# The WTO Dispute Settlement System: A First Assessment from an Economic Perspective

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We explore the incentives countries face in trade litigation within the new WTO dispute settlement system. Our analysis yields a number of interesting predictions. First, because sanctions are ruled out during the litigation process, the dispute settlement system does not preclude all new trade restrictions. However, the agenda-setting capacity of the complainant, including its right to force a decision, make trade restrictions less attractive than under the WTO's predecessor, GATT. Second, the system's appellate review provides the losing defendant with strong incentives to delay negative findings, and both parties with a possibility to signal their determinacy in fighting the case. Third, a relatively weak implementation procedure potentially reinforces incentives to violate WTO trade rules. Fourth, bilateral settlements are more likely at an early stage in the process and are biased toward the expected outcome of the formal dispute settlement procedure. Empirical evidence based on a first dataset of cases at an advanced stage of the litigation process provides qualitative support for our claims.

## 1. Introduction

> *Don't let the European Union make a game of the WTO system*[1]

The World Trade Organization (WTO) celebrated its fifth anniversary on January 1, 2000. This was overshadowed by the failure of the Third

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1. *Washington Post*, December 1998. This and other advertisements ("If it's going to have any teeth, the World Trade Organization has to cut them on beef and bananas.") refer to the two prominent agricultural conflicts (DS16/27 and DS26/48, see Table C.1) between the United States and the European Union, and have appeared in major U.S. newspapers in 1998. In both cases, the WTO decided in favor of the United States (the complainant) and requested the European Union (the defendant) to change its practice within a period of 15 months. The European Union failed to implement the recommendations of the dispute settlement system, and the United States subsequently got permission to levy retaliation tariffs on EU products.

WTO Ministerial Conference in Seattle and two big—though not necessarily representative—agricultural trade disputes between the United States and the European union, which have caught most of the public's attention concerning the WTO in recent months. Unfortunately one of its most important features, the new dispute settlement system, has not attracted the attention it deserves. Although the well-known "banana" and "hormones" cases have indeed uncovered potential weaknesses in the litigation mechanism, a substantial number of disputes have gone through the process successfully, but largely unnoticed by both the public and the economic profession. Our article attempts a first systematic description of the mechanism from an economic perspective. We analyze the WTO dispute settlement system as a game and confront the predictions of the theoretical model with the empirical evidence from its first five years.

The WTO's predecessor, GATT (General Agreement on Tariffs and Trade), was successful in reducing tariffs, but suffered from increasing problems with nontariff restrictions and from a weak and intransparent mechanism to deal with trade disputes. As a consequence, the new WTO established a mandatory and unified dispute settlement system with much broader jurisdiction. During its first five years a large number of cases made this institution by far the most active part of the new international trade organization. WTO and GATT dispute settlement systems have been studied by political scientists and legal experts,[2] but we are not aware of any other economic explanation of the parties' incentives and strategies during the dispute settlement process. Our contribution tries to fill this gap by providing a more formal economic analysis of the mechanism.

The WTO's trade litigation procedures differ not only from dispute handling within the old GATT, but in fact from any previous dispute settlement mechanisms at an international level. Any member country that feels negatively affected by another country's trade measure can bring a case before the dispute settlement system and is granted agenda-setting capacity for a large part of the dispute. Unless a bilateral settlement is reached between the countries involved, the case is decided by a panel established by the Dispute Settlement Body (DSB). The panel's verdict can subsequently be appealed by either country. If the report is in favor of the complainant, the defendant country is given

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2. See, for example, Croley and Jackson (1996), Vermulst and Driessen (1995), and Palmeter and Mavroidis (1998). A more general perspective on trade legalism is taken by Shell (1995). For a statistical analysis of GATT disputes see Hudec, Kennedy, and Sgarbossa (1993). While focusing on legal aspects, Jackson (1998) provides interesting information on motives and strategies of litigating parties. Petersmann (1997) contains a detailed analysis of the WTO dispute settlement system and its predecessors from a predominantly legal perspective. This book also comprises a large number of illustrating examples, predominantly under GATT.

a limited period to implement the panel's or appellate body's recommendations. In case of the defendant's noncompliance after the granted implementation period, the complainant has a right to ask for compensatory trade concessions. An important difference to dispute settlement under GATT is the elimination of a (factual) unanimity rule. As a consequence, the WTO dispute settlement system prevents single members from blocking the adoption of the final and binding decision.

The new rules seem effective in practice. Already a casual inspection of (nearly) completed cases offers some striking empirical regularities. The first is the large number of cases that have been brought forward for formal dispute settlement: 185 complaints in five years contrasted with fewer than 300 cases in GATT's 47-year history. The large number of cases put forward could be a consequence of the system's inability to prevent trade restrictions or nuisance suits, but could also represent a higher confidence of negatively affected countries in an improved mechanism. The second observation is the apparent popularity of the appellate review. In only four cases was the panel report the last instance of the litigation, whereas 24 panel reports were subsequently appealed.[3] The high proportion of appeals does not seem consistent with the appellate review being an additional legal safeguard only. A third observation, which deserves further analysis, is the mixed success of the system's implementation mechanism. Whether noncompliance is an inherent danger of the system's structure, as the two big agricultural disputes may suggest, is yet an open question. It is clear, however, that a successful implementation stage feeds back into a more powerful procedure. A fourth and last observation is the relatively high ratio of bilateral settlements prior to a panel decision.

Our article attempts to cast some light on these issues. In particular, it aims to answer the following questions:

1. Can the WTO dispute settlement system preclude trade restrictions and nuisance suits?
2. What are the reasons and incentives of the (losing) country to appeal a panel finding? Does the appellate review in practice really play a strictly legal role?
3. How well can WTO rulings and recommendations be enforced given the incentives of the litigants?
4. When are bilateral settlements more likely, and what form might they take? Should they be encouraged by the WTO as they currently are, or rather not?

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3. These numbers do not include cases for which the granted period to appear had not elapsed by December 31, 1999. Most cases, however, are still at a preliminary stage of the litigation process.

The importance of strategic interaction between the countries during litigation can be captured by a dynamic game with a succession of sequential moves of the involved players. Time is an important determinant of both parties' payoffs, because rents and costs accrue during the whole litigation process. In the course of the procedure, the appearance of new information and joining third parties, moreover, can change the outcome of the game. Modeling the multistage setting and the rather complicated structure of the system poses a number of difficult questions. The focus of our article clearly lies in finding an appropriate way to map the system into a tractable dynamic game that preserves the most important features, rather than in applying sophisticated game theoretic methods. Although we take an economist's perspective, legal and political aspects are taken into account via their impact on the parties' payoff structure.

Civil suits and international disputes share a number of common features, but differ considerably in other respects.[4] As the most important difference, the payoffs of parties in international litigation accrue predominantly in a nonpecuniary way in the form of political rents and as reputation effects. In most instances, therefore, the issue is not a zero-sum game. Due to the limited number of countries in the organization, moreover, the players' characteristics are supposedly well known. Imperfect information within the dispute settlement system is therefore only of secondary importance.

The article is structured as follows. Section 2 describes the new dispute settlement mechanism in more detail and highlights its most important differences compared to GATT. Section 3 introduces the structure of the game. The core of the article, Section 4, analyses the outcomes of the game. The model's predictions at different stages of the litigation process are compared with a preliminary dataset of completed or nearly completed cases. Section 5 provides a summary of the most important findings and concludes.

## 2. Dispute Settlement Under GATT and WTO

The WTO dispute settlement mechanism involves a number of stages, the most important of which are illustrated in Figure 1, and by a typical completed case—a complaint by Venezuela against the United States about standards for gasoline—in Appendix B.[5] Obviously the reason for the procedure, and therefore the first stage of the litigation procedure, is a trade-related measure of country D (the future defendant), which

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4. The existing literature on the economic analysis of legal disputes is predominantly concerned with civil suits. An excellent review of this literature can be found in Cooter and Rubinfeld (1989).

5. A comprehensive description of the dispute settlement system and a wealth of additional information, including panel and appellate review reports, can be found in WTO (1995) and on the WTO's website (www.wto.org/wto/dispute).

country D takes action (trade restriction, etc)

→ *bilateral settlement*

country C notifies WTO

→ *bilateral settlement*

country C requests panel

*panel established*

→ *bilateral settlement*

interim report

→ *bilateral settlement*

panel report

*end of panel stage*

appellate review

panel report adopted      appellate body report adopted

*implementation stage*                    *(only if report is in favour of country C)*

country D does not implement

negotiations on compensations

→ *compensations (temp.)*

authorizations of retaliation measures

→ *retaliation (temp.)*
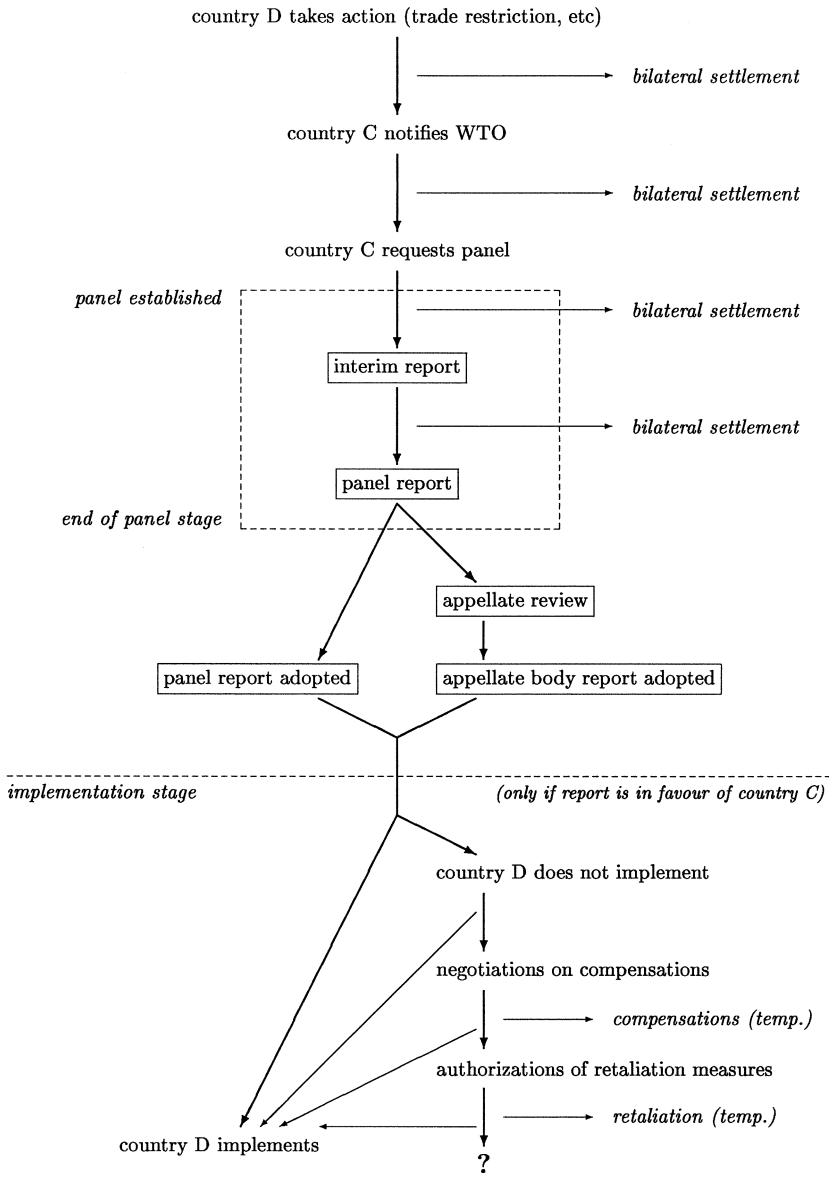
country D implements              ?

Figure 1. Stages of the new WTO dispute settlement system.

seemingly violates WTO law and nullifies or impairs the benefit of another country C (the future complainant). While most cases within the WTO dispute settlement system have dealt with preexisting measures, this first step must not be neglected, should the role of the dispute settlement be analyzed for future cases. Ideally the WTO

should prevent countries from taking measures incompatible with WTO law in the first place.

If no bilateral settlement between the two parties can be reached outside WTO procedures, the complainant country C can notify the WTO that it is asking for consultations under the dispute settlement system. This step brings the case to public attention and might attract other countries having similar problems with country D. Countries with a genuine interest in the case can be formally included as third parties in the dispute. Should no agreement be reached after 60 days, the complainant can request the establishment of a panel, which will usually be granted by the WTO's DSB after at most 30 days.

The panel stage, which under normal conditions should not exceed six months, follows a number of intermediate steps and involves both parties. In a careful fact-finding process, the positions of both countries are reviewed. An important step during the panel stage is the interim report, which includes all relevant panel findings and can be viewed as a final draft of the panel's verdict. Revealing the position the panel will take on this particular case, it is thus an important source of information for both parties. The interim report should remain confidential to the parties involved[6] and give them a last opportunity to settle their dispute bilaterally. If no bilateral settlement can be reached, the final panel report, which includes recommendations for implementation, is circulated among all WTO members.

As a novel feature of trade litigation, the WTO dispute settlement system provides an appellate review by a standing appellate body composed of seven independent legal experts. This second—and last—step should provide an additional safeguard against legally wrong panel's decisions. Both involved parties can appeal against legal or procedural aspects of the panel's decision. The introduction of the possibility of an appellate review as a second safeguard is considered to be one of the main new features of the system compared to GATT proceedings. The appellate body has a strictly legal function, such that substantive issues—in principle—cannot be raised during this stage.[7]

Should the binding decision of either the panel or the appellate review be in favor of the complainant, the defendant is given a "reasonable period" (typically not to exceed 15 months) of time to bring the respective trade regulation into conformity with WTO law. In case of

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6. Often, however, this principle has been violated in the past, notably by the winner in bigger cases, most recently by the European Union in the Foreign Sales Corporations (FSC) dispute with the United States (DS108).

7. However, limiting the permissible subject matter of the appeal is presumably difficult. Petersmann (1997:190) writes: "*Experience with domestic and international appellate review proceedings confirms that distinguishing law from fact, and defining the limits of legal arguments, are notoriously difficult.*"

disagreement the period is determined by an independent arbitrator. If the defendant does not conform with the panel's recommendations, compensatory measures can be taken by the complainant. In a first step, the complainant can force the defendant to enter a bargaining process regarding compensatory trade concessions. If the parties do not come to an agreement within 20 days, the complainant is granted the right to take countervailing measures, which have to satisfy certain conditions. Among others, the volume of the retaliation measures must not exceed the complainant's incurred damage. Although both compensation and retaliation measures are supposed to be temporary, it is unclear what happens if the defendant refuses to implement the recommendations of the panel despite countervailing measures.

Between any of these formal stages, bilateral negotiations can take place. Failure to reach a bilateral agreement is a necessary prerequisite for the next step. It usually suffices to notify the WTO about a successful mutual agreement. The outcomes of bilateral settlements are not monitored by the WTO, and their contents are usually not disclosed.

The major differences between the WTO structure and dispute settlement under GATT can be summarized as follows: First, the WTO offers a unified dispute settlement system for trade disputes under all WTO agreements, whereas GATT comprised at least eight different structures for dealing with trade disputes, depending on the nature of the trade restriction. This feature of GATT induced parties to use forum shopping in order to find the most favorable environment. Second, the complainant now has a *right* to have a panel process initiated. Unlike under GATT's factual unanimity rule, there is no way for the defendant to block formal litigation at this stage. In fact, within some limits, the complainant is granted agenda-setting power during the whole litigation process. Third, both parties can appeal against the panel decision. Fourth, the adoption of the final decision (either the panel or the appellate body report) within the WTO dispute settlement system can no longer be vetoed by the losing defendant, as under the old GATT. Finally, the implementation phase has been given more structure. If the losing country does not conform with the panel's recommendations, the complainant has the right to ask for compensation or to take countervailing measures.

## 3. The Theoretical Model

Our goal is to arrive at a tractable model of the WTO dispute settlement procedure that captures the most important features of the system. The rest of the litigation process is summarized in an appropriate way. We first introduce the participating players and the main stages of the game. The players' payoff structures and the underlying information set are discussed next.

## 3.1 Players

The WTO dispute settlement system has two genuine players: The defendant, D, is the country which has taken an action (trade restriction) and which is subsequently accused of violating WTO law by the complainant, C, which files the suit. Both countries are represented by their governments, whose interests are not necessarily identical to those of their population. Throughout the analysis, we assume risk-neutral players and therefore linear utility.[8]

Unlike many private litigation processes, the WTO dispute settlement mechanism allows third parties to participate in the process. Moreover, new information might turn up during the litigation. In our analysis, any new relevant information and the appearance of additional countries are summarized in a change in either the litigation costs or in the probability of a certain outcome of both the panel and the appeal decision.

## 3.2 Stages of the Game and Timing of Actions

Two kinds of stages are distinguished: First, there are well-defined stages during which one of the two countries or WTO makes a move. Second, there are some intermediate stages in which bargaining between the two countries can take place. The main stages in the former category are illustrated in Figure 2. In a first step (1) the *defendant* introduces a trade-related measure. This can also mean that a preexisting—and previously undisputed—measure can suddenly fall under scrutiny of other countries, notably after a change in WTO law. The next two steps—notification of WTO (2) and panel request (3)—are taken by the complainant and initiate the official WTO procedure. The most important step during the panel phase clearly is the interim report [move (4) by the WTO]. This is the first time during the process when the involved parties know the position of the panel. Both parties can appeal against the panel decision (5). The succession of moves (or simultaneous moves) is not specified here. The appellate review (6) is the final decision by the WTO. The findings of the interim report can be reconfirmed or revised. To simplify matters we summarize the implementation stage as a single step (7). Between any of the above stages, bilateral negotiations can take place. Failure to reach a bilateral agreement is a necessary prerequisite for the next step, and a successful bilateral settlement ends the game at any stage.

We assume that the decisions of the WTO dispute settlement system are unequivocal, either in favor of the defendant or in favor of the

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8. By postulating linear utility, computations of expected payoffs are kept transparent, even when the dispute stretches over several periods. Moreover, we do not have to specify any distributional assumptions about random components of the payoff structure.

(1) — defendant
takes action

yes / no

(2) — complainant
notifies WTO

random
draws
$\Rightarrow \pi; (\mu, \nu)$

(3) — complainant
requests panel

(4) — WTO
interim report

complainant
$[\pi]$

defendant
$[1 - \pi]$

(4a) — both parties
bilat. settl.
(or panel dec.)

no / no

(5) — either party
appeals

no / yes     no / yes

(6) — WTO
appellate review
decision

compl.
$[1 - \mu]$

def.
$[\mu]$

def.
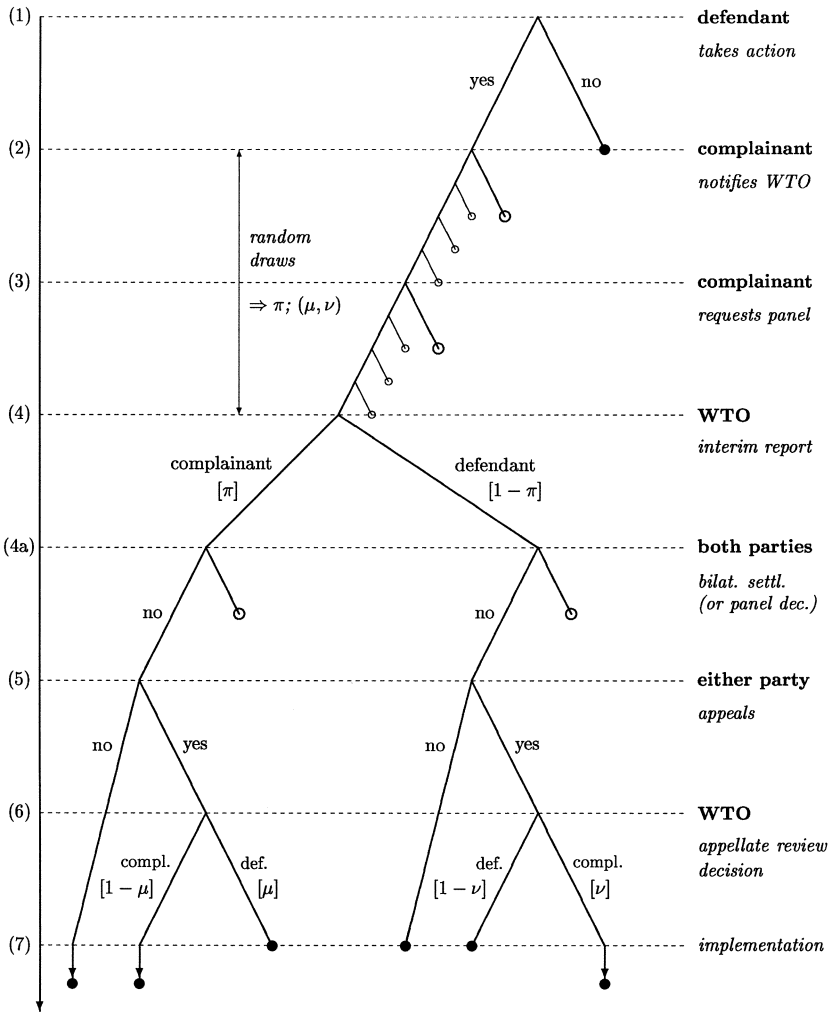$[1 - \nu]$

compl.
$[\nu]$

(7) — implementation

Figure 2. WTO dispute settlement system. Game tree (without implementation stage). Filled dots denote final nodes for which (expected) payoffs are known, circles denote final nodes corresponding to bilateral settlements, for which payoffs are not a priori known. Probabilities are given in square brackets.

complainant. Precluding the possibility of "intermediate" decisions, we thus merely have to state the resulting payoffs in either case.

### 3.3 Payoff Structure

We distinguish three categories of relevant payoff components (as summarized in Table 1): directly trade-related gains and losses, reputation gains and losses, and litigation costs.

Table 1. Payoff Elements for Both Players and Probabilities of WTO Decisions

| Description | Parameter |
|---|---|
| *Trade related gains/losses* | |
| Loss of complainant (rate, per year) | $l \geq 0$ |
| Continuation loss of complainant | $\tilde{L} \geq 0$ |
| Gain of defendant (rate, per year) | $g$ |
| Continuation gain of defendant | $\tilde{G}$ |
| Compensation loss, defendant (per year) | $p^D$ |
| *Reputation gains/losses* | |
| Loss of losing panel | $R^C_{\text{lose}}, R^D_{\text{lose}}$ |
| Gain from winning panel | $R^C_{\text{win}}, R^D_{\text{win}}$ |
| Gain from undergoing appellate review | $R^C_{\text{app}}, R^D_{\text{app}}$ |
| Loss of not conforming | $R^D_{\text{impl}}[t]$ |
| *Litigation costs* | |
| Direct costs (lawyers, etc.) | $K^C, K^D$ |
| *Probabilities* | |
| Panel in favour of complainant | $\pi$ |
| Revision by appellate review (panel = complainant) | $\mu$ |
| Revision by appellate review (panel = defendant) | $\nu$ |

*Trade related gains and losses* may represent welfare gains and losses to a country, but very often are rents and costs accruing to certain interest groups that translate directly into an implicit political support function. For simplicity, it is assumed that trade-related payoffs are proportional to the time the trade measure is in action. Note that, unlike in most civil suits, gains and losses are not symmetric. The game is therefore not a zero-sum game, even in the absence of reputation costs. If the gains accrue to powerful lobby groups, for example, a trade restriction might well lead to a gain for the defendant in political support which exceeds the complainant's loss.[9] To capture the impact of the duration of the litigation on payoffs, we make a distinction between rents *during* the process and continuation rents *after* the conclusion of the litigation process. During the dispute settlement procedure, the benefit rate for the defendant is denoted by $g$, and the loss rate for the complainant by $l$.[10] To simplify the analysis, we refrain from discounting benefits and losses during the length of the dispute. Continuation rents and losses, denoted by $\tilde{G}$ and $\tilde{L}$, respectively, accrue after completion of the litigation process. We assume that they are finite due to discount-

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9. The U.S. Treasury Department, for example, estimates that the current U.S. FSC regime (DS108, see Table C.1) generates $2–$3 billion in permanent tax savings to U.S. exporters annually. Despite these revenue losses, the U.S. government strongly defends this measure, backed by a powerful lobby of exporters.

10. For a period of time $t$ (given as a fraction of one year), trade-related gains and losses are consequently $gt$ and $lt$.

ing or due to the fact that new technologies or other changing circumstances might render a previously beneficial or harmful trade restriction irrelevant. A last trade-related payoff is the loss $p^D$ (given as a rate) incurred by a noncomplying defendant via the complainant's retaliation policies during the implementation stage.

Reputation gains and losses are assumed to occur at certain stages of the litigation process. The importance of these payoff elements is emphasized especially by political and legal scientists [see, e.g., Jackson (1998)]. Reputation payoffs depend on the nature and size of the dispute, as well as on a country's size and political structure (i.e., the importance of interest groups, reelection procedures). With one exception they are modeled here as one-time gains and costs: Reputation gains/losses for the complainant (defendant) in case of a positive/negative outcome of the process are denoted by $R^C_{\text{win}}$ ($R^D_{\text{win}}$) and $R^C_{\text{lose}}$ ($R^D_{\text{lose}}$), respectively.[11] For simplicity, we assume that they only occur during the panel stage and are therefore adjusted for the probability that the subsequent appellate review yields a different outcome. By undergoing the appellate review stage after a negative panel finding, the losing government can signal its determinacy to act in the interest of the involved domestic groups, realizing a reputation gain $R^C_{\text{app}}$ ($R^D_{\text{app}}$). Note that for the defendant country, the appellate stage is the first and only stage in which it can actively influence the process.[12] Reputation costs of noncompliance with the DSB's findings are assumed to increase with time and are denoted by $R^D_{\text{impl}}[t]$ [i.e., $d(R^D_{\text{impl}}[t])/dt \geq 0$]. The fact that the United States, but also other countries, complied even in the absence of explicit implementation procedures under GATT in a number of cases provides some support for the existence of these reputation costs.[13] Their structure will depend on the nature of the conflict.

Litigation costs—that is, the legal and organizational costs of entering the dispute settlement system—are denoted by $K^C$ ($K^D$). For

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11. The eagerness of countries to advertise victory or to explain a defeat is obvious from various media reports. In a press statement, the European Union writes: "Until now, there have been only two rulings that have found that certain EU measures are incompatible with WTO provisions. These are the Hormones and Banana cases. It should be remembered that these cases have a long history and involve other considerations than trade, such as public health and development assistance." (EU information on the web (October 98)). Concerning the lost U.S. film case (DS44, see Table C.1), the *New York Law Journal* (February 26, 1998) cites the dean of Brooklyn Law School: "The loss was small in comparison to other victories the U.S. has been setting so far."

12. Especially in the European Union and the United States, the actions of the governments are closely monitored by the involved interest groups. As the headline of its press release, Greenpeace stated: "Greenpeace applauds EU appeal against WTO beef-hormone ruling," Brussels (September 1997).

13. Jackson (1998:170) argues that "even the most powerful trading entities in the world find it difficult diplomatically to ignore the results of the dispute settlement process, although in some sense, they could get away with it."

simplicity, we assume that litigation costs only matter for the panel stage. They should be interpreted as net additional costs of formal litigation over mutual agreement. The entrance of third parties into the dispute can thus affect the process costs directly (sharing of legal fees) or indirectly (higher coordination costs for cooperating countries in bilateral settlements).

### 3.4 Information Set and Probability Structure

The analysis assumes a game under uncertainty in which the outcomes of the settlement procedure are not known in advance. The probability of the WTO (panel) deciding in favor of the complainant is denoted by $\pi$. The revision probabilities of a potential appellate review are given by $\mu$ (the probability of appellate review in favor of the defendant after a panel report in favor of the complainant) and $\nu$ (the probability of appellate review in favor of the complainant after a panel report in favor of the defendant). An additional restriction is imposed on the probabilities $\mu$ and $\nu$, which allows us to abstract from revision probabilities later in the analysis. We require that the probability $\pi$ that the panel rules in favor of the complainant equals the overall probability of success for the complainant:[14]

$$\pi = \pi(1 - \mu) + (1 - \pi)\nu. \tag{1}$$

We assume symmetric information about all rents. In the context of the WTO dispute settlement, it can be expected that gains and losses from trade restrictions are public knowledge. The same is true, possibly to a lesser extent, for litigation costs and reputation gains and losses. Under symmetric/complete information, both players have identical beliefs at each stage of the game.

Probabilities and payoff elements are not restricted to remain constant during the game. Apart from WTO's decisions, random draws between notification and the interim report may change the information and cost structure of the game. The probability of a certain outcome is itself random. However, we assume that the best predictor of each payoff component $X$ is always the current value of $X$,[15] therefore $E(t)X(t + s) = X(t), \forall s \geq 0$. Random changes are assumed to be un-

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14. As a numerical example, consider a situation in which the complainant has a high probability $\pi = 0.9$ to win. For $\mu = 0.1$, Equation (1) dictates that $\nu = 0.9$, that is, that the probability of a revision in favor of the complainant after a negative panel finding is rather high. For $\pi = 0$, which corresponds to an empty threat of the complainant, $\nu = 0$ and $\mu$ can take any value. Similarly for $\pi = 1$, which corresponds to a clear violation of WTO law, $\mu = 0$ and $\nu$ is unspecified.

15. Note that probabilities (but not payoffs) are restricted to lie in the interval $[0, 1]$. Consequently there is a probability mass one at both $\pi = 1$ and $\pi = 0$. This means that once a case is clear, it will stay so forever with probability one.

correlated. Consequently we do not have to specify the probability distribution of the payoff components (or of probabilities) in a risk-neutral setting with linear preferences.

The recent Foreign Sales Corporations case (FSC, DS108) between the European Union and the United States provides a nice illustration for time-dependent payoffs. As will be predicted by our theoretical model below, the United States appealed against the negative rulings of the panel. Shortly afterwards it withdrew the appeal, conditional on its right to file a new notice of appeal later. Most probably the United States, hosting the Third WTO Ministerial Conference in Seattle, did not want to be seen as a noncomplying country. After the conference, when public attention was beginning to fade away, the United States did indeed renew its appeal. Apparently the United States experienced a temporary change in its reputation costs.

## 4. Theoretical Predictions and Empirical Evidence

The game tree is drawn in its extensive form in Figure 2. Taking into account the limited information available on the implementation stage, a simplified treatment will be proposed below. The model is solved backwards to obtain subgame perfect equilibria. Following the solution path, we present the predictions for the implementation stage first, and proceed with an analysis of the appeal stage. The complainant's optimal strategy before the panel and its filing decision are considered next. Finally, we analyze the future defendant's decision to introduce a trade measure. A summary of predicted subgame perfect equilibria and the number of cases corresponding to them can also be found in Table 2.

In the first part of this section, bilateral settlements are ignored, that is, the results are stated as if there was no scope for mutual agreements. A first reason is the very limited information available about the nature of bilateral agreements. It is generally unknown whether a bilateral settlement involves a reduction of the disputed trade measure or compensatory trade restrictions by the complainant. Second, compensation payments—an important ingredient in civil suits—hardly exist between litigating countries. The highly nonpecuniary nature of most payoff components makes it difficult to compare the "cooperative value" of a settlement with the "noncooperative value" of pursuing the dispute. The possibility of bilateral settlements is therefore analyzed separately in the second part of this section.

Each prediction from our model is illustrated with some empirical evidence from WTO dispute settlement complaints filed during the first five years. This analysis rests on a preliminary database prepared by the authors which comprises relevant information on all complaints filed during this five-year period. Unfortunately, only a fraction of all filed suits have been concluded so far, and the vast majority are still at a preliminary stage in the litigation process. Nonetheless, the existing evidence should facilitate an assessment of the predictive power and

Table 2. Subgame Perfect Equilibria of the WTO Dispute Settlement Game

| Stage | 1 | 2 | 3 | 4 | 4a | 5 | | 6 | Cases |
|---|---|---|---|---|---|---|---|---|---|
| Move by | D | C | C | WTO Intermediate | Panel | D | C | WTO | |
| I | — | — | — | — | | — | — | — | NA |
| II | Action | — | — | — | | — | — | — | NA |
| III | Action | Notification | Panel | C | | Appeal | — | C | 19* |
| IV | Action | Notification | Panel | C | | Appeal | — | D | 2 |
| V | Action | Notification | Panel | D | | — | Appeal | D | 1 |
| VI | Action | Notification | Panel | D | | — | Appeal | C | 0 |
| Other | | | | | | | | | 6 |
| BS1 | Action | BS | — | — | | — | — | — | NA |
| BS2 | Action | Notification | BS | — | | — | — | — | 24 |
| BS3 | Action | Notification | Panel | BS | | — | — | — | 4 |
| BS4 | Action | Notification | Panel | ? | BS | — | — | — | 1 |

The upper part of the table lists equilibria without an intermediate bilateral settlement and without major random changes to the payoff structure during litigation (* includes two cases in which an appellate review was requested by the winning country). The lower part lists cases, in which a bilateral settlement (BS) can be a possible equilibrium outcome. Only clear empirical cases have been classified. BS = bilateral settlement; NA = no information available.

potential shortcomings of our theoretical model. For easy reference, all cases mentioned explicitly in this article are numbered by their official WTO label, and are listed in Appendix C (Table C.1).

## 4.1 The Implementation Stage

After a negative panel or appellate review ruling, the losing defendant is granted a "reasonable implementation period," $\tau$. Although negotiations about compensatory concessions can be requested and retaliation measures can be taken in case of the defendant's noncompliance, the role of the complainant is rather passive. Its only choice variable is thus the time $\tilde{\tau} \geq \tau$ after which it can ask for retaliation.[16]

The optimal strategies of both players during the implementation stage can be summarized in Prediction 1.

*Prediction 1* (implementation). The defendant conforms with WTO rulings, if and only if

$$g - p^D I_{[t \geq \tilde{\tau}]} - \frac{d\left(R^D_{\text{impl}}[t]\right)}{dt} \leq 0, \tag{2}$$

where $I_{[t \geq \tilde{\tau}]}$ is the indicator function. Consequently,

- The optimal strategy of the complainant is to request compensation or retaliation immediately after the completion of the granted implementation period, thus $\tilde{\tau} = \tau$.
- Given the expected strategy of the complainant, the three possible implementation dates are as follows:
  — At the beginning of the implementation period ($t = 0$), if the reputation costs for nonconforming with WTO law are greater than the trade gains.
  — At the end of the granted implementation period ($t = \tau$), if the impact of compensatory measures is sufficiently large (i.e., if $p^D \geq g - d(R^D_{\text{impl}}[t])/dt|_{t=\tau}$).
  — At a time $\tilde{t} \leq \infty$ strictly greater than $\tau$ for which $d(R^D_{\text{impl}}[t])/dt|_{t=\tilde{t}} = g - p^D$).

*Proof.*    Note that instantaneous trade-related gains $g$ and losses due to retaliation $p^D$ are constant, while reputation costs of noncompliance are assumed to be increasing, that is, $d(R^D_{\text{impl}}[t])/dt \geq 0$.[17]

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16. We view compensatory concessions and retaliations as a combined means to punish a nonconforming defendant.

17. For linear reputation costs, for example, $R^D_{\text{impl}}[t] = \rho t$, the three possible implementation equilibria are $t^*_{\text{impl}} = 0$, $t^*_{\text{impl}} = \tau$, and $t^*_{\text{impl}} = \infty$. For exponential reputation costs the defendant always implements after a finite time period: A nonconforming defendant is stigmatized quickly enough to prevent an infinite delay of implementation.

Even if compensation payments are granted by the defendant or if retaliation measures offset part of the incurred loss of the defendant's trade restriction, the complainant is unanimously better off by a direct implementation of the panel's recommendation. Recall that the trade value of the retaliation measures must not exceed the trade value of incurred losses and the complainant gets no retroactive remedy. Taking into account the fact that the defendant has a strong incentive to delay implementation, the optimal strategy of the complainant country is to request compensation or retaliation as soon as possible.

By the end of 1999, our database contained 11 cases for which information on the implementation status is available. The remaining cases with a final report in favor of the complainant are still within the "reasonable implementation period" granted by the system. While the number of cases is too small to draw reliable conclusions, the clustering of implementation periods, as predicted by our model, is obvious. We can distinguish three different patterns of implementation behavior so far. Two cases ended with an immediate adoption of the panel's or appellate review's recommendations. Both involved relatively minor complaints against the United States in which the direct gains for U.S. interest groups can be presumed to be small relative to reputation losses in delaying implementation (DS24 and DS33).[18]

In seven cases (involving seven different defendants),[19] the losing defendant implemented the panel's finding shortly after the "reasonable implementation period" had elapsed, in most cases after 15 months. Once a reasonable period has been specified (either in the final report or by an arbitrator), none of the countries has an incentive to conform before, and the prospect of retaliation measures may have triggered implementation. The affected trade volumes in the seven disputes seem to be in an intermediate range.

In two major agricultural trade disputes between the United States as a complainant and the European Union as the defendant (DS16/27 and DS26/48), the panel's recommendations were not (fully) implemented even after the period determined by the arbitrator. In both cases the

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18. In the latter case, the United States conformed with the panel's recommendations even before the final appellate review report was adopted. The appeal was actually asked by the complainant to get clarifications on legal, but not substantive issues. (See also the section below on appellate review.)

19. The cases are DS2/4 (defendant United States), DS8/10/11 (Japan), DS31 (Canada), DS50 (India), DS54/55/59/64 (Indonesia), DS56 (Argentina), and DS69 European Union. Complaint DS2/4 is also illustrated in Appendix C. The implementation of four further rulings (DS18, DS46, DS70, and DS58) is scheduled to be evaluated by the original panel because there is considerable disagreement between the litigants about the implementation status after the implementation period had elapsed.

United States asked for, and was granted, compensatory measures immediately after the given implementation period had elapsed. Available evidence suggests that the political gain for the European Union to retain the disputed trade restrictions is high [for public health concerns ("hormones") and the treatment of former colonies ("bananas")].

For the remainder of the analysis, it is assumed that the defendant implements after a period $t_{impl} = \tau$, *before* compensating measures are taken. Any other equilibrium, in particular if the defendant does not comply with a probability $\gamma$, can be modeled in an analogous way.

## 4.2 The Appeal Stage

An appeal by one of the parties suffices to have the issue in question reviewed by the appellate body. "Appellate review" is the equilibrium of the game as long as the expected payoffs for "appeal" are higher than "nonappeal" for one litigant.[20] The optimal strategies of the players are as follows.

*Prediction 2* (appellate review). A losing defendant appeals even if the chance of a reversal of the panel's findings $\mu$ is zero. A losing complainant appeals if either reputation gains $R_{app}^{C}$ or the reversal probability $\nu$ are strictly greater than zero.

*Proof.* The claim is easily verified by inspecting the relevant payoffs of the game (see section A.1 in the appendix).

There is an overwhelming incentive for the losing government to appeal against the panel report. Consider for example the case of the losing defendant. There are three reasons for our prediction: First and most important, the negative panel finding, and consequently implementation, can be delayed at least for a certain period of time, resulting in an additional trade-related rent. Second, the government may secure political support from involved interest groups. Especially for sensitive issues, as for example the EU "hormones" and "banana" cases, domestic political pressure to appeal is substantial. Finally, there is a small probability $\mu$ that the panel finding is reversed by an appellate review. Consequently the appellate review procedure is likely to be evoked in a large number of cases.

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20. The strictly legal function and expertise of the appellate body should ensure unity of interpretation of international law and should rule out that the outcome of an appellate review depends on which country appeals. Once one country appeals, it is virtually costless for the other country to appeal too.

In fact, 24 of 28 cases which have gone through the panel stage so far have been consequently appealed.[21] In 21 disputes an appellate review was requested by the losing defendant,[22] in one by the losing complainant (DS22), and twice by one or both contestants in disputes with ambiguous panel findings (DS69, DS70). Only four panel reports—one in favor of the defendant (DS44),[23] two in favor of the complainant (DS99, DS126), one ambiguous (DS54/55/59/64)—were directly adopted.

The appellate review fully confirmed the findings of the panel report in 21 disputes. In two cases the appeal led to a reversal of the panel findings (DS60, DS62/67/68), and in one case to a partial reversion (DS103/113). A losing defendant obviously appeals even if hopes to win the case are slim. In the latter three cases, the appellate review seems to have fulfilled its anticipated role.

In contrast to the model's prediction, the winning complainant appealed against the findings of the panel report in two cases, the two minor textile cases of developing countries against the United States already mentioned above (DS24 and DS33). Costa Rica as well as India appealed, although the United States had already announced its intention to conform with the panel's findings. A closer inspection of the two cases reveals that the complainants were not primarily interested in the substantive outcome of the review, but rather in legal interpretations and clarifications of the panel's verdict. The reasoning of the appellate review might have been used as (free) legal expertise for future similar trade conflicts.

There is thus empirical support for our prediction that the losing party has an incentive to appeal, in most cases in order to delay the implementation of a negative ruling. Our analysis implies that the high propensity to appeal will not just be a transitory phenomenon likely to disappear after participants have gained greater clarity about the interpretation of WTO law. The decision to appeal is the result of the incentive structure of the game, and is much less influenced by legal

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21. The 28 considered cases comprise only completed disputes and exclude cases currently under appellate review or within two months after the panel decision. A very interesting analysis of 15 appellate reviews from a legal perspective is to be found in Vermulst, Mavroidis, and Waer (1999).

22. Disputes DS2/4, DS8/10/11, DS16/27, DS18, DS26/48, DS31, DS46, DS50, DS56, DS58, DS60, DS62/67/68, DS75/84, DS76, DS87/109/110, DS90, DS98, DS103/113, and DS121.

23. DS44 is an interesting case: Although the trade conflict was between the United States and Japan officially, the dispute was in fact between two companies (Kodak and Fuji) with no or only minor government involvement. The U.S. government lost the case because there was not sufficient government involvement to defend a nonviolation complaint. Nevertheless, the United States was granted concessions by the Japanese government in competition policy.

uncertainty. Nevertheless, legal aspects during appellate review do play a role. In at least three cases the appellate review has acted as a safeguard against a legally wrong panel decision. The review's legal expertise can also be valuable for winning complainants because it constitutes important and costless information for future cases.

### 4.3 Complainant's Strategy (Notification and Panel Request)

After the introduction of a potential trade restriction, the complainant can initiate all moves until a first decision is made by the WTO panel. Its optimal strategy in view of the anticipated reaction of the defendant can be summarized by the following predictions:

*Prediction 3a* (panel request). The complainant always requests the panel at the earliest possible date.

*Prediction 3b* (filing decision). The probability $\pi$ to win the trial has to exceed a threshold value $\bar{\pi}$ before a complaint is filed, where

$$\bar{\pi} = \frac{\left(R_{\text{lose}}^C - R_{\text{app}}^C\right) + K^C}{\tilde{L} + \left(R_{\text{lose}}^C - R_{\text{app}}^C\right) + R_{\text{win}}^C} \tag{3}$$

A nuisance suit ($\pi = 0$) is only optimal if the domestic political gain of an appeal after a negative panel decision offsets both the international reputation loss of losing the case and the direct process cost ($R_{\text{app}}^C \geq R_{\text{lose}}^C + K^C$).

*Prediction 3c* (notification). For $\pi \geq \bar{\pi}$, the complainant notifies WTO at the earliest possible date.

*Proof.* Predictions 3a and 3c are obvious, because any delay reduces expected payoffs.

Equation (3) in Prediction 3b can be derived from the condition that the complainant's expected payoff in the prepanel stage has to be greater than the reservation payoff without a complaint (i.e, $-lt - \tilde{L}$, see Equation (A2) in Appendix A.2).

Note that Equation (3) hinges crucially on the fact that the complainant can force a decision (and attain $R_{\text{win}}^C$), and that the losing defendant complies after the reasonable period $\tau$. In case the latter requirement is not satisfied $\tilde{L}$ has to be replaced by $(1 - \gamma)\tilde{L}$, where $\gamma \geq 0$ captures the probability of noncompliance or any additional delays in implementation. This allows an interesting comparison between the dispute settlement under GATT and WTO. The required confidence level $\bar{\pi}$ depends negatively on both the strength of the implementation mechanism [as measured by $(1 - \gamma)$], and the possibil-

Table 3. Distribution of Waiting Times Between Notification and Panel Request

| $t_{\text{notif} \rightarrow \text{panel}}$ | 0–59 | 60–89 | 90–119 | 120–149 | 150–179 | 180–269 | 270–360 | > 360 |
|---|---|---|---|---|---|---|---|---|
| Cases | 6 | 25 | 10 | 7 | 7 | 9 | 4 | 7 |

ity to reach a favorable decision (and therefore get $R^C_{\text{win}}$). Both components were certainly weaker in expected terms under the GATT system (due to blocking of decisions and the absence of an effective implementation procedure) than under the WTO mechanism. It is therefore not surprising that the new dispute settlement system has led to a substantial increase in complaints.

The agenda-setting capacity of the complainant, moreover, should lead to a relatively tight schedule of the dispute settlement system. In most instances, the complainant will not file a suit until his chances to win the case are sufficiently high. Nuisance suits cannot be completely excluded in situations in which domestic pressure to sue has a much higher impact on political support than an expected loss.

In support of Prediction 3a, Table 3 shows the distribution of waiting times between notification and panel request (74 cases). The data show a peak at time periods between 60 (the legal minimum) and 90 days, but also a considerable dispersion. Note that many cases are delayed due to bundling of panel requests for related cases or to holidays. Waiting times of less than 60 days represent disputes in which the complainant could prove to have notified the defendant in an acceptable way outside the official procedure. Preliminary evidence suggests that multicomplainant settings lead to a longer waiting time between notification and panel request, presumably due to coordination problems.

Unfortunately empirical support for the complainant's filing decision, and hence on Prediction 3b, is only indirect. For completed cases there is no evidence of nuisance suits. Among the 44 panel decisions, only 2 were entirely in favor of the defendant. In both cases (DS22 and DS44) the complainant "lost" because WTO law was not applicable to the trade measure in question. Two other cases led to verdicts in favor of the defendant only after a reversal of the panel's findings by the appellate review (DS60 and DS62/67/68), which means that the cases were far from being clear-cut ex ante. The same is true for four cases with an ambiguous verdict. The remaining 38 cases ended with clear decisions in favor of the complainant.

In the vast majority of cases, the initiation of the trade restriction is unknown. Prediction 3c is thus not directly verifiable. Moreover, the substantial changes in the structure of the dispute settlement mechanism might have led to a backlog and clustering of cases, which complicates the analysis even if the onset of a trade restriction were known.

## 4.4 Introduction of a New Trade Measure

Given the parties strategies during litigation, does the dispute settlement system discourage the introduction of new trade restrictions? Trade-related payoffs for the defending country accrue with certainty during the whole process. Positive expected payoffs are therefore feasible even for a very small probability $1 - \pi$ of being able to maintain the trade measure after the conclusion of the dispute. The defendant's optimal strategy can be stated as follows:

*Prediction 4* (new trade restriction). The future defendant introduces a trade measure if

$$(1 - \pi)\tilde{G} + gt + \pi\left(R_{\text{app}}^D - R_{\text{lose}}^D\right) + (1 - \pi)R_{\text{win}}^D - K^D \geq 0.$$

When $\pi = 1$ (i.e., when both parties are certain of panel finding in favor of the complainant), the condition for the introduction of a trade restriction is $gt + R_{\text{app}}^D \geq R_{\text{lose}}^D + K^D$: The future defendant will introduce the trade restriction, if rents anticipated to accrue during the whole process plus reputation gains from satisfying domestic interest groups exceed the expected reputation loss of a lost trial plus direct process costs.

*Proof.*   Follows directly from the defendant's expected payoff [Equation (A1)] in Appendix A.

If domestic pressure to introduce and maintain a trade restriction is larger than (international) reputation losses plus litigation costs, the dispute settlement system cannot prevent a welfare decreasing policy. If we allow for the possibility that noncompliance is the optimal strategy, incentives for introducing trade restrictive measures are stronger yet, even if the probability of losing is one. The agenda-setting capacity of the complainant, together with the elimination of blocking should limit the potential direct gains of the trade restriction (as measured by $gt$) during WTO litigation. The possibility of appeal, on the other hand, provides the losing defendant with a potential (domestic) reputation gain. If the former effect dominates, the number of new trade distortions should decrease compared to GATT.

Of course, direct empirical evidence of our prediction is not available, as the motives of trade policy measures are not verifiable. Potential gains from a trade restriction accruing during the litigation process are most likely to be anticipated, however. In the recent Foreign Sales Corporation conflict between the United States and the European Union (DS108) with an affected trade volume of several billion dollars, gains due to the delay in the procedure and the absence of retaliation

measures before the end of a reasonable implementation period have even been advertised.[24]

## 4.5 The Scope for Bilateral Settlements

Bilateral settlements between the two parties are feasible if they provide a higher expected payoff for both countries than a continuation of the formal litigation process. The refusal of either party to accept an informal solution suffices to continue the formal dispute settlement procedures. The noncooperative game without intermediate bargaining therefore constitutes a lower bound—and thus the threat point—for both parties' expected payoffs at every stage of the formal dispute settlement system. By a mutual agreement, the parties forego potential future reputation gains and losses, but save litigation costs at early stages. In addition, direct trade gains and losses are reduced in relation to the litigation time saved.

Pecuniary compensation payments between two countries are rather uncommon (but not excluded, e.g., in the form of additional development assistance). Therefore bilateral settlements will very likely result in a compromise on the trade measure in question. This can also entail that the complainant is granted the right to some compensating trade restrictions. In order to avoid arbitrary assumptions about the nature of the bargaining between the two countries and its possible outcomes, we merely consider the polar cases "trade restriction maintained" and "trade restriction suspended" (see Appendix A.3 for the respective payoffs). For each possible settlement period we compute the sum of payoffs for both polar cases as a proxy for the *cooperative value* of the settlement. In an analogous way, the players' payoffs from completing the formal dispute settlement procedure are computed as a proxy for the *noncooperative value* of the game.[25]

Bilateral settlements can be expected to be less clear cut in favor of either party than decisions by the WTO DSB. The retreating party (either the defendant abolishing the trade restriction or the complainant giving up the complaint) has to be compensated for potential reputation payoffs, and for the probability that he might have won the case after all. If the expected panel decision unclear (i.e., $0 < \pi < 1$),

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24. PricewaterhouseCoopers Tax News Network, for example, states in February 1999: "Because WTO-ordered change in the FSC regime would be prospective in application, and would not likely be effective until 2001, it may still be worthwhile to set up a FSC if the start-up costs can be recouped in about one year or less."

25. If payoffs were pecuniary, a nonstrategic bargaining model would assume that disputes will always be settled informally when the cooperative value is perceived to be greater than the noncooperative value of the game, whereas disputes will finally be decided by the WTO when the former is perceived to be smaller. Although a direct application of this rule is not possible in our much more complex situation, we hopefully still get some information from such an exercise.

the country with the larger absolute gain or loss will have an advantage in bilateral settlements, as it is more difficult for its opponent to offer sufficient compensation in order to retain its previous position. For the two polar cases $\pi = 0$ and $\pi = 1$, only the forgone net (political) reputation gains have to be considered. This is also true after the conclusion of the interim report when the position of the WTO is relatively clear.

*Prediction 5a.* Bilateral settlements are biased toward the expected outcome of the formal dispute settlement procedure for values of $\pi$ close to 1 or 0, and especially so after the conclusion of the interim report.

For intermediate values of $\pi$, the cooperative value of the game is largely dominated by the relative size of the trade-related continuation gains and losses $\tilde{G}$ and $\tilde{L}$. A mutual agreement is biased toward the country with the higher absolute gain or loss.

*Proof.*   The claim can be derived by comparing cooperative and noncooperative values of the game (as stated in Appendix A.3).

An additional variable of interest is the timing of bilateral settlements. In the absence of shocks to the probability and cost structure, there are three windows for bilateral settlements: Between notification and the establishment of a panel; during the panel stage (when both parties experience direct process costs $K^D$ and $K^C$), but before the completion of the interim report; and finally between the interim report (when most uncertainty is resolved) and the circulation of the final panel report. Note that although interim and panel reports hardly ever differ, there are notable differences in payoffs between the two stages, because some reputation costs and gains are only relevant when the DSB's findings become public knowledge, that is, after the conclusion of the panel report. The parties can still settle at this point as the content of the interim report is kept confidential. As we have shown above, a potential mutual agreement after the interim report will be biased toward a large reduction in the disputed trade restriction. Moreover, the larger $R^D_{\text{lose}} - R^D_{\text{app}} - R^C_{\text{win}}$, the more probable is a bilateral settlement at this point. A complainant with a minor (reputation) stake in case of victory will agree to terminate the case at this point in time, in exchange for a sufficient reduction or suspension of the trade measure.[26]

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26. Petersmann (1997) argues that the willingness of developing countries to terminate panel proceedings at this stage might reflect the relatively low gain from winning the case $R^C_{\text{win}}$, such that their gain from a bilateral settlement is much larger. However, under the new WTO dispute settlement system only a single case could be observed so far.

After the panel report has been circulated among the WTO members, there is little scope for a bilateral settlement. The implementation of the panel's findings is closely monitored by the DSB. Predications 5b and 5c summarize the likelihood of mutual agreements at different stages of the dispute:

*Prediction 5b.* The larger $R_{\text{lose}}^D - R_{\text{app}}^D - R_{\text{win}}^C$, the more likely a bilateral settlement after the conclusion of an interim report, but before the circulation of the panel report.

*Prediction 5c.* Mutually agreed solutions are more likely at an early stage of the process, in particular before the complainant is granted a panel.

*Proof.* For Prediction 5b, note that the noncooperative value of the game is a decreasing function of $R_{\text{lose}}^D - R_{\text{app}}^D - R_{\text{win}}^C$, while the cooperative values are constant. Prediction 5c follows from the fact that before the panel stage, the avoidance of litigation costs $K^C$ and $K^D$ can favor a bilateral settlement.

The appearance of new information and the joining of third parties can change payoff components, above all, direct process costs $K^{C,D}$ and the probability $\pi$ of success of a complaint. Their impact on the likelihood of bilateral settlements can be summarized as follows:

*Prediction 5d.* The likelihood of a bilateral settlement

- Increases in $\pi$ if the defendant's net payoff loss from losing the case ($R_{\text{lose}}^D - R_{\text{app}}^D$) is sufficiently high.
- Decreases in $\pi$ if the complainant's payoff gain from winning the suit is sufficiently high.
- Increases in direct litigation costs $K^C$ and $K^D$.

*Proof.* The claim follows from a comparison of cooperative and noncooperative values of the game. It is also illustrated below.

Let us assume that trade-related payoffs of the disputed restriction are perceived as being symmetric, that is, $\tilde{G} = \tilde{L}$ and $g = l$. Then the noncooperative value of the game is

$$\Phi^C + \Phi^D = \pi\left(R_{\text{app}}^D - R_{\text{lose}}^D + R_{\text{win}}^C\right) + (1 - \pi)\left(R_{\text{app}}^C - R_{\text{lose}}^C - R_{\text{win}}^D\right) - K^D - K^C,$$

which can be larger or smaller than zero, depending on the payoff components. A situation in which previously $\Phi^C + \Phi^D \geq 0$ can sud-

denly open up room for a bilateral settlement in various cases: The costs of undergoing the formal procedure may increase for the defendant if third parties enter in favor of the complainant ($K^D$ increases). An increase (decrease) in $\pi$ opens up opportunities for mutual agreements, provided the sum $(R_{\text{lose}}^D - R_{\text{app}}^D) + R_{\text{win}}^D + (R_{\text{lose}}^C - R_{\text{app}}^C) - R_{\text{win}}^C$ is positive (negative). Bilateral settlements become more likely if the defendant's payoff loss from losing the case is high, and less likely if the complainant's payoff gain from winning the suit is high.

Although many cases that are settled bilaterally do not enter official records, at least 29 cases (seem to) have been settled without recourse to the formal procedure. In support of our prediction, a majority of 24 cases have been settled after notification but before the establishment of the panel. In five of these cases, the complainant requested a panel before a mutual agreement could be reached. Four settlements could be observed after the establishment of the panel, but before a first decision of the WTO DSB. Only one of the disputes ended in a mutual agreement right after the conclusion of the interim report which prevented circulation of the panel report—and consequently the disclosure of its findings.

## 5. Summary and Conclusions

Based on the analysis of the different stages of the WTO dispute settlement system, we can now answer the questions formulated in the introduction and try to draw some conclusions for possible improvements of an international dispute settlement system.

First, the preventive power of the WTO dispute settlement system is too limited to discourage new trade restrictions. Even if the probability of winning a case is slim, countries have an incentive to introduce trade restrictions, as rents continue to accrue during the litigation process, and sanctions or compensations for past damages do not exist. On the other hand, the likelihood of a nuisance suit against a well-behaved country is rather small. A complaint is only filed if the probability of winning is sufficiently high.

Second, there is a strong tendency for the losing government to appeal against the panel decision, even if the chances of a revision are slim. An appeal delays the implementation of negative findings and suits the interests of domestic groups. This obviously has consequences for the way the parties perceive the dispute settlement process, as they plan for an appeal right from the start.[27] The appellate review's legal

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27. As Petersmann (1997) points out, this could—especially in the long run—weaken the authority of first-instance panel reports. According to Petersmann (page 188), the strong tendency to appeal an unfavorable panel decision *"might even lead to the view that governments be granted the right of direct access to the quasi-judicial appellate body rather than be obliged, without exception, to undergo the time and effort of a preliminary panel procedure prior to the final appellate body report."*

expertise might be used even by winning complainants with a view to accumulate arguments for future disputes on similar issues.

Third, the implementation stage, together with the absence of sanctions for damages during litigation, are the weakest elements of the new dispute settlement system. In case of a panel/appellate review decision in favor of the complainant, the defendant has strong incentives to delay implementation. Unless reputation losses of nonconforming countries are sufficiently high, the limited threats of compensation payments or retaliation measures fail to provide the loser country's with an incentive to implement the panel's recommendations quickly.

Fourth, bilateral settlements are more likely to be observed at an early stage of the litigation process. In clear-cut cases, the results of bilateral settlements should be similar to the expected ruling of the DSB. The losing party can avoid reputation losses (often at the price of giving up its position immediately) by agreeing upon a mutually accepted solution. Changes in the expected outcome of the process and in payoff elements, in particular by joining third parties, have an impact on the scope for bilateral settlement.

Compared to the GATT mechanism, the new dispute settlement system is more effective. WTO decisions cannot be blocked by a single country, which limits the (political) gains from trade distortions. The relatively tight schedule of the new dispute settlement system (the complainant has control over many timing decisions) reduces the gains and losses of inefficient trade measures by limiting the period during which they are effective. This impact is twofold: It leads to a reduction in the threshold level to sue, and consequently triggers a higher number of justified complaints. On the other hand, trade distortions may now prove unprofitable due to the limited time they can be active, which may reduce the number of potential complaints.

Some features of the new dispute settlement mechanism are well designed, while others are not. The complainant's agenda-setting capacity obviously limits the time a trade restriction can remain active. This is, however, partially offset by the weak enforcement mechanism during the implementation stage. Moreover, the lack of effective sanctions for noncompliance with WTO law further weakens the threat of the system, unless nonconforming countries experience sizable reputation losses. Nevertheless, the great number of dispute settlement cases so far should be interpreted as a signal of confidence in the new litigation process rather than as a failure of the WTO's aim to maintain an internationally liberal trade regime.

## Appendix A: Payoffs

In this appendix we keep track of all the payoffs of the game. Note that payoffs $\Phi^C$ and $\Phi^D$ are always understood as (expected) payoffs and

are computed from the time the decision is made. Subscripts mark the stage of the dispute settlement process at the relevant decision nodes.

## A.1 Appellate Review

Depending on the outcome of the panel report, the expected payoffs for complainant and defendant undergoing appellate review are as follows:

$$\Phi^D_{[\text{app}|\text{panel}=C]} = \mu\tilde{G} + g(t_{\text{impl}} + t_{\text{app}}) + R^D_{\text{app}} \geq gt_{\text{impl}} = \Phi^D_{[\text{no-app}|\text{panel}=C]}$$

$$\Phi^D_{[\text{app}|\text{panel}=D]} = (1 - \nu)\tilde{G} + g(t_{\text{impl}} + t_{\text{app}}) \leq \tilde{G} + g(t_{\text{impl}} + t_{\text{app}})$$

$$= \Phi^D_{[\text{no-app}|\text{panel}=D]}$$

$$\Phi^C_{[\text{app}|\text{panel}=D]} = -(1 - \nu)\tilde{L} - l(t_{\text{impl}} + t_{\text{app}}) + R^C_{\text{app}}$$

$$\geq -\tilde{L} - l(t_{\text{impl}} + t_{\text{app}}) = \Phi^C_{[\text{no-app}|\text{panel}=D]}$$

$$\Phi^C_{[\text{app}|\text{panel}=C]} = -\mu\tilde{L} - l(t_{\text{impl}} + t_{\text{app}}) \leq -lt_{\text{impl}} = \Phi^C_{[\text{no-app}|\text{panel}=C]}$$

Note that in computing these payoffs we suppose that the losing defendant complies after $t_{\text{impl}}$ ($= \tau$).

## A.2 Prepanel Stages

Note that $t$ denotes the expected time until the end of the litigation process. The defendant's expected payoff is

$$\Phi^D_{\text{prepanel}} \equiv \pi\left[\Phi^D_{[\text{app}|\text{panel}=C]} - R^D_{\text{lose}} + (1 - \pi)\left\{\Phi^D_{[\text{app}|\text{panel}=D]} + R^D_{\text{win}}\right\}\right.$$

$$+ gt - K^D$$

$$= \pi\mu\tilde{G} - \pi R^D_{\text{lose}} + \pi R^D_{\text{app}} + (1 - \pi)(1 - \nu)\tilde{G}$$

$$+ (1 - \pi)R^D_{\text{win}} + gt - K^D$$

$$= (1 - \pi)\tilde{G} + gt + \pi\left(R^D_{\text{app}} - R^D_{\text{lose}}\right) + (1 - \pi)R^D_{\text{win}} - K^D. \tag{A1}$$

The last equality follows from our restricting assumption about revision probabilities in Equation (1). Correspondingly the complainant's expected payoff can be written as

$$\Phi^C_{\text{prepanel}} \equiv \pi\left\{\Phi^C_{[\text{app}|\text{panel}=c]} + R^C_{\text{win}}\right\} + (1 - \pi)\left\{\Phi^C_{[\text{app}|\text{panel}=d]} - R^D_{\text{lose}}\right\}$$

$$- lt - K^C$$

$$
\begin{aligned}
&= -\pi\mu\tilde{L} + \pi R_{\text{win}}^{C} - (1-\pi)(1-\nu)\tilde{L} + (1-\pi) R_{\text{ann}}^{C} \\
&\quad - (1-\pi) R_{\text{lose}}^{C} - lt - K^{C} \\
&= -(1-\pi)\tilde{L} - lt + (1-\pi)\left( R_{\text{app}}^{C} - R_{\text{lose}}^{C} \right) + \pi R_{\text{win}}^{C} - K^{C}.
\end{aligned}
\tag{A2}
$$

From Equation (A2) the minimum level $\bar{\pi}$ to file can be computed from the condition $\Phi_{\text{prepanel}}^{C} \geq -\tilde{L} - lt$ (the reservation utility without complaint).

## A.3 Bilateral Settlements

The threat point and consequently the noncooperative value of the game is the sum of the expected payoffs of the reference scenario without bilateral settlements. We also consider the two polar cases "trade restriction maintained" (denoted by a $+$) and "trade restriction suspended" (denoted by a $-$).

After the interim report, the noncooperative values of the game (conditional on which country has won in the interim report) and the two polar outcomes (as cooperative values) are as follows:

$$
(\Phi^{C} + \Phi^{D})|_{\text{interim}=C} = \mu(\tilde{G} - \tilde{L}) + t(g - l) + R_{\text{app}}^{D} - R_{\text{lose}}^{D} + R_{\text{win}}^{C}
$$

$$
(\Phi^{C} + \Phi^{D})|_{\text{interim}=D} = (1-\nu)(\tilde{G} - \tilde{L}) + t(g - l) + R_{\text{app}}^{C}
$$
$$
+ R_{\text{lose}}^{C} + R_{\text{win}}^{D}
$$

$$
\Phi^{C,-} + \Phi^{D,-} = 0
$$
$$
\Phi^{C,+} + \Phi^{D,+} = (\tilde{G} - \tilde{L}) + t(g - l).
$$

Before the interim report, the threat point and the two polar cooperative outcomes are

$$
\Phi^{C} + \Phi^{D} = (1-\pi)(\tilde{G} - \tilde{L}) + t(g - l) + \pi\left( R_{\text{app}}^{D} - R_{\text{lose}}^{D} + R_{\text{win}}^{C} \right)
$$
$$
+ (1-\pi)\left( R_{\text{app}}^{C} - R_{\text{lose}}^{C} + R_{\text{win}}^{D} \right) - K^{D} - K^{C}
$$

$$
\Phi^{C,-} + \Phi^{D,-} = 0
$$
$$
\Phi^{C,+} + \Phi^{D,+} = (\tilde{G} - \tilde{L}) + t(g - l).
$$

Assume that the disputed trade measure is perceived as a zero game in trade-related rents from both parties views, that is, $\tilde{G} = \tilde{L}$ and $g = l$.

Then the noncooperative value of the game is

$$
\Phi^C + \Phi^D = \pi\left(R_{\text{app}}^D - R_{\text{lose}}^D + R_{\text{win}}^C\right) + (1 - \pi)\left(R_{\text{app}}^C - R_{\text{lose}}^C + R_{\text{win}}^D\right)
$$
$$
- K^D - K^C. \tag{A3}
$$

## Appendix B: United States—Standards for Reformulated and Conventional Gasoline, Complaint by Venezuela (DS 2)

On January 23, 1995, Venezuela requested consultations with the United States concerning standards for reformulated and conventional gasoline. The dispute related to a U.S. domestic legislation called the "Clean Air Act of 1990," and especially to the "Regulation of Fuels and Fuel Additives—Standards for Reformulated and Conventional Gasoline" enacted by the U.S. Environmental Protection Agency. This regulation was enacted to control toxic and other pollution caused by the combustion of gasoline manufactured in or imported into the United States.

Consultations were held between Venezuela and the United States on February 24, 1995, but the parties failed to reach a mutually satisfactory solution. Consequently Venezuela requested the establishment of a panel on March 25, 1995 (61 days after notification of WTO). On April 10, 1995, the DSB established a panel. At the same time, Brazil requested consultations with the United States concerning the same facts, and—after their failure—required the establishment of a panel (reference DS 4). The DSB decided that the case was to be taken over by the previously established panel for Venezuela.

On January 17, 1996, the panel report was circulated among WTO members. The DSB followed the arguments of the complainants. On February 21, 1996, the United States notified the DSB of its decision to appeal certain issues of law and legal interpretations in the panel report. The report of the appellate review was circulated among WTO members on May 20, 1996. The appellate body upheld the findings of the panel/DSB. The United States was granted a standard implementation period of 15 months. Approximately 17 months later, on October 17, 1997, the United States informed the WTO of its compliance with the requirements of the DSB.

## Appendix C: Data

The database has been prepared by and is available from Monika Bütler upon request. Table C.1 contains cases mentioned explicitly in this article. They are numbered by their official WTO label. Additional information, including panel and appellate review reports, can also be found on the WTO's webpage (www.wto.org/wto/dispute).

Table C.1

| DS No. | Defendants | Complainants | Disputed Matter |
|---|---|---|---|
| 2, 4 | US | Venezuela, Brazil | Standards for Reformulated and Conventional Gasoline |
| 8, 10, 11 | Japan | EU, Canada, US | Taxes on Alcoholic Beverages |
| 16, 27 | EU | Ecuador, Guatemala, Honduras, Mexico, US | Regime for the Importation, Sale and Distribution of Bananas |
| 18 | Australia | Canada | Measures Affecting the Importation of Salmon |
| 22 | Brazil | Philippines | Measures Affecting Desiccated Coconut |
| 24 | US | Costa Rica | Restrictions on Imports of Cotton and Man-Made Fibre Underwear |
| 26, 48 | EU | US, Canada | Measures Affecting Meat and Meat Products (Hormones) |
| 31 | Canada | US | Certain Measures Concerning Periodicals |
| 33 | US | India | Measure Affecting Imports of Woven Wool Shirts and Blouses |
| 44 | Japan | US | Measures Affecting Consumer Photographic Film and Paper |
| 46 | Brazil | Canada | Export Financing Programme for Aircraft |
| 50 | India | US | Patent Protection for Pharmaceutical and Agricultural Chemical Products |
| 54, 55, 59, 64 | Indonesia | EU, Japan, US | Certain Measures Affecting the Automobile Industry |
| 56 | Argentina | US | Certain Measures Affecting Imports of Footwear, Textiles, Apparel and Other Items |
| 58 | US | India | Import Prohibition of Certain Shrimp and Shrimp Products |
| 60 | Guatemala | Mexico | Anti-Dumping Investigation Regarding Imports of Portland Cement |
| 62, 67, 68 | EU, UK, Ireland | US | Customs Classification of Certain Computer Equipment |
| 69 | EU | Brazil | Measures Affecting Importation of Certain Poultry Products |
| 70 | Canada | Brazil | Measures Affecting the Export of Civilian Aircraft |
| 75, 84 | Korea | EU, US | Taxes on Alcoholic Beverages |
| 76 | Japan | US | Measures Affecting Agricultural Products |
| 87, 109, 110 | Chile | EU | Taxes on Alcoholic Beverages |
| 90 | India | US | Quantitative Restrictions on Imports of Agricultural, Textile and Industrial Products |
| 98 | Korea | EU | Definitive Safeguard Measure on Imports of Certain Dairy Products |
| 99 | US | Korea | Anti-Dumping Duty on Dynamic Random Access Memory Semiconductors (DRAMS) of One Megabit or Above |
| 103, 113 | Canada | US, NZ | Measures Affecting the Importation of Milk and the Exportation of Dairy Products |
| 108 | US | EU | Tax Treatment for "Foreign Sales Corporations" |
| 121 | Argentina | EU | Safeguard Measures on Imports of Footwear |
| 126 | Australia | US | Subsidies Provided to Producers and Exporters of Automotive Leather |

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