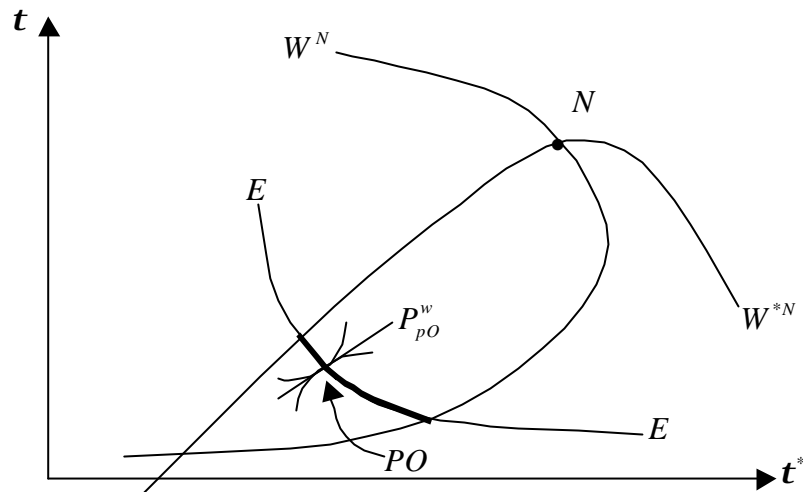


Figure 1: The purpose of a reciprocal trade agreement

As proposition 1 indicates, the Nash tariffs (point  $N$ ) lie off of the efficiency locus (the curve  $E \rightarrow E$ ). The figure also depicts the Nash iso-welfare curves for the domestic and foreign governments ( $W^N, W^{*N}$ ), and these curves illustrate the message of proposition 2: relative to the Nash equilibrium (with higher tariffs in both countries), a trade agreement can increase the welfare of both governments only if the agreement calls for a reduction in both tariffs. Finally, proposition 3 requires, the politically optimal tariffs (point  $PO$ ) lie on the efficiency locus. The iso-welfare curves are tangent at every point along this locus. Also the iso-welfare curves are tangent to the iso-world-price locus ( $p_{pO}^w$ ). The bold portion of the efficiency locus correspond to the contract curve. So Figure 1 demonstrates the general purpose of a reciprocal trade agreement. When governments interact unilaterally, the associated Nash tariffs are inefficient as a consequences of the terms-of-trade externality.

The question is how the trade agreements should be designed? There are two basic approaches. In a “rules-based” approach, governments agree to certain principles under which subsequent negotiations will be undertaken. Alternatively, governments might adopt a “power-based” approach in which they bargain in a direct fashion that is not constrained by agreed-upon principles of negotiations. Within WTO, governments chose to adopt a rules-based approach, and two foundational rules of GATT are reciprocity and nondiscrimination.

*Reciprocity* is defined in a practical fashion (Bagwell-Staiger, 1999, p. 224). Hence, mutual changes in trade policy that conform to reciprocity leave world prices unchanged (the terms-of-trade effect is neutralized). To put it otherwise, unilateral tariff choices are inefficient if

and only if governments are motivated by their abilities to change the world price. This implies that unilateral sanctions (also under the safeguard of the WTO DS process) can lead to unpleasant terms-of-trade externalities (e.g., in the Bananas case). The principle of reciprocity can also be associated with the informal idea that governments seek a “balance of concessions” (i.e., reciprocal tariff cuts).

Further propositions (e.g., proposition 4) say that beginning at a Nash equilibrium, reciprocal trade liberalization that conforms to reciprocity will increase each government’s welfare monotonically until this liberalization has proceeded to the politically optimal outcome. In the symmetric case (both countries are large) a negotiated mutual reduction in tariffs that conforms to the principle of reciprocity results in a higher trade volume without a terms-of-trade loss for either government (Bagwell-Staiger (1999, p. 226). In the asymmetric case (one country is large and the other is small), the mutual benefits from further liberalization may terminate before the efficiency locus (the politically optimal tariff) is reached.

A further application of reciprocity concerns the manner in which countries may lawfully renegotiate a previous agreement. The negotiation process (or game) entails three stages (Bagwell-Staiger (1999, p. 228). In the initial negotiation stage, governments agree to bind their tariffs at specified levels. The second stage is a renegotiation stage, where any renegotiation satisfies the restriction of reciprocity, resulting in mutual changes in tariffs that preserve the world price from the first stage. In the third stage, the tariffs that are implemented are those that achieve the greatest trade volume consistent with the restriction of reciprocity. These three stages together form, what Bagwell-Staiger (1999, p. 236) call the Multilateral Negotiation Game under GATT/WTO. From this the important proposition 7 follows: An efficient multilateral trade agreement can be implemented under reciprocity if and only if it is characterized by tariffs which conform to the (second GATT) principle of *nondiscrimination* (MFN clause)<sup>8</sup> and are set at their politically optimal levels.

To sum up, GATT’s major principles, reciprocity and nondiscrimination are thus simple rules that, when used together, can deliver an efficient outcome. Nondiscrimination (the MFN clause) ensures that all international externalities are channeled through world-price movements, and the principle of reciprocity serves effectively to neutralize externalities of exactly this nature (terms-of-trade effects; Bagwell-Staiger, 1999, p. 237). One is therefore staggered by the fact that this general rules are somehow broken in case of the DS process of

---

<sup>8</sup> A broad (more legal than economic) analysis of the importance of the MFN clause can be found in Horn-Mavroidis (2001).

the WTO, when allowing retaliatory (unilateral) tariff increases as sanctions against countries which trade laws are not consistent with WTO rules.

### 3.2 A Political-Economy of Trade Wars

When governments meet in the international arena (e.g., in GATT/WTO negotiations), their actions reflect the political situation at home. Previous studies of trade relations have focused on governments that are immune from political pressures and that act as benevolent servants of the public interest. In his seminal paper on “Optimum Tariffs and Retaliation”, Harry Johnson (1953-54; 1958) showed how policy interdependence between governments could be modeled as a non-cooperative equilibrium of a two-country tariff game. In Johnson’s analysis and in that of his followers (e.g., Hungerford, 1991; for a survey of the political science literature, see Rodrik, 1995), the government is interpreted as a benevolent servant of the national interest. However, in democracies, trade policies are set by elected representatives with sometimes different interests (protectionists versus free-trade proponents).

In the following we present the major insights of the Grossman-Helpman model (1995) which build on a strategic interaction between interest groups and politicians in the domestic arena and strategic interaction between governments in the international arena. The result is a “two-level-game”. Lobby groups represent factor owners with stakes in certain industries. Each lobby confronts its national government with a campaign contribution schedule, that is, a schedule relating its promised gift to the action taken by the government. Faced with the contribution schedules of the various lobbies, the incumbents choose a vector of trade taxes and subsidies on the various import and export goods. Their objective in this is to maximize their own political welfare.

As a result of this two-country model with governments and lobbyist Grossman-Helpman (1995, p. 688) derive the equilibrium policy (tariffs/subsidies) for the home and foreign country. The home country’s equilibrium policy is:

$$(3a) \quad \mathbf{t}_i^0 - 1 = -\frac{I_{iL} - \mathbf{a}_L}{a + \mathbf{a}_L} \frac{X_i}{\mathbf{p}_i M_i^*} + \frac{1}{e_i^*},$$

where  $e_i^* \equiv \mathbf{t}_i^* \mathbf{p}_i M_i^{*'} / M_i^*$  is the elasticity of foreign import demand or export supply (depending on whether  $M_i^*$  - the net imports - is positive or negative).  $X_i$  is the domestic supply of good  $i$ .  $\mathbf{t}_i^0$  is either an import tariff or export subsidy or an export tax on good  $i$ .  $\mathbf{p}_i$  is the world price of good  $i$ .  $I_{iL}$  is an indicator variable that equals one if industry  $i$  is

politically organized and zero otherwise, and  $\mathbf{a}_L \equiv \sum_{j \in L} \mathbf{a}_j$  is the fraction of voters that are represented by a lobby. The parameter  $a$  represents the government's weighting of a dollar of social (national) welfare compared to a dollar of campaign contribution.

The equilibrium foreign trade policy is (with similar parameter and variable interpretation as in equation 3a, except that for foreign  $a^*$  is used):

$$(3b) \quad \mathbf{t}_i^{*0} - 1 = -\frac{I_{iL}^* - \mathbf{a}_L^* X_i^*}{a^* + \mathbf{a}_L^* \mathbf{p}_i M_i^{*'}} + \frac{1}{e_i},$$

where  $e_i \equiv \mathbf{t}_i \mathbf{p}_i M_i' / M_i$  is the home country's import demand or export supply elasticity.

Equations (3a) and (3b) express the ad valorem trade tax and subsidy rates in each country as sums of two components. These components represent, respectively, the *political support* (first term of the equations) and *terms-of-trade* motives (second term of the equations) of large countries (the familiar "optimum tariff" or export tax argument) that applies in a large country with a benevolent dictator (for a small country this term would be zero).

With this instrument at hand one can analyze the special Bananas dispute as a trade war between the EU and the USA (taking advantage of the special single industry case of Grossman-Helpman, 1995, p. 690-694) where lobbyist play an important role. In this special case of a single industry  $i$  both countries have constant trade elasticities. The home country (in our case the EU) is the importer of Bananas. Then its import demand curve is given by  $M = m(\mathbf{t}\mathbf{p})^{-e}$ , with  $m > 0$  and  $e = -e_i > 1$ . The foreign country's (in our case the USA) export supply function has the form  $-M^* = m^*(\mathbf{t}^*\mathbf{p})^{e^*}$ , with  $m^* > 0$  and  $e^* = e_i^* > 0$ .



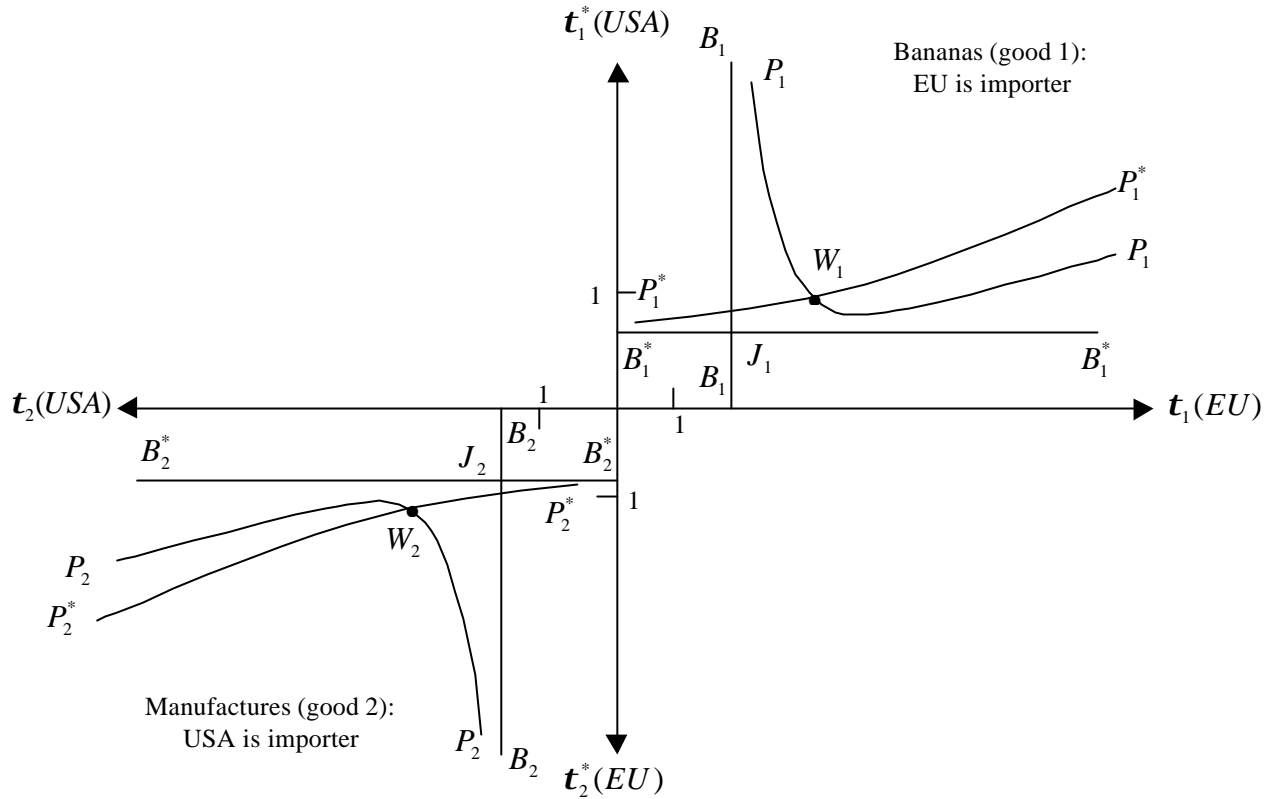


Figure 2: Bananas Trade war between the EU and the USA

Figure 2 shows two stages of the Bananas trade war: in the first move, the EU introduces its Common Organization of the Market in Bananas which does not comply with WTO rules (represented by the north-east quadrant). Here, it is interpreted simply as if the EU introduced WTO violating tariffs for good 1 (bananas), motivated by EU lobbyists. In the second move, the WTO allows the USA to introduce retaliatory tariffs on a variety of EU's manufactured goods (represented by the south-west quadrant) which are treated here as a single (manufactured) good 2. These figures show the Johnson equilibria at points  $J_1$  and  $J_2$  for both goods respectively. These points lie at the intersection of two best-response functions.  $B_1B_1$  and  $B_1^*B_1^*$  for the home country and  $B_2B_2$  and  $B_2^*B_2^*$  for the foreign country, where  $B$  refers to the benevolent dictators that rule each country and hence, where lobbyists play no role. The curves are vertical and horizontal, respectively, in the constant elasticity case. The inverse elasticity rule gives the equilibrium policies in the Johnson equilibrium,  $t_j = 1 + (1/e^*)$  and  $t_j^* = 1 - (1/e)$ . These are, of course, a tariff at home ( $t_j > 1$ ) and an export tax abroad ( $t_j^* < 1$ ; if  $t_j^* < 1$ , one would call it an export subsidy abroad).

Figure 2 shows the effect if lobbyist influence the trade policy in both countries. If for both goods in both countries there are active lobby groups (in case of the EU, e.g., the former colonies of France and Spain; in the case of the USA the bananas exporters; i.e.,  $I_L = I_L^* = 1$ ), the home country's (EU) equilibrium response functions are represented by  $P_1P_1$  and  $P_2P_2$  ( $P$  for political) and the foreign country's by  $P_1^*P_1^*$  and  $P_2^*P_2^*$  respectively. The  $PP$  curves lie everywhere to the right of  $BB$  and have a U-shape: it asymptotes to  $BB$  at  $t = 1 + (1/e^*)$  and to a ray from the origin as  $t$  grows large. The  $P^*P^*$  curves lie everywhere above  $B^*B^*$  and always slopes upward.

Points  $W_1$  and  $W_2$  depict the political equilibria in the bananas trade war. These points lie to the northeast (southwest) of the Johnson equilibria at the points  $J_1$  and  $J_2$  respectively. Evidently, the politically motivated governments tilt trade policies in favor of their organized special interests; at home tariff is higher in the political equilibrium than in the Johnson equilibrium, whereas the US export tax (in the case for good 1) is lower or possibly even a subsidy and in the case of good 2 the same is true for the EU. One sees now easily from the equations (3a) and (3b) that changes in the lobbyists influence change the optimal outcome. A decline in  $a$  for instance causes the  $P_1P_1$  curve to shift up, resulting in a new equilibrium with a higher home tariff and lower foreign export tax. The rise in the import tariff and the fall in the export tax have offsetting implications for internal prices in each country. The increase in the home tariff raises the home price despite the resultant improvement in the terms of trade, but the fall in the foreign export tax pushes the home price down via its effect on the world price. In the Grossman-Helpman model context, the retaliation by the USA led to a reaction by the EU. It gradually adapted the Bananas market organization. This can be interpreted as a diminishing influence of the lobbies in the EU, leading to a decline in  $a$  and, hence leading to a shift down of the  $P_1P_1$  curve towards the  $J_1$  point (northeast part in Figure 2). This implies that the EU is gradually complying with WTO rules. As a consequence, in July 2001 the USA abolished the retaliatory measures, leading to a decline in  $a^*$  and, hence also to a shift of the  $P_2P_2$  curve towards the  $J_2$  point (southwest part in Figure 2).

What are the conclusion for the Bananas case? The lobby induced protectionist stance of the EU banana regime led to a welfare loss for EU consumers (in spite of a slight increase in terms-of-trade; see the results of Badinger-Breuss-Mahlberg, 2001 in a partial-analytical approach). The USA sanctions (the permission by the WTO to introduce retaliatory tariffs on manufactured goods) led to a slight increase in welfare in the USA and a decrease in the EU,

in spite of slight terms-of-trade gains by the USA. Last but not least the Bananas case has run in a two-years trade war between the USA and the EU. In 2001, trade talks have again ended this mini-trade war.

### 3.3 Who wins Tariff Wars?

It is well known from optimum tariff theory that large countries can manipulate the terms of trade to their advantage by using tariffs. It is widely believed, however, that this invites retaliation, and that the post-retaliation equilibrium leaves all countries worse off than they would be at free trade. Kennan-Riezman (1988) present a simple pure exchange model and show which endowment patterns are consistent with this belief. In this model, they find that if one country is substantially bigger it can expect to gain from a tariff war, despite retaliation. This is a bad message for WTO and its DS system. This explains somehow why the G4 players are the most active participants in this system. If the large players in world trade, like the USA and the EU, to some degree also Japan are not willing to comply with WTO rules, meaning that they are more protective than negotiated in trade agreements, this will be to their benefit. Even if small (and this is even more so true for LDCs) countries are allowed by WTO DS decisions to implement retaliatory measures, it would not be to their benefit if the large players do not comply.

John Whalley (1985, chapter 14) evaluates the winners and losers of potential trade and tariff wars by applying four- and seven-region CGE (computable general equilibrium) models with up to 33 sectors. First, he was interested in calculating optimum tariffs<sup>9</sup> with and without retaliation in a sequence of simplified two-good, two-country trade CGE models. With full preference and production functions as well as conventional CES and LES functional forms, he determines numerically Nash (post-retaliation), free-trade, and autarky equilibria. These equilibria can be compared and optimal tariffs can be calculated, with and without retaliation. Second, he shows the implications for trade liberalization within GATT/WTO.

With his 2x2 CGE model Whalley (1985, p. 236) demonstrates in a sequence of cases the change in utility. Utility in autarky is always lower than in case of free-trade (utility is equivalent to 100 units). A (large) country may gain a tariff war if its import-price elasticities are larger than those of its partner. If for instance the import-price elasticity of country 1 is  $-4$

---

<sup>9</sup> The optimal tariff is defined as:  $t^O = 1/(\mathbf{h}_M^D - 1)$ , where  $\mathbf{h}_M^D$  is the price elasticity for import demand; if this elasticity is – as empirical studies suggest - close to zero, then the optimum tariff can reach 100% (large country case); if the price elasticity is close to infinity, the optimum tariff is zero (small country case).

and that of country 2 is  $-1$ , then country 1 would gain a utility level at post-retaliation (Nash) equilibrium of 110.7, whereas country 2 would only result in a post-retaliation utility level of 82.0 (compared to 100.0 for both countries in case of free trade). The corresponding optimal tariffs at post-retaliation (Nash) equilibrium would be 185.3% in country 1 and 26.2% in country 2. With import-price elasticities at free trade set at  $-2$  in both countries, country 1 has a first-step optimal tariff of 58% but a post-retaliation optimal tariff of 42%. The implication is that a worldwide tariff war would produce tariffs significantly higher than existing tariffs in the world economy. Tariffs in the region of 50% and higher might thus not be unrealistic as optimal tariffs in a retaliatory-trade-war scenario. Remember that the WTO allowed the USA to increase its tariffs by 100% in retaliation against EU products in the Bananas case. Such countervailing duties are close to the theoretically calculated optimal tariffs!

The case is getting even worse, if one analyses asymmetric countries, measured by different endowments with factors of production (capital, labor etc.). The relative sizes of the two countries make a substantial difference as to whether a country will gain from a retaliatory tariff war, and also as to the size of the calculated optimal tariffs (see Whalley, 1985, p. 244-245). Moving from a situation of equal size to one of dominance by country 1 (e.g. the USA versus Canada) makes country 1 a gainer in a trade war. Interestingly, the post-retaliation optimal tariffs in country 1 first rise and then fall as the relative size of country 1 increases. If for instance country 1 is so dominant as to dispose of 99% of good 1 and 75% of good 2 and country 1 only possesses 1% of good 1 and 25% of good 2, then utility at free trade in country 1 is 174.0 and in country 2 only 26; utility at post-retaliation (Nash) equilibrium in country 1 is then 178.1 and in country 2 only 18.6. The equivalent post-retaliation optimal tariffs are 168.2% in country 1 and only 8.6% in country 2.

**Table 2: Welfare implications of optimal tariffs in a four-region CGE model**  
(Compensation variations – CV as % of GDP)

Countries/regions	EU	USA	Japan	ROW	Total
EU replaces existing tariffs by uniform tariff at 150%	+2.1	-0.3	+0.3	-2.8	-0.2
USA replace existing tariffs by uniform tariff at 145%	-0.8	+2.2	-1.3	-1.5	-0.2
Japan replaces existing tariffs by uniform tariff at 150%	-0.1	-0.3	+2.3	-0.8	-0.1
Simultaneous adoption of uniform tariffs at 175% in EEC, 160% in USA, 200% in Japan, 178% in ROW	-5.0	-2.2	-5.1	-1.4	-3.2
Simultaneous adoption of uniform 60% tariffs in all trading areas	-2.1	-0.3	-2.1	-0.1	-1.0

Source: Whalley (1985), p. 248; we report only one “optimal” tariff per country instead of four in the original Whalley table 14.6, because the welfare results are essentially the same.

Because of the expense of repeated solution it is not possible to compute a Nash equilibrium in the presence of retaliatory tariffs with a four-region CGE model (Whalley, 1985, p. 247). But it is possible to calculate approximately a “first step” optimal tariff for each region through iterative calculations. The tariffs reported in Table 2 (here we skipped other optimal tariff levels because they results in similar welfare effects<sup>10</sup>) are substantially above the levels for optimal tariffs suggested by the earlier 2x2 model calculations, primarily because of the low trade-elasticity values used in the four-region model. The welfare loss from the combined imposition of all calculated “first step” optimal tariffs produces a worldwide loss in the region of 3% of worldwide GDP, which suggests this figure as an upper bound of the possible worldwide loss from a retaliatory tariff war. A tariff-war-like situation, where all regions adopt simultaneously a uniform tariff of 60% (last row in table 2) sees the USA and the Rest of the World (ROW) as the relative winners. The EU and Japan would lose welfare at the

<sup>10</sup> Whalley (1985, p. 248) uses two kinds of welfare measures. One is the Hicksian compensation variation (CV), which is the amount of money needed to compensate an agent for a change that has occurred so as to return him to his prechange utility level (i.e., the income change that, beginning from the postchange equilibrium, would compensate the agent for the effects of the change – e.g. through a variation of import tariffs and therefore domestic prices). The second welfare measure is called equivalent variation (EV), which is the amount of money that is equivalent to a change that has already taken place (i.e., the income change that, beginning from the prechange equilibrium, would move the agent to his postchange utility level). In addition to these welfare measures often the terms-of-trade effects is also included in an overall welfare change after trade policy changes (see Whalley, 1985, 126-130). The compensating variation can also be written:  $CV = \left[ \frac{U^N - U^0}{U^N} \right] I^N$ , where  $U^N$  ( $U^0$ ) is the new (old) utility level, and  $I^N$  is household income (see Shoven-Whalley, 1992, p. 125).

same amount. The world as a whole would suffer also a welfare loss. The threat of renewed global protection produced by retaliatory trade wars of the type analyzed here is widely agreed upon to be more significant today than at any other time in the postwar period.

**Table 3: Welfare effects of a global tariff war in a ten-region CGE model**

<b>Regions</b> (simultaneous adoption of a uniform 100% tariff in all regions)	<b>CV</b> (bill. US\$)	<b>Terms of trade</b> (% change)	<b>Export volume</b> (% change)	<b>Real GDP</b> (% change)
Australia	-30.7	-5.8	-64.8	-7.7
North-America ( USA+Canada)	-214.8	1.9	-81.4	-3.7
EU	-243.5	2.3	-77.7	-4.0
Japan	-253.6	-12.8	-41.1	-2.9
Newly industrializing countries	-91.4	8.9	-86.2	-19.1
Asian countries	117.8	30.9	-96.7	-28.7
China	-80.1	-12.5	-59.1	-12.3
Africa	-15.6	-0.5	-81.1	-4.9
Latin America	-74.2	6.1	-87.2	-7.0
ROW	-252.4	-0.4	-71.9	-8.5

Source: Own simulations with the GTAP world CGE model.

Own simulations with the GTAP ten-regions seven sectors world CGE model show similar results (see table 3). In a world-wide tariff war where each region simultaneously increases all their tariffs by 100% most of the regions are losers measured by CV and real GDP (an exception are the Asian countries concerning CV because of terms-of-trade gains, but not in GDP). World trade would shrink dramatically as the export volumes of all regions decline by 41% to 97%. These results are also important for the present practice in the WTO DS process which allows to impose retaliatory tariffs in case one country feels to have suffered a loss from other members not complying with negotiated agreements. Although in case of DS retaliation, only one (mostly small) part of a countries trade is concerned, this practice nevertheless points into a wrong direction.

#### ***4. Towards an Economic Theory of Dispute Settlement***

There are only a few economic contributions which theoretically explain the DS process (DSP) of the WTO. One of the most recent and also most general economic theory which tries to understand the DSP is those of Maggi (1999)<sup>11</sup>. He focuses on two roles that the WTO-DSP can perform, both of which are intrinsic to its multilateral nature. First, it can verify violations of the agreement(s) and inform third countries (“information dissemination”), thus facilitating multilateral enforcement efforts. Second, it can promote a multilateral rule-making procedure in place of a web of bilateral negotiations. As the WTO has no direct enforcement power (it can only give the power to members to put pressures on other members via introducing retaliatory measures), there must be indirect mechanism by which an offending country can be “punished”. Which forms can this loss take in reality? First, WTO members can withdraw trade concessions to the defecting country (or introduce countervailing duties, like in the Bananas and Hormone cases). To the extreme case a repeatedly offending country could be expelled from WTO (this is an extreme interpretation of Article XXIII of the GATT!<sup>12</sup>). Second, WTO members can impose costs on the offending government in more subtle ways, by withdrawing some of their “goodwill” toward that government (important for subsequent negotiations; slowing down the general liberalization process or that vis-à-vis the offending country; i.g., under GATS). If country A does not follow the recommendations of the DSP panel, third countries may feel free to do the same in future disputes against such a non-complying country.

The key feature of Maggi’s three-country CGE model of trade (1999, p. 193 ff.) is the presence of bilateral imbalances of power, where the “more powerful” country in a given pair is the one that stands to lose less (or to gain) from a trade war. In this situation, a multilateral enforcement mechanism may be beneficial, because it allows a transfer of enforcement power across relationships that is not possible under bilateral enforcement. Trade negotiations are modeled as a process of Nash bargaining over a set of self-enforcing trade policy configurations. Each of the three countries is endowed with the numeraire (freely traded) good and other traded goods (exported and imported between the three countries). Governments impose import tariffs on nonnumeraire goods. An import tariff creates a wedge

---

<sup>11</sup> In a related, somewhat different analysis, Spagnolo (2001) deals with problems of “sustainable” (self-enforcing) schemes of international agreements. One way to automatically secure compliance could be the “issue linkage”, i.e., two or more policy issues are “linked in one international agreement”, or simply “linked”, when governments agree to cooperate on all these issues and to punish any unilateral deviation. The WTO is not yet ready, to deal with more than with international trade issues. Although, Bronckers (2001) is eager to give “more power to the WTO”.

<sup>12</sup> For this interpretation, Maggi (1999, p. 191) refers to John H. Jackson (1969, pp. 186-187).

between the local price and the offshore (world) price, i.e., the import price is the sum of world prices plus import tariffs. Export taxes and import subsidies are excluded in this model. Consumer' utility consists of the numeraire good plus the consumption possibility of traded goods. Government is assumed to maximize its own citizens' welfare which is given by the sum of profits (from exports), tariff revenues (from imports), and consumer surplus.

In the static (one-shot) trade policy game, governments choose import barriers simultaneously (tariff war). Each country's best-response tariff on its imported good is independent of all other tariffs, and given by the Nash tariff. This optimal (Nash) tariff is strictly positive, as a small tariff generates a second-order loss in consumer surplus (import prices lead to a decline of the demand for imported goods) and a first-order improvement in the country's terms of trade. This is the usual result of optimum tariff analysis without retaliation. In his analysis Maggi (1999, p. 195) imposes a symmetry restriction. Countries are symmetric, but each has one bilateral relationship in which it is a net exporter, and one in which it is a net importer. This is the advantage of a three-country model over two-country models which cannot take such effects into account. Hence, the trade-policy game has the structure of a multilateral prisoner's dilemma, as all countries would be better off under global free trade than at the Nash equilibrium. At the same time, the system is characterized by *bilateral imbalances of power*, in the sense that the partners in each bilateral relationship stand to lose different amounts from a trade war. The more "powerful" country in a given bilateral relationship is defined as the one that loses less (or even gains) if the two countries move from free trade to the static Nash tariffs. In this setting, each country is more powerful than its right partner (the tariff imposed is higher), and weaker than its left partner. Or one could also say that each country is a net importer from the right partner and a net exporter to the left partner, and the net importer is more powerful than the net exporter. An important benchmark is the one in which the trading system is symmetric not only globally but also in every bilateral relationship.

In analyzing the gains from multilateral enforcement, Maggi (1999, p. 196 ff.) plays the supergame, i.e., the infinite repetition of the game just described. In the supergame, governments have the possibility to sustain freer trade than in the one-shot game, by threatening to revert to high protection levels in case of defection (e.g. in the Bananas case the USA tried this with retaliatory tariffs against EU goods over a period of two years: mid-1999 to mid-2001). For this purpose, Maggi (1999, p. 196) interprets the WTO with its DS system as an institution that disseminates information automatically, honestly, and without delay. He



then compares two stylized scenarios: (1) a world without such an institution, in which only bilateral histories are observed (a world with “bilateral monitoring”); and (2) a world with such an institution, in which the entire history is common knowledge (one with “multilateral monitoring”). Two kinds of punishment strategies are defined<sup>13</sup>. (a) A *bilateral enforcement mechanism (BEM)* is a punishment strategy whereby a defection by one country against another is followed by a permanent<sup>14</sup> reversion of (only) these two countries to the static Nash tariffs, and (b) a *multilateral enforcement mechanism (MEM)* as a punishment strategy whereby any defection is followed by permanent Nash reversion in both bilateral relationships which the defector is involved in.

Maggi (1999, p. 198) then derives the following *Proposition*:

- (i) In the presence of bilateral imbalances of power (small and large countries are involved in world trade), countries can sustain a higher symmetric equilibrium payoff (welfare) with multilateral enforcement (MEM) than with bilateral enforcement (BEM).
- (ii) Under bilateral enforcement (BEM), the weaker partner (the smaller country) makes a larger “concession” than the stronger partner (the larger country). The reverse is true under multilateral enforcement (MEM).
- (iii) Absent power imbalances (if all countries would be of equal size), bilateral and multilateral enforcement are equally efficient (BEM = MEM; benchmark case of balanced power).

---

<sup>13</sup> For trade policies ( $\mathbf{t}^L, \mathbf{t}^R$ ; i.e., each country selects the same import tariffs to the left and right partner) to be sustainable, they must provide each country with no incentive to defect; that is, the discounted welfare under these policies must be no less than the discounted welfare achieved by defecting and thereafter reverting to the punishment phase (Maggi, 1999, p. 197).

<sup>14</sup> Maggi (1999, p. 202) differentiates between a permanent (“full”) punishment and a temporary (“partial”) punishment when he analyzes optimal third-party sanctions.

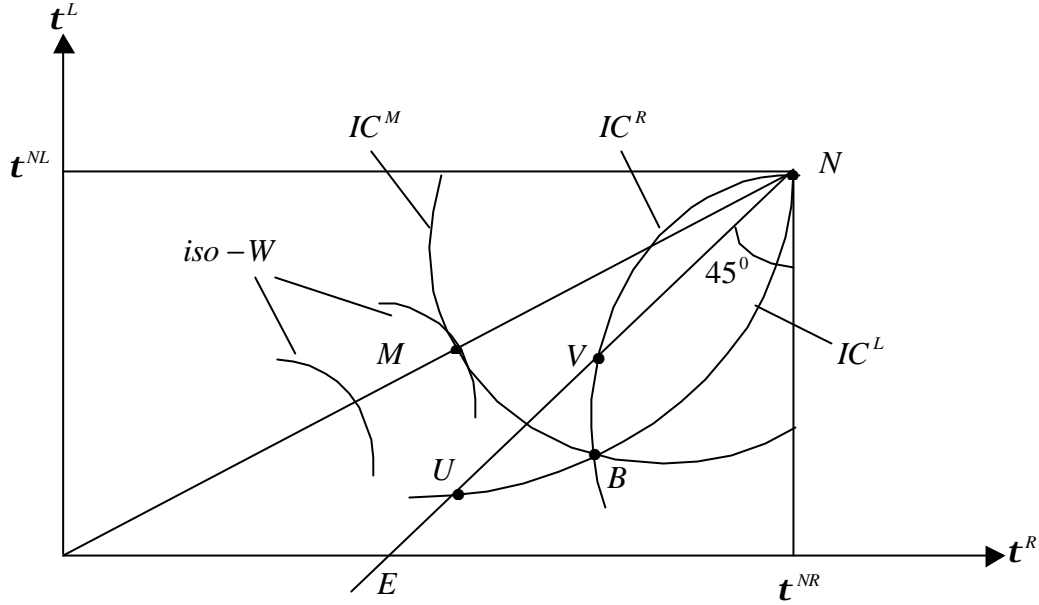


Figure 3: Bilateral and multilateral enforcement

This Proposition is illustrated in Figure 3 (see Maggi, 1999, p. 199). The curves  $IC^L$  (the sustainability condition in the relationship with the left partner) and  $IC^R$  (the sustainability condition in the relationship with the right partner) represent the two bilateral incentive constraints under BEM, taken with equality: when trade policies lie on  $IC^L$  (respectively  $IC^R$ ), the representative country is indifferent between defecting and cooperating with its left (respectively right) partner; the area between curves  $IC^L$  and  $IC^R$  represent the set of sustainable outcomes under BEM. Hence, the optimal BEM agreement is given by point  $B$ . Point  $B$  lies below the 45-degree line that races through the Nash point (line  $NE$ ), which means that the weaker partner makes a larger concession than the stronger partner ( $t^{NL} - t^L > t^{NR} - t^R$ ). Under MEM, on the other hand, the only relevant incentive constraint ensures that a country has no temptation to defect against its left and right partners simultaneously. The curve  $IC^M$  (the incentive constraint in case where a country defects against both partners simultaneously) represents this incentive constraint taken with equality; the sustainable set is given by the area northeast of curve  $IC^M$ . Drawn in Figure 3 are also some iso- $W$  (iso-welfare) curves, i.e., curves along which  $W$  is constant. The optimal MEM agreement is identified by the point of tangency between the  $IC^M$  curve and the iso- $W$  curve closest to the origin (point  $M$ ). Point  $M$  lies on the line connecting the origin with the Nash point ( $N$ ), which implies that under MEM the stronger partner makes a larger concession than the weaker partner ( $t^{NL} - t^L < t^{NR} - t^R$ ). Moreover, point  $M$  lies on a lower iso- $W$  curve

than point *B*, hence multilateral enforcement can sustain a higher symmetric payoff than bilateral enforcement.

The reason why bilateral enforcement is less effective than multilateral enforcement is that, in each bilateral relationship, the gains from cooperation accrue unevenly to the two partners. A conjecture might be that, if pairs of countries could split evenly the gains from cooperation using *international transfers* (with the country that gains less from cooperation receiving the payment), then power imbalances would be neutralized, and multilateral sanctions would become superfluous. Maggi (1999, p. 200-201) demonstrates within his model framework that international transfers are an imperfect substitute for multilateral enforcement. International transfers can mitigate, but not neutralize, the effects of bilateral imbalances of power.

In analyzing the case of *third-party sanctions*, Maggi (1999, p. 204) proposes that they should be minimal in terms of severity, and selective, in the sense that they should be threatened only for violations that are harder to deter with bilateral sanctions alone, such as violations of the strong against the weak.

An important conclusion (already mentioned in chapter 3.1) is that international trade institutions like WTO are important in order to neutralize the imbalances of power in world trade via rule-making procedures. As we have already discussed in chapter 2, there is a bias in utilizing the DS system of the WTO. Maggi (1999, p. 210) reviews some historical (GATT) cases in which the DSP panels ruled in favor of the weaker country. In the most recent cases, the Bananas case for instance, he also asserts that the DSP panel ruled against the powerful EU and in favor of small countries. But in this dispute not only small and poor LDCs were involved as complainants (Ecuador, Guatemala, Honduras, Mexico) but they filed their complaint together with the most powerful county in the world, the USA!

## ***5. The Dimension of the Actual “Trade Wars”: Hormones, Bananas, and FSC***

Since 1995, roughly 146 bilateral disputes were filed with the WTO (see Horn-Mavroidis-Nordström, 1999). As complainants, 25.3% of which concern the EC, 24% the USA, and the rest is distributed to other countries, each involved not more than 9%. As respondent, 21.9% concern the EC, 19.9% the USA, and the rest concerns other countries, each not more than 8%. Up to August 2001, 17 cases (with equal WT/DS-Number; e.g., the Bananas case against the EC was filed by five countries) were launched by EC against other countries. 8 cases (with equal WT/DS-Number) concern complaints of other WTO members against EC. In 24 cases is the EC third party<sup>15</sup>. Out of this large number of DS cases, in only two occasions the WTO-DS authorities (Arbitrators) allowed the complainant party to introduce retaliatory measures against another WTO member. The two cases are the Hormones case and the Bananas case. In a third case, the Foreign Sales Corporation (FSC) case the EU asked for retaliatory measures, but the WTO-DS body did not yet decide on it.

### **5.1 The Hormones Case**

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 (2, 3, 5), TBT (2), Agriculture (4)). The EC measures (prohibiting the importation of meat and meat products that have been treated with growth hormones; 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

---

<sup>15</sup> Source: EU homepage: [http://europa.eu.int/comm/trade/miti/dispute/index\\_en.htm](http://europa.eu.int/comm/trade/miti/dispute/index_en.htm)

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 prove 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 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 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<sup>16</sup>. 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!

### ***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-monopoly scenario which would tell what would annual US exports of hormone-treated beef and beef products to the EC be if the EC had withdrawn the ban on May 13, 1999.

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

**Table 4: Calculation of the level of nullification and impairment in the USA-EC Hormone Case**

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

Source: WTO (1999b), Annex I.

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

<sup>16</sup> The list of products for suspension of concessions proposed by the USA, can be found in Annex II of WTO (1999b).

further assumptions have to be made concerning the volume of the tariff quota (the EC market for HQB exports from the USA and Canada – with or without the ban – is limited by a tariff quota of 11,500 tons at an in-quota tariff rate (TQR) of 20% ad valorem. Then the US share was estimated at 92% (the rest goes to Canada). A further unknown variable is the expected price (this was taken from US suggestions of US\$ 5,342 per ton, although the Arbitrators admit that this price is higher than current unit values of US beef entering the EC!). With these three parameters at hand one can calculate the “hypothetical exports”, given that the TRQ is exhausted (TRQ fill is one). By reducing the current US exports by 25% the value of the “current exports” is estimated. The subtraction of the “current exports” from the “hypothetical exports” gives the damage for HQB as US\$ 32.7 million. A similar exercise (with even more arbitrary adjustments) is made to estimate the damage for EBO (worth US\$ 84.1 million). Together, this gives the total level of nullification and impairment for the USA of US\$ 116.8 million per year (see table 4). Only slight changes in the assumed parameters (US share, price, reduction factor etc.) would change the results ad libitum!

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\$ 233.6 million (US\$ 116.8 over two 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. The welfare implications of this “mini”-trade war between the EU and the USA, can be seen from model simulations with an own calibrated three-region CGE trade model (EU, USA, and the ROW) with seven sectors (see table 5). Three scenarios are simulated. (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 is so calibrated that the trade barriers vis-à-vis the USA in the agricultural sector

implies an increase of import tariffs up to the point where the tariff revenues reach the level of US\$ 116.8 million per year. This is equal to the estimated level of nullification and impairment by the WTO DS decision. (II) In the second scenario, the USA increase their import tariffs in the agricultural sectors as to the point where it gains tariff revenues worth US\$ 116.8 million per year. (III) In the “mini” trade war scenario the implications of the simultaneous actions of both players - which actually happen at the moment as long as the EU does not comply with the WTO rules - are simulated.

**Table 5: Trade Wars EU versus USA: Hormone, Bananas and FSC cases**

Scenario	CV (as % of GDP)		Terms of trade (%-change)		Exports with partner (%-change)		GDP, nominal (%-change)	
	EU	USA	EU	USA	EU	USA	EU	USA
<b>Hormones Case:</b>								
(I)	-0.0030	0.00010	0.0082	-0.0082	-0.03	-0.12	-0.0030	0.0020
(II)	-0.0006	-0.00005	-0.0084	0.0084	-0.08	-0.03	0.0002	-0.0006
(III)	-0.0040	0.00007	-0.0004	0.0004	-0.11	-0.15	-0.0020	0.0010
<b>Bananas Case:</b>								
(I)	-0.005	0.0002	0.01	-0.01	-0.05	-0.19	-0.004	0.003
(II)	-0.002	0.0002	-0.02	0.02	-0.02	-0.03	-0.003	0.003
(III)	-0.007	0.0004	-0.01	0.01	-0.08	-0.22	-0.005	0.006
<b>Foreign Sales Corporation (FSC) Case:</b>								
(I)	0.054	-0.004	1.05	-1.04	0.27	2.06	0.03	-0.080
(II)	0.030	-0.004	1.01	-1.00	-0.73	-1.97	0.04	-0.006
(III)	0.085	-0.008	2.08	-2.03	-0.47	0.05	0.07	-0.070

(I) = EU imposes trade regime which does not comply with WTO rules (in FSC US regime)

(II) = USA is allowed to retaliate by a decision of the WTO DSB (in FSC EU retaliates)

(III) = EU versus USA trade war

Source: Own simulations with a three-region CGE trade model.

The results can be summarized as follows (see table 5):

- (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”, as this scenario (I) leads to slight welfare losses (measured by CV, but also by nominal GDP), whereas the USA gains. Obviously, the EU population weighs health higher than simply more consumption of beef (which is implied in our CV



measure). Therefore, our simple welfare measure may be misleading. However, the EU can slightly improve their terms of trade. But trade between both partners slightly decreases.

- (c) The retaliation by the USA (scenario II) leads to welfare losses on both sides of the Atlantic (again, the tariff-imposer USA is “shooting in its foot”!). Bilateral trade volume declines, but the large USA can slightly improve its terms of trade.
- (d) The “mini” trade war between the USA and the EU leads to a slight welfare loss in the EU and a slight gain in the USA, which also can improve their terms of trade. However, trade between both partners decline by more than 0.1%.

Besides the problem of calculating the level of damage a country suffers from another not complying with WTO rules, a question – overlooked by the DS architects – concerns controlling. Once the amount of impairment is set by the Arbitrators in the WTO DS procedure, who controls ever whether the country (in our case the USA) which has the allowance to retaliate really only cashes in the amount decided by the WTO? In reality it is nearly impossible to split up the tariff revenues in “normal” and “retaliated” revenues. Further, who guarantees that the country collecting the retaliatory revenues distributes them to the companies who suffered the loss? These observations are true 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 previous theoretical analysis 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! As a consequence we will argue in favor of other retaliatory measures than tariffs in the concluding chapter.

## **5.2 The Bananas Case**

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.

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

The USA requested suspension of concessions (US\$ 520 million per year), the EC requested arbitration on this amount. In April 19, 1999 the DSB authorized the USA to 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 bedlinen, 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<sup>17</sup>. 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.

After agreeing about the revision of EC’s import regime for bananas on July 1, 2001, the USA suspended the trade sanctions (increased import tariffs on EC products), which were implemented over two years (from mid-1999 to mid-2001). The new system was scheduled to take effect on July 1, 2001. The EU will institute a system of licensing, based on historic reference periods from July 1, 2001. The EU will also initiate the necessary procedures to propose to the Council of Ministers an adjustment of the quantities in the various quotas, in order to expand access for Latin American bananas and to secure a market share for a specific quantity of bananas of ACP origin. The USA has pledged to work actively to secure acceptance of the EU’s request for the necessary WTO authorization. A tariff-only system is scheduled to take effect on January 1, 2006.

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)<sup>18</sup>. 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.

### ***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,

---

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

<sup>18</sup> 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).

GATS, TRIPS, etc.), on the other the calculation of the “hypothetical” exports are more difficult because the EU changed its regime continuously and at the time of determination the damage, nobody knew the new EU regime as a counterfactual base for calculations.

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)<sup>19</sup>.
- (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 it 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

---

<sup>19</sup> 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.

USA can only be negligible or nil since there is no actual trade and little prospect for potential trade in bananas between the USA and the EU (WTO, 1999a, at para 6.8).

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

The WTO requested the USA to provide calculations for four “counterfactuals” to the actual EC revised regime (in parenthesis the proposed figures provided by the US government): (1) a tariff-only regime, without tariff quotas, but including an ACP tariff preference (US\$ 326.9 million); (2) a tariff-quota system with license allocations based on the first-come, first-served method (US\$ 619.8 million); (3) the complete allocation of a tariff-quota system with country-specific allocations to all substantial and non-substantial ACP and non-ACP suppliers (US\$ 558.6 million); (4) the base US counterfactual, which assumed a continuation of a 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), 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 are 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, are 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*. The non-transparent way in which the Arbitrators dealt with this calculation exercise is near to the border of a scandal. In sharp contrast to the Hormones case (see table 4), where each commentator can simply reproduce the different steps which lead to the final amount of the level of nullification and impairment, the Arbitrators refused to document the steps on the way to the final result.

Since March 1999, the USA have taken countervailing measures worth US\$ 382.8 million (US\$ 191.4 over two years). 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%). The welfare implications of this "mini"-trade war between the EU and the USA, can be seen from model simulations with an own calibrated three-region CGE trade model (EU, USA, and the ROW) with seven sectors (see table 5). As in the Hormone case, three scenarios are simulated. (I) In the first scenario, the EU has in place its import regime for bananas which is protectionist according to WTO worth US\$ 191.4 million per year; in the model simulations, these measures are assumed to be taken in the agricultural sector (the Arbitrators of the WTO, however, calculated the level of damages for US firms on the assumption that they occurred only in the wholesale trade service sector for bananas!). (II) In the second scenario, the USA imposes trade sanctions according to the WTO DSB decisions worth the same amount; these measures concern a variety of EC product in other sectors (in our model in the sector light and other manufacturing). (III) The third scenario simulates the "mini" banana trade war between the EU and the USA imposing the measures of the scenarios (I) and (II) simultaneously,

which is also realistic, because over the past two years both trade policy measures were in place.

The results can be summarized as follows (see table 5):

- (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 of 0.005% of GDP. However, the EC gains slightly in terms-of-trade. Total trade between the partners is dampened. In a partial-equilibrium analysis of EC’s banana regime, Badinger-Breuss-Mahlberg (2001, p. 48) come to similar conclusions concerning the EU as a whole. The overall welfare loss over the period 1993-1998 amounted to Euro 68 million or 0.001% of GDP<sup>20</sup>.
- (c) The retaliation by the USA (scenario II) leads to welfare losses in the EU, but to slight gains in the USA.
- (d) The “mini” trade war between the USA and the EU leads to a welfare loss in the EU and a slight gain in the USA, which can improve their terms of trade. However, trade between both partners declines by 0.1% and 0.2% respectively.

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

---

<sup>20</sup> The special topic of the Badinger-Breuss-Mahlberg (2001) study, however, is not the estimation of the welfare impact of the EC import regime for bananas for the EU as a whole, but the estimation of the welfare implications for the individual EU countries. It turns out that countries with formerly free trade regimes for bananas are welfare losers (Austria, Finland, Germany and Sweden). Also the group of tariff imposing countries (Belgium-Luxembourg, the Netherlands, Denmark and Ireland) are losers. From the countries which are supplied by ACP countries, Italy is a winner and United Kingdom is a loser. Countries with own bananas production are partly winners (France and Greece) and partly losers (Portugal and Spain).

have promised to use its sanctions only as a temporary measure in accordance with Art. 22.1 DSU.

### 5.3 The FSC Case

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

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

As the implementation deadline was exceeded without a satisfactory change in the FSC regulations, on November 17, 2000 the EU has requested the WTO to authorize trade sanctions on the USA up to a maximum amount of US\$ 4.043 billion in the FSC trade dispute. This amount is based on the value of the subsidy granted by the USA under the FSC scheme according to the figures in the fiscal year 2001 US Budget proposal. The USA continue to provide a significant illegal export subsidy to more than half of total US exports, to the direct detriment of European companies. The US sectors that benefit the most from FSC are: chemical, pharmaceutical, mechanical machinery, electrical equipment and transport equipment; these are sectors where US and EC companies fiercely compete. The EU has also



submitted to the WTO an indicative list of those products that would be eligible for sanctions. The list of products avoids premature and unnecessary effects on trade flows while at the same time complying with WTO obligations. The EU argues in its “Background on latest developments in the FSC trade dispute” of November 17, 2000<sup>21</sup>, that the list includes chapters of the Common Customs Tariff where the EU has found that there are products that could be subjected to sanctions without negatively affecting the EU industry and consumers as the degree of dependency from the USA is low and there are alternative sources of supply available either within the EU or in third countries. If no imports stem from the USA, how would the EU then be able to collect the demanded tariff revenues amounting to around US\$ 4 billion per year? The latest Panel decision of August 20, 2001 (WTO, 2001) confirms the EU position that also the revised US FSC regulation (“FSC Repeal and Extraterritorial Income Exclusion Act of 2000”), set into force on November 15, 2000, is still not consistent with the SCM Agreement and the Agreement of Agriculture. Additionally, the legislation maintains in place the FSC regime at least until the year 2002. Until this new Panel report is accepted by all parties, the WTO DSB has to decide about the EU request for authorization of trade sanctions.

As there is not yet a concrete decision about the level of nullification and impairment, the following simulations with the own CGE model have only hypothetical character. For the time being, we assume that the WTO-illegal US exports subsidization under the FSC scheme amount to US\$ 4 billion per year. Further it is assumed (because we have not exact information which sectors are benefiting the most and to what degree) that all of our seven sectors equally benefit from this export stimulus. The EU then retaliates with the same amount with import tariffs levied on EC imports from the USA equally across all seven sectors. Last but not least a trade war scenario is simulated in which both measures on both sides of the Atlantic are implemented simultaneously. The results can be summarized as follows (see table 5):

- (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. In scenario (I), the isolated effects of the WTO-illegal FSC scheme is simulated. Export subsidies have the classical text book effects. Welfare and terms of trade decreases in the subsidizing country in support of exports. US exports to the EU increase by over 2%. Further more, exports must be financed out of the budget which leads to a decline in nominal GDP in the USA. In the EU, in contrast decreasing import

---

<sup>21</sup> The background information on the FSC case in view of the EU can be found on:

prices lead to additional imports, which improves consumer welfare and generates additional tax revenues (higher import tariff revenues) resulting in an increase nominal GDP in the EU. Terms of trade increase, as well as exports to the USA.

- (b) In scenario (II) the EU retaliates with the imposition of import tariffs worth US\$ 4 billion per year on all US products. As the exact product list is not yet known, we increase import tariffs equally across the border on all products. The EU trade sanctions lead to an increase in consumer welfare (CV increases by 0.03% of GDP), whereas the US consumers would lose. Terms of trade of the EU increase by one percentage point. Textbook-like, however, the bilateral trade flows would decline.
- (c) The trade war in the FSC case 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 terms of trade would increase, those of the US would decrease. The former export stimulating effect of the FSC scheme would be neutralized in this trade war and the exports of the EU would decrease by 0.5%.

In contrast to the Hormones and the Bananas cases, the calculation of the damage for EC firms should be simpler, because the US budget pay 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 would be of a considerable dimension and it would involve nearly all sectors of both economies with not easy appreciable consequences on welfare, allocation, efficiency, labor markets and change in sectoral competitiveness in both countries. The larger the retaliatory level at stake the plainer one sees the problems with the present practice of sanctions by the WTO-DS system. Without a detailed computable general equilibrium model (CGE) for both countries one is simply not able to evaluate all the economic interactions and consequences of such a trade war. 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. Therefore, the clear conclusion would be to change from a distorting retaliatory tariff practice to a clear-cut punishment transfer system from country to country.

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

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

Based on the present practice and the findings of this economic evaluation one can draw the following conclusions:

- (1) *Questionable system of compensation:* The present sanctions practice of the WTO DSB is to allow complainants to impose tariff measures. Theory and the empirical evidence (via simulations with CGE trade models) suggest that import tariffs 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 LDCs) countries 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 not implement such sanctions (e.g., Ecuador in its “cross-retaliation” case against the EU) either because they fear to lose the trade war or to lose the necessary aids from the large country (e.g., from the EU) or they hope for preferential treatment in debt negotiations in the Paris Club. Countermeasures in form of retaliatory tariffs are bad policy. They amount to “shooting oneself in the foot” (see Mavroidis, 2001, p. 46). Through countermeasures, at least a small and poor WTO member imposes an additional cost on society. Precisely because of the budgetary constraints, adoption of countermeasures is simply not an option for the poorer WTO members. The present system of compensation in the WTO illustrates the disadvantageous position of LDCs. Even “cross-retaliation” in the area of TRIPS, which may have seemed to more promising from the perspective of compliance-seeking developing countries, does not offer them the relief they hoped for, as can be seen in Ecuador’s experience in the Bananas dispute with the EU (see Bronckers, 2001, p. 61).
- (2) *From tariff to transfer sanctions:* Retaliatory measures via import tariffs have a whole series of incalculable and unpleasant impacts. The Hormones and Bananas 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<sup>22</sup>. 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 are irresponsible. Not only, they disadvantage small and poor WTO members but also they can not fully estimate the economic consequences. Furthermore, even if one accepts the estimated level of trade sanctions, presently, nobody is controlling whether the sanctioning country really collects exactly the amount it is allowed to, or more. Practically, this is an impossible game, as an administration cannot clearly differentiate which part of tariff revenues is retaliatory in nature and which is normal. Additionally, who controls the distribution of these retaliatory tariff revenues to the companies suffered a damage? Tariffs are therefore a 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 suffered the concrete loss. Whether transfers as retaliatory measures would also be covered by the present DSU legislation is an open question. Article 22.1 DSU never speaks about tariffs explicitly but only on “compensation and the suspension of concessions or other obligations”. Suspension of concessions implies, however, tariffs as the major part of concessions in former GATT rounds consists of tariff reductions. One could (newly!) interpret “other obligations” as the duty of countries not

---

<sup>22</sup> As Bronckers (2001, p. 62) mentions, various European companies, struck by US retaliatory measures, were

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.

(3) *The calculation of damages:* The present cases showed that the estimation of the correct level of the suspension of concessions “equal to the nullification or impairment “ is practically impossible. The calculation always involves the comparison between the actual situation with one hypothetical in which the trade measures would be WTO-legal. In both cases one has to estimate practically all parameters. A small change in the assumption of only one parameter results in considerable changes of the final result. As such calculations always have to be made under uncertainty one should at least do this exercise under two conditions: (a) The Arbitrators should make sensitivity analyses when fixing the level of impairment; (b) much more transparency is necessary (a good example is the Hormone case, a very bad example is the Bananas case).

Overall, the sanctions – as intended in Article 22.1 DSU they should only be temporary – had at least succeeded in the Bananas case. Here, the EU came to an agreement with the USA in implementing a new regime which satisfies both sides. In the Hormones case, the EU is still belated in abolishing the ban on imports of US beef. The matter is complicated insofar as (a) it is difficult to prove that hormone treated meat can cause cancer (the time of experience is too short), and (b) the European consumers simply refuse to eat hormone treated meat. If this were really true, then no ban on US meat would be necessary, given that the meat sold in European shops is labeled as hormone treated. In the FSC case, one must wait whether and when the new US administration is ready to give in. Taking into consideration other fields of international policy actions (Kyoto climate protocol, etc.) one must be skeptical that the Bush administration will give up soon the support to US exporters.

## **7. References**

- Badinger, Harald, Breuss, Fritz, Mahlberg, Bernhard, “*Welfare Implications of the EU’s Common Organization of the Market in Bananas for EU Member States*”, IEF Working Paper Nr. 38, Vienna, Mai 2001.
- Bagwell, Kyle, Staiger, Robert, W., “*An Economic Theory of GATT*”, The American Economic Theory, Vol. 89, No. 1, March 1999, 215-248.
- Bronckers, Marco, C.E.J., “*More Power to the WTO?*”, Journal of International Economic Law, 2001, 41-65.
- GATT, “*The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts*”, Geneva, 1994.
- Grossman, Gene, M., Helpman, Elhanan, “*Trade Wars and Trade Talks*”, Journal of Political Economy, Vol. 103, No. 4, August 1995, 675-708.
- Horn, Henrik, Mavroidis, Petros, C., Nordström, Hakan, “*Is the Use of the WTO Dispute Settlement System Biased?*”, CEPR Discussion Paper, No. 2340, London, December 1999.
- Horn, Henrik, Mavroidis, Petros, C., “*Economic and Legal Aspects of the Most Favoured Nation Clause*”, CEPR Discussion Paper, No. 2859, London, June 2001.
- Hungerford, Thomas, L., “*GATT: A cooperative equilibrium in a noncooperative trading regime?*”, Journal of International Economics, Vol. 31, 1991, 357-369.
- Jackson, John H., “*World trade and the law of GATT*”, Indianapolis, IN: Bobbs-Merrill, 1969.
- Johnson, Harry, G., “*Optimum Tariffs and Retaliation*”, The Review of Economic Studies, Vol. XXI (2), No. 55, 1953-54, 142-153; revised version in: Harry, G. Johnson, International Trade and Economic Growth: Studies in Pure Theory, George Allen & Unwin Ltd., London 1958, 31-55.
- Kennan, John, Riezman, Raymond, “*Do Big Countries Win Tariff Wars?*”, International Economic Review, Vol. 29, No. 1, February 1988, 81-85.
- Maggi, Giovanni, “*The Role of Multilateral Institutions in International Trade Cooperation*”, The American Economic Review, Vol. 89, No. 1, March 1999, 190-214.
- Mavroidis, Petros, C., “*Remedies in the WTO Legal System: Between a Rock and a Hard Place*”, in: M. Matsushita, P.C. Mavroides, T.J. Schonbaum (Eds.): The WTO Law and Practice, London, 2001.
- McMillan, John, “*Game Theory in International Economics*”, Harwood Academic Publishers, Chur-London-Paris-New York, 1986.
- Polinsky, Mitchell, Shavell, Steven, “*The Economic Theory of Public Enforcement of Law*”, Journal of Economic Literature, Vol. XXXVIII, No. 1, March 2000, 45-76.

- Rodrik, Dani, “*Political Economy of Trade Policy*”, in: Gene, M. Grossman, Kenneth Rogoff (Eds.): *Handbook of International Economics*, Vol. III, Elsevier, Amsterdam-Lausanne-New York-Oxford, Shannon-Tokyo, 1995, 1457-1494.
- Shoven, John, B., Whalley, John, “*Applying General Equilibrium*”, Cambridge University Press, Cambridge-New York, 1992.
- Spagnolo, Giancarlo, “*Issue Linkage, Credible Delegation, and Policy Cooperation*”, CEPR Discussion Paper, No. 2778, London, May 2001.
- Staiger, Robert W., “*International Rules and Institutions for Trade Policy*”, in: Gene, M. Grossman, Kenneth Rogoff (Eds.): *Handbook of International Economics*, Vol. III, Elsevier, Amsterdam-Lausanne-New York-Oxford, Shannon-Tokyo, 1995, 1495-1551.
- Vranes, Erich, “*Principles and Emerging Problems of WTO Cross Retaliation*”, *Europäische Zeitschrift für Wirtschaftsrecht (EuZW)*, Heft 1/2000, 10-15.
- Whalley, John, “*Trade Liberalization among Major World Trading Areas*”, The MIT Press, Cambridge, Massachusetts, London, England, 1985.
- 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, 9 April 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, 12 July 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, 12 July 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, 24 March 2000.
- 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, 20 August 2001.