Third-Party-Assisted Renegotiation of Trade Agreements

Mostafa Beshkar*
University of New Hampshire

December 2010 (First Draft: October 2008)

Abstract

I study renegotiation of trade agreements when governments have the option to resort to 'non-binding' arbitration to settle their disputes. The model is rich enough to allow for pre-trial and post-trial settlement negotiations, non-compliance, and retaliations in a setting like the WTO. Among other results, I find that governments benefit from the existence of an arbitration system even if this system is non-binding and has no informational advantage over the disputing parties. However, due to uncertainty in the rulings of the DSB, the disputants have a collective interest in finding a settlement without resorting to DSB arbitration. Nevertheless, governments occasionally resort to arbitration, while they may choose not to comply with the rulings. Moreover, an optimal arbitration system always rules at least partly against the defendant, which may explain the apparent pro-complainant bias in the WTO rulings.

*Assistant Professor of Economics and Peter Paul Research Fellow, University of New Hampshire, mostafa.beshkar@unh.edu.

1 Introduction

When do disputes occur in the implementation of trade agreements? How can governments benefit from non-binding arbitration of a third party such as the WTO Dispute Settlement Body? Why do governments sometimes choose not to comply with the WTO rulings? Although the literature on international institutions, and particularly the WTO, has flourished in the past decade, in the words of a prominent WTO scholar in 2009, "we are still far away from developing a comprehensive theory of disputes – there are no models predicting when disputes will occur in a setting like the WTO."[1]

This paper provides a comprehensive model of dispute settlement in international institutions, with a focus on the WTO as a leading example of an international organization with significant impact on intergovernmental relations. The model covers initiation of disputes, possibility of resorting to WTO arbitration, and bilateral settlement negotiations before and after WTO arbitration.

This paper contributes to the existing literature in two important ways. First, the Dispute Settlement Body (DSB) of the WTO is modeled as a "non-binding" arbitration system, which reflects the fact that sovereign governments are not bound to comply with the rulings of an international institution. In case of the WTO, in about one out of every five cases for which the DSB has issued a final ruling, the defending governments allegedly failed to bring their action in compliance with the DSB recommendations immediately (Wilson 2007).[2] This paper provides a theoretical explanation of how noncompliance with the DSB rulings may occur in equilibrium without endangering the existence of the institution.

A second main contribution of the paper is the study of bilateral settlement

[1] From Petros Mavroidis foreword to Schropp (2009).

[2] Examples of non-compliance with the WTO rulings include the Hormones dispute between the European Communities (as defendant) and the United States and Canada (as complainants), in which the European Communities declined to comply with the DSB's ruling to lift a ban on importation of beef products from US and Canada (WTO c). Another example is provided by the Canada-Dairy dispute, in which case the DSB's ruling against Canada was followed by a long period of negotiation between disputing parties. After more than three years of negotiations, the parties achieved a mutually accepted solution that was different from the original ruling of the DSB (WTO a).

negotiation in shadow of DSB arbitration. Some 60 percent of disputes initiated under the auspices of the WTO are settled without resorting to DSB arbitration. Pre-trial settlement may have an important selection effect on the combination of cases that reach the trial stage.[3] Therefore, because of its explicit treatment of dispute initiation and pre-trial settlement negotiation, the proposed model can be useful in guiding empirical investigations of the WTO dispute settlement process.

I take the view that the dispute settlement process is effectively a "renegotiation" process in which governments try to adjust their trade policies to reflect changes in political and economic circumstances. I assume that governments have private information about the fluctuating political-economy conditions in their respective countries. A disagreement naturally arises if some contingencies are not symmetrically observable to all the trading partners. Allowing for renegotiation of the agreement is then interpreted as a means to settle potential disputes through an ex-post bargaining process.

Using a mechanism design approach, I model the DSB as an impartial entity that provides 'recommendations' for the resolution of disputes based on its imperfect observation of the state of the world. The recommendations of the DSB set a reference point to calculate the size of violation that the defending party's proposed policy entails. The size of violation then determines the size of retaliatory measures to be imposed by the complaining party. The DSB can use its imperfect but informative signal about the state of the world to set a reference point that favors the party who is more likely to have a legitimate claim. Such a ruling strategy by the DSB increases the efficiency of the bargaining outcome by reducing the cost of providing incentive for revelation of private information.

Assuming an 'informational' role for the DSB seems to be broadly consistent with its mandate explained in the Dispute Settlement Understanding (DSU) document. Article 11 of DSU gives the dispute panels the authority to make "objective assessment of the facts" of the dispute case concerned and to make "recommendations" to

[3] According to the WTO website (checked January 2010), so far 402 formal disputes have been initiated under the auspicies of the DSU from which more than 40 percent resulted in a panel report. For statistical description and discussions about the level of utilization of the WTO dispute settlment process see Horn and Mavroidis (2006), Bown (2005, 2009), and Beshkar (2008).

help the disputing parties to develop a mutually satisfactory solution (WTO b). This implies that the rulings of the DSB are not binding in the sense that a convicted defending party can decline to comply with the rulings. The rulings of the DSB, however, affects the prospect of renegotiations by setting a reference point that will be used to determine the size of retaliation in case of non-compliance.

I then extend this model by allowing pre-trial settlement bargaining. Within the framework of this paper, due to a concave joint welfare function, the disputing parties have a collective incentive to avoid the uncertainty of the litigation outcome by settling their dispute without resorting to DSB arbitration. In practice, another obvious incentive for an out-of-court settlement is to avoid the cost of litigation. However, in order to highlight the effect of uncertain DSB outcome on the pattern of dispute settlement, I make the aggressive assumption of zero litigation cost in the WTO.[4]

Pre-trial settlement negotiation is modeled as a signaling game in which the importing country proposes a trade policy adjustment and the exporting country decides whether to accommodate this proposal or to request DSB arbitration. The model predicts that exporting countries tolerate relatively minor deviations from the tariff bindings and, thus, a dispute is generated only if a relatively large deviation is observed. Moreover, a dispute in which the defending party has a strong case is more likely to reach the formal trial stage. As a result, the DSB can rule more aggressively in favor of the defending party when parties engage in pre-trial settlement negotiations.

This paper also provides a novel interpretation of the observed bias in the DSB rulings. As discussed by Sykes (2003), Grossman and Sykes (2007), and Colares (2009), in a strong majority of the cases the DSB rules at least partly against the defending party. The model suggests that this ruling pattern may be part of the optimal design of the system. In particular, even if the DSB's assessment of the disputed measure is in favor of the defending party, it is optimal for the DSB to

[4]This assumption of the model may be particularly appealing to many observers of the WTO who consider the litigation costs to be small compared to the size of the stake at dispute in many WTO disputes.

authorize only a small deviation from the agreement tariff.

The application of the model presented in this paper is not limited to the DSB. This paper shows that how an impartial third party with expertise in the subject of the dispute can improve the relationship between the trading partners. For example experts from World Health Organization and International Monetary Fund can play a useful role in the arbitration process in cases that are related to health and exchange rate policy, respectively.[5]

After reviewing the relevant literature in the next subsection, in Section 2 I introduce the economic and political environment in which trade agreements are negotiated and implemented. In Section 3, I introduce a tariff bargaining game that is not assisted by a third party. In Section 4, I lay out a model of the DSB and post-ruling renegotiation of trade agreements, and characterize the optimal direct revelation mechanism. In Section 5, I offer an alternative institution for dispute settlement that resembles the actual DSB while generating the same outcome as the optimal direct mechanism. Finally, in Section 6 I study pre-trial settlement negotiations in the shadow of a formal trial by DSB. Section 7 concludes.

1.1 Literature review

Beshkar (2010b) and Maggi and Staiger (2011) are among recent papers that provide formal models of the DSB.[6] These models investigate alternative roles that an international tribunal like the DSB can play. Both papers view the DSB as an arbitrator that '*imposes*' a settlement on the disputing parties with the objective to maximize the parties' joint payoff. This is in contrast to the approach that I take here in which I view the DSB's rulings as non-binding recommendations. It should be emphasized that this distinguishing feature of the current paper is very important in understanding the pattern of dispute settlement in the WTO.

In Beshkar (2010b), as in the current paper, the governments may disagree on

[5] I am grateful to Helen Milner for pointing this out to me.

[6] Earlier models of the WTO dispute settlement process include Reinhardt (2001), Ludema (2001), Rosendorff (2005), and Klimenko, Ramey, and Watson (2007). For a survey of these papers see Beshkar (2010b).

the nature of the prevailing contingency due to their asymmetric information of the state of the world. The DSB resolves the dispute by determining the trade policies to be taken by the parties as a function of the parties' announcements and its privately-observed signal of the state of the world.

Maggi and Staiger (2011) consider a costly contracting setting that leads the governments to write incomplete contracts and provide the DSB with a mandate to fill the gaps when disputes arise. By writing an incomplete contract, the governments can avoid the cost of identifying all potential future contingencies. If countries find themselves in a contingency that is not specified by their ex ante contract, the DSB will fill the gap in the contract by determining a trade policy to be adopted by the parties. In making its policy determination, the DSB's objective is to maximize the expected joint payoff of the governments, given its best guess about the governments' preferences.

These models assume that the parties cannot seek a settlement that differs from the DSB's determination even if they can mutually improve their welfare through ex post negotiations. Although these models provide important insights about the role of the DSB, they cannot explain some observed facts about the dispute settlement in the WTO, including the post-DSB negotiations between parties and noncompliance by some convicted parties, some examples of which were discussed above.

In a parallel research, Maggi and Staiger (2009) have developed a model of the DSB that allows for pre-trial and post-trial negotiations between the disputing parties. My paper is different from theirs in a number of important ways. First, they assume that the parties have symmetric information about the state of the world that is not verifiable to the court. Moreover, while I study continuous policies, Maggi and Staiger (2009) focus on disputes about trade policies that are lumpy in nature.

There is a large literature initiated by Myerson (1979, 1991) that explores the problem of binding arbitration, while in this paper my objective is to explain the role of institutions that offer non-binding arbitration. My model also differs from the strand of bargaining models that consider zero-sum bargaining situations. For example, Farber (1980) and Gibbons (1988) analyze a zero-sum bargaining situation in

case of Final-Offer Arbitration (FOA).[7] In a zero-sum bargaining situation, all arbitration outcomes are equally efficient and differ only in distributional consequences.[8] This assumption is obviously not satisfied in a wide range of real world situations, including the case of tariff bargaining, which is the subject of study in this paper.[9]

2 Basic setup

The setup that I use here is based on a simple political-economy trade model that is used frequently in the literature (see, for example, Bagwell and Staiger 2005).

2.1 Markets

Consider a pair of distinct goods x and y with demand functions in the home country (no *) and the foreign country (*) given by:

$$\begin{aligned} D_x(p_x) &= 1 - p_x,\ D_y(p_y) = 1 - p_y, \\ D_x^*(p_x^*) &= 1 - p_x^*,\ D_y^*\left(p_y^*\right) = 1 - p_y^*, \end{aligned} \tag{1}$$

where p (with the appropriate index) represents the price of a good in a certain country. Specific import tariffs, τ and τ^*, that are chosen by countries as the only trade policy instrument, create a gap between domestic and foreign prices. In particular,

[7] FOA is a specific dispute settlement mechanism suggested by Stevens (1966). FOA is a form of binding arbitration under which each party submits a proposed award to the arbitrator, and the arbitrator chooses one award without modification. This approach gives each party an incentive to offer a reasonable proposal in the hope that it will be accepted by the arbitrator.

[8] The arbitrator's objective in these models is to be "fair", while the fair outcome is an uncertain variable regarding which parties and the arbitrator have asymmetric information.

[9] The focus of these models on fairness rather than efficiency may be justified using the argument of the Coase Theorem that parties can reach an efficient outcome through independent bargaining as long as parties have transferable utilities and the bargaining process is not hindered by transaction costs or other impediments. In the case of trade agreements, an important limitation in the bargaining process is the political cost of monetary transfers that leads governments to bargain almost exclusively over policy adjustments. In contrast to monetary transfer, policy adjustment is not a zero-sum transaction, which makes arbitration outcomes efficiency-relevant. In other words governments do not have transferable utilities.

$p_x = p_x^* + \tau$ and $p_y = p_y^* - \tau^*$.

Both countries produce both goods using the following supply functions:

$$\begin{aligned} Q_x(p_x) &= p_x,\ Q_y(p_y) = bp_y, \\ Q_x^*(p_x^*) &= bp_x^*,\ Q_y^*\left(p_y^*\right) = p_y^*. \end{aligned} \tag{2}$$

Assuming $b > 1$, the home country will be a natural importer of x and a natural exporter of y.

Under this model, the market-clearing price of x (y) depends only on the home (foreign) tariff. Let $p_x(\tau)$ and $p_y(\tau^*)$ respectively denote the equilibrium prices of x and y in the home country. If import tariffs are non-prohibitive (i.e., if they are sufficiently small) trade occurs between the countries and the home consumers' surplus from the consumption of x and y will be given by

$$\psi_x(\tau) \equiv \int_{p_x(\tau)}^{1} D_x(u)\,du,\ \psi_y(\tau^*) \equiv \int_{p_y(\tau^*)}^{1} D_y(u)\,du.$$

Moreover, the home producers' surplus from the sale of x and y will be given by

$$\pi_x(\tau) \equiv \int_{0}^{p_x(\tau)} Q_x(u)\,du,\ \pi_y(\tau^*) \equiv \int_{0}^{p_y(\tau^*)} Q_y(u)\,du.$$

The government's tariff revenue is given by

$$T(\tau) \equiv \tau M_x(p_x(\tau)),$$

where $M_x(p_x) \equiv D_x(p_x) - Q_x(p_x)$ is the import demand for good x in the home country.

For reasons that will be clear later, I assume that there is another pair of goods, which are produced and consumed in an identical manner as above. This duplicate economy will make the modelling of the retaliation scheme very simple.

2.2 Political Economy Framework

Following Baldwin (1987), I assume that each government maximizes a weighted sum of its producers' surplus, consumers' surplus, and tariff revenues with a relatively higher weight on the surplus of its import-competing sector. The higher weight given to the welfare of a sector might be the result of political pressure, through lobbying for example, that a government faces. Denoting the political weight on the welfare of the import-competing sector in the home (foreign) country by θ (θ^*), where $\theta, \theta^* \geq 1$, I assume that the home government's welfare drawn from sector x as a function of the home import tariff is given by

$$u(\tau;\theta) \equiv \psi_x(\tau) + \theta\pi_x(\tau) + T(\tau),$$

and the home government's welfare from sector y as a function of the foreign import tariff is given by

$$v(\tau^*) \equiv \psi_y(\tau^*) + \pi_y(\tau^*).$$

Therefore, $W(\tau, \tau^*; \theta) = u(\tau;\theta) + v(\tau^*)$ represents the political welfare of the home government. The foreign country's welfare, $W^*(\tau^*, \tau; \theta^*)$, can be defined in a similar fashion.

This is obviously a highly stylized model in which different contingencies are measured by different values of a single parameter, namely, political pressure for protection. In reality, however, more tangible and concrete standards are used to assess the state of the world as it relates to the government's preferences for trade policy. For example, the escape clause of the GATT (Article XIX) defines an emergency situation as one in which

> " [a] product is being imported into the territory of [a] contracting party in such increased quantities and under such conditions as to cause or threaten serious injury to domestic producers in that territory..."

Although there is no mention of political pressures in this clause, the conditions of 'surge in imports' and 'serious injury' are usually associated with high protectionist pressure from the affected industries. For example, Sykes (1991, 2006) points

out that the declining industries are more likely to meet the two main conditions of the escape, i.e., a surge in imports and serious injury. On the other hand, Hillman (1982), Sykes (1991, 2006), and Baldwin and Robert-Nicoud (2007), show that declining industries are more interested and successful in lobbying the government for increased protection against imports. Therefore, one can argue that the escape clause is designed to allow the governments to dissipate occasional political pressures from particular industries.

2.3 Private Political Shocks

Recall that each country has two import-competing sectors. One of these sectors, called the political sector, is subject to random political shocks, i.e., the weight that the government gives to this sector may change over time. I assume that political pressure from the political sector can take two levels, i.e., low and high, denoted by $\underline{\theta}$ and $\overline{\theta}$ respectively. I further assume that the probability of high pressure from the political sector is given by ρ, where, $0 < \rho < 1$. The political parameter in the non-political import-competing sector is constant over time and for simplicity I assume it is equal to $\underline{\theta}$.

In what follows I assume that the governments use their retaliation rights in the non-political sector. This structure allows me to focus my analysis on the import tariffs of the home country in the political sector, and the retaliatory tariffs of the foreign country in the non-political sector. Due to symmetry, the foreign (home) country's import (retaliatory) tariffs are identical to those of the home (foreign) country. Therefore, in what follows I restrict my attention to the home country's import tariff in the political sector, denoted by τ, and the foreign country's retaliatory tariffs in the non-political sector, denoted by r.

3 Renegotiation without a DSB

To set a benchmark, I first consider tariff renegotiations between two countries with no access to a third party arbitrator such as DSB. The problem is to set a pair of

tariffs (τ, r), where τ denotes the home country's tariff in its political sector and r denotes the foreign country's tariff in its non-political sector. Since the realization of the political sector's pressure is private information of the domestic government, the problem of setting jointly optimal tariffs is best described as a bargaining problem under incomplete information.

I model this incomplete information bargaining problem as a direct revelation mechanism. Formally, before the realization of political pressure, parties agree on a mechanism that maximizes their expected joint welfare. At the beginning of a given period, political pressure is realized in the home country and is privately observed by the home government. The home government then announces its political pressure, and the mechanism determines the tariff rates of the home and the foreign countries.

The mechanism must be incentive compatible, meaning that the home government must have proper incentive to announce its political pressure truthfully. Denoting the home and foreign countries' tariffs as a function of the home announcement by $\tau(\theta)$ and $r(\theta)$, respectively, the incentive compatibility constraints are given by

$$W\left(\tau\left(\overline{\theta}\right), r\left(\overline{\theta}\right); \overline{\theta}\right) \geq W\left(\tau\left(\underline{\theta}\right), r\left(\underline{\theta}\right); \overline{\theta}\right), \tag{3}$$

and

$$W\left(\tau\left(\underline{\theta}\right), r\left(\underline{\theta}\right); \underline{\theta}\right) \geq W\left(\tau\left(\overline{\theta}\right), r\left(\overline{\theta}\right); \underline{\theta}\right). \tag{4}$$

The first inequality above implies that the home government is better off by announcing a high political pressure, when it actually faces a high pressure. Similarly, the second inequality ensures the home government's truthfulness at the time of a low political pressure.

The expected joint welfare of the governments is given by

$$\begin{array}{c} \rho\left[W\left(\tau\left(\overline{\theta}\right), r\left(\overline{\theta}\right); \overline{\theta}\right) + W^*\left(r\left(\overline{\theta}\right), \tau\left(\overline{\theta}\right); \underline{\theta}\right)\right] \\ + (1-\rho)\left[W\left(\tau\left(\underline{\theta}\right), r\left(\underline{\theta}\right); \underline{\theta}\right) + W^*\left(r\left(\underline{\theta}\right), \tau\left(\underline{\theta}\right); \underline{\theta}\right)\right] \end{array} \tag{5}$$

The first line of the above expression indicates the joint welfare of the governments when the home country faces a high political pressure, multiplied by the probability of a high political pressure in the home country. The second line gives the joint

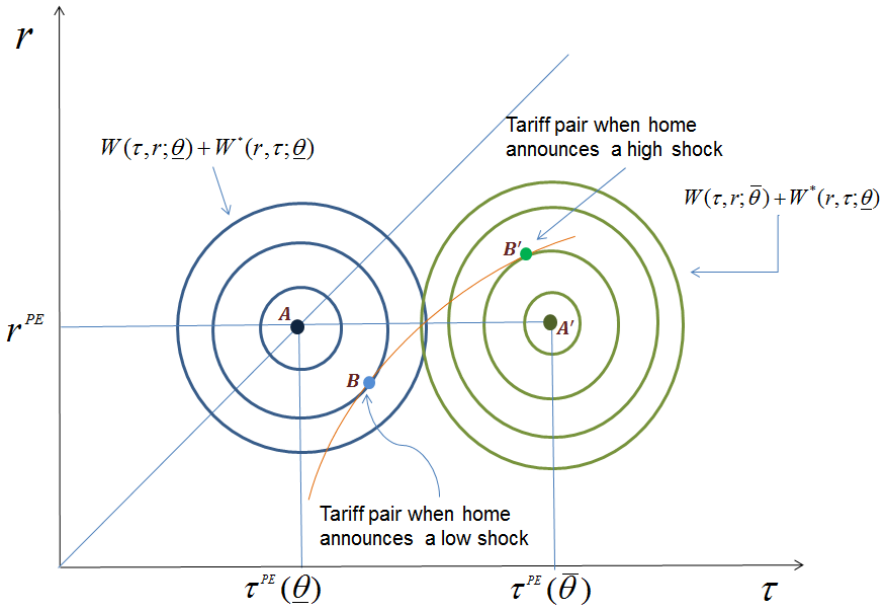

Figure 1: Equilibrium of the bargaining game (B and B') when there is no DSB.

welfare when political pressure is low, multiplied by the probability of a low shock.

An optimal mechanism is one that maximizes the expected joint welfare of the governments, (5), subject to the incentive compatibility constraints (3) and (4) . The optimal solution is shown graphically in Figure (1). In this figure, points A and A' represent the first-best tariff pairs under low and high political pressures, respectively. The circular curves centered around A (A') are the joint political welfare contours when political pressure at home is low (high). The outcome of the bargaining game is given by points B and B'. The curve that goes through B and B' is one of the home country's iso-welfare contours under low political pressure. This implies that when political pressure in the home country is low, the home government is indifferent between B and B'. Therefore, the tariff pair given by B will be implemented when the home country is facing low political pressure. On the other hand, B' will be the tariff pair implemented under high political pressure, as under such conditions the home government will be strictly better off at point B'.

It is worth noting that the optimal remedy rule for deviation from the agreement

tariff is different from the well-known 'liability rule' in the law and economics literature. Under the liability rule, an offending party has to compensate the injured party for its loss due to contract non-performance. However,

Proposition 1 *Under an optimal safeguard mechanism without cash transfer, the authorized retaliatory tariff is not high enough to compensate an exporting country for its loss due to the higher tariff in the safeguard-imposing country.*[10]

Studying the sensitivity of the optimal solution to the likelihood of high political pressure, ρ, is useful in obtaining a better intuition about the location of the optimal tariff schedule in Figure 1. As high shocks become more likely, the curve B-B' shifts towards A'. As a result of this shift, the tariff pair under high political pressure becomes more efficient (since B' will be closer to A'), while it becomes less efficient under low pressure (since B will be farther away from A). In an extreme case where $\rho = 1$, B' coincides with A', meaning that the tariff pair under high political pressure coincides with the first-best outcome. That is because when $\rho = 1$, there is no asymmetric information and the mechanism's outcome must be efficient. Similarly, when $\rho = 0$, B coincides with A.

4 Renegotiation under the auspices of the DSB

Following Beshkar (2010b), I assume that the DSB is an impartial entity that receives a noisy signal (through investigations or court hearings) about the state of the world in the defending country and announces this signal publicly.

As discussed in the introduction, assuming that the DSB has an informational role is broadly consistent with its mandate to make "objective assessment of the facts" of the dispute case and to make "recommendations" to help the disputing parties to develop a mutually satisfactory solution. Through objective assessment of the facts, the DSB can obtain a signal, albeit imperfect, about the underlying

[10] I reach a similar conclusion in Beshkar (2010a), where I study a symmetric agreement, and show that the principle of reciprocity in dispute settlement is at odds with an optimal safeguard mechanism.

political-economy conditions in the defending country. The recommendation of the DSB for a settlement, therefore, reflects the information that the DSB has obtained through its objective assessment.

It is important to note that assuming an informational role for the DSB does not imply any informational advantage on behalf of the DSB over the disputing parties. The advantage of the DSB over the disputing parties is its 'impartiality', which makes its public announcements about its privately observed signal reliable.

Formally, I assume that the DSB receives a signal of political pressure, denoted by θ_{DSB}, that matches the true state of the world with probability $\gamma > \frac{1}{2}$, i.e.,

$$\Pr\left(\theta_{DSB} = \underline{\theta} | \theta = \underline{\theta}\right) = \Pr\left(\theta_{DSB} = \overline{\theta} | \theta = \overline{\theta}\right) = \gamma.$$

As will be seen below, the public signal generated by DSB can improve the efficiency of the tariff bargaining by mitigating the information asymmetry between the trading partners.

4.1 Optimal Design

Similar to the previous section, here I consider the problem of designing an incentive-compatible direct revelation mechanism that maximizes expected joint welfare of the parties. The difference here is that in addition to the importing country's announcement about its realized political pressure, we also have the DSB's public announcement of its signal.

An assumption regarding the sequence of these announcements is consequential in the design of the optimal mechanism. In practice, the DSB rulings do not restrict the policy space of the defending country, meaning that a defending country is free to choose its policy, although it may face retaliation if it does not follow the DSB's ruling. Therefore, it is plausible to assume that the DSB's announcement precedes that of the defending country. Moreover, in this section I assume that DSB gets involved in the dispute and makes its announcement automatically, i.e., without a request from the parties. I will relax this assumption in Section 6, where I study pre-trial settlement negotiations.

The sequence of events is as follows:

1. Parties commit to a mechanism.

2. Political pressure, θ, in the home country is realized and observed privately by the home government.

3. DSB receives a noisy signal, denoted by θ_{DSB}, about the political pressure in the home country and announces it publicly.

4. Home government makes an announcement, denoted by θ_d, about its political pressure.

5. The mechanism determines the tariff pair (τ, r) to be adopted by the parties.

Note that the DSB's announcement together with the home (i.e., defending) country's announcement determine the outcome of the mechanism. Therefore, the optimal solution is summarized by two entries, namely, $\tau\left(\theta_d, \theta_{DSB}\right)$ and $r\left(\theta_d, \theta_{DSB}\right)$.

There are four incentive compatibility constraints that must be satisfied. First, suppose that the home country is facing a high political pressure and the DSB has also observed a signal of high political pressure, i.e., $\theta_{DSB} = \overline{\theta}$. The home government will report its type truthfully if and only if:

$$W\left(\tau\left(\overline{\theta}, \overline{\theta}\right), r\left(\overline{\theta}, \overline{\theta}\right); \overline{\theta}\right) \geq W\left(\tau\left(\underline{\theta}, \overline{\theta}\right), r\left(\underline{\theta}, \overline{\theta}\right); \overline{\theta}\right). \tag{6}$$

If the true state of the world is $\theta = \underline{\theta}$, but the DSB's signal shows a high political pressure, the home government will have the incentive to report a low political pressure if and only if:

$$W\left(\tau\left(\underline{\theta}, \overline{\theta}\right), r\left(\underline{\theta}, \overline{\theta}\right); \underline{\theta}\right) \geq W\left(\tau\left(\overline{\theta}, \overline{\theta}\right), r\left(\overline{\theta}, \overline{\theta}\right); \underline{\theta}\right). \tag{7}$$

The remaining two incentive compatibility constraints are for situations where the DSB receives a signal of low political pressure. If this signal matches the true state of the world, then the incentive compatibility constraint is given by

$$W\left(\tau\left(\underline{\theta}, \underline{\theta}\right), r\left(\underline{\theta}, \underline{\theta}\right); \underline{\theta}\right) \geq W\left(\tau\left(\overline{\theta}, \underline{\theta}\right), r\left(\overline{\theta}, \underline{\theta}\right); \underline{\theta}\right). \tag{8}$$

Finally, if the DSB's signal of low political pressure differs from the true state of the

world, the home government has the incentive to report its high political pressure truthfully if and only if

$$W\left(\tau\left(\overline{\theta},\underline{\theta}\right),r\left(\overline{\theta},\underline{\theta}\right);\overline{\theta}\right)\geq W\left(\tau\left(\underline{\theta},\underline{\theta}\right),r\left(\underline{\theta},\underline{\theta}\right);\overline{\theta}\right). \tag{9}$$

The expected joint welfare of the governments, which will be used as to measure the mechanism's performance, can be introduced as follows.[11] First, consider a situation where the home country is under high political pressure. With probability γ, the DSB observes a signal of high political pressure and with probability $1-\gamma$, the DSB observes a low-pressure signal. Thus, given high political pressure in the home country, the expected joint welfare is

$$\begin{aligned}&\gamma\left[W\left(\tau\left(\overline{\theta},\overline{\theta}\right),r\left(\overline{\theta},\overline{\theta}\right);\overline{\theta}\right)+W^{*}\left(r\left(\overline{\theta},\overline{\theta}\right),\tau\left(\overline{\theta},\overline{\theta}\right);\underline{\theta}\right)\right]\\+&\left(1-\gamma\right)\left[W\left(\tau\left(\overline{\theta},\underline{\theta}\right),r\left(\overline{\theta},\underline{\theta}\right);\overline{\theta}\right)+W^{*}\left(r\left(\overline{\theta},\underline{\theta}\right),\tau\left(\overline{\theta},\underline{\theta}\right);\underline{\theta}\right)\right].\end{aligned}$$

Now consider the case where the home government is facing low political pressure. The DSB's signal in this case will be a low political pressure with probability γ, and a high political pressure with probability $1-\gamma$. Therefore the expected joint welfare under low political pressure is

$$\begin{aligned}&\gamma\left[W\left(\tau\left(\underline{\theta},\underline{\theta}\right),r\left(\underline{\theta},\underline{\theta}\right);\underline{\theta}\right)+W^{*}\left(r\left(\underline{\theta},\underline{\theta}\right),\tau\left(\underline{\theta},\underline{\theta}\right);\underline{\theta}\right)\right]\\+&\left(1-\gamma\right)\left[W\left(\tau\left(\underline{\theta},\overline{\theta}\right),r\left(\underline{\theta},\overline{\theta}\right);\underline{\theta}\right)+W^{*}\left(r\left(\underline{\theta},\overline{\theta}\right),\tau\left(\underline{\theta},\overline{\theta}\right);\underline{\theta}\right)\right].\end{aligned}$$

The first case above, i.e., a high political pressure, is realized with probability ρ and the second case occurs with probability $1-\rho$. Thus, ex ante, that is, before the realization of the state of the world, the expected joint welfare of the governments is

[11] Given our focus on countries that are ex ante symmetric, it is plausible to consider the expected joint welfare as the measure of the mechanism's performance.

given by

$$\begin{aligned}
&\rho\gamma\left[W\left(\tau\left(\overline{\theta},\overline{\theta}\right),r\left(\overline{\theta},\overline{\theta}\right);\overline{\theta}\right)+W^{*}\left(r\left(\overline{\theta},\overline{\theta}\right),\tau\left(\overline{\theta},\overline{\theta}\right);\underline{\theta}\right)\right]\\
&+\rho\left(1-\gamma\right)\left[W\left(\tau\left(\overline{\theta},\underline{\theta}\right),r\left(\overline{\theta},\underline{\theta}\right);\overline{\theta}\right)+W^{*}\left(r\left(\overline{\theta},\underline{\theta}\right),\tau\left(\overline{\theta},\underline{\theta}\right);\underline{\theta}\right)\right]\\
&+\left(1-\rho\right)\left(1-\gamma\right)\left[W\left(\tau\left(\underline{\theta},\overline{\theta}\right),r\left(\underline{\theta},\overline{\theta}\right);\underline{\theta}\right)+W^{*}\left(r\left(\underline{\theta},\overline{\theta}\right),\tau\left(\underline{\theta},\overline{\theta}\right);\underline{\theta}\right)\right]\\
&+\left(1-\rho\right)\gamma\left[W\left(\tau\left(\underline{\theta},\underline{\theta}\right),r\left(\underline{\theta},\underline{\theta}\right);\underline{\theta}\right)+W^{*}\left(r\left(\underline{\theta},\underline{\theta}\right),\tau\left(\underline{\theta},\underline{\theta}\right);\underline{\theta}\right)\right].
\end{aligned}\tag{10}$$

The problem of designing a direct revelation bargaining mechanism will be to maximize (10) subject to incentive compatibility constraints $(6-9)$.[12] The optimal solution can be demonstrated by four tariff pairs, namely, L, L', H, and H', depicted in Figure (2). The curves going through H-H' and L-L' are two iso-welfare contours of the home country under low political pressure.

If $\theta_{DSB}=\overline{\theta}$, then the equilibrium tariff pair is either H or H', depending on the home country's true state of the world. Under low political pressure, the home country will be indifferent between H and H', and I assume that it will choose H to maximize the joint welfare of the governments. Under high pressure, however, the home country will be strictly better off at H' than H, so it will announce a high political pressure and H' will be the outcome of the bargaining game.

If the DSB observes a low pressure signal, i.e., $\theta_{DSB}=\underline{\theta}$, then the equilibrium tariff pair is either L or L'. Similar to the previous case, the home country is indifferent between L and L' when it faces low political pressure and I assume it will choose L so that the joint welfare is maximized. Moreover, if the home country faces high pressure, it will be strictly better off by announcing a high pressure that results in adopting tariff pair L'.

The DSB's announcements can be interpreted as having a "framing effect" on renegotiations. If the DSB rules in favor of the home country by stating that the home country is facing high political pressure, the subsequent bargaining game between

[12] Although not modeled explicitly, it is assumed that the entire mechanism introduced in this paper is sustainable through repeated interactions between the parties. In other words, parties have the incentive to respect the rules of negotiations (such as limiting retaliations to what is specified by the mechanism) in order to guarantee a sustainable relationship in the long run. Interested readers are referred to Beshkar (2010b) and Park (2011) for the study of the DSB in a repeated game setting.

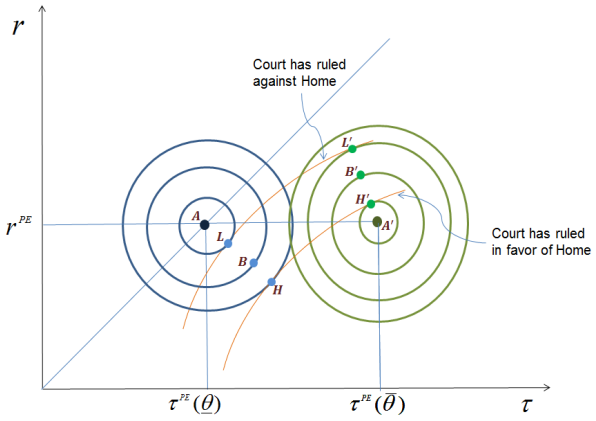

Figure 2: Equilibrium of the DSB-assisted bargaining game (L, L', H, and H').

the governments is to mutually agree on either H or H'. In contrast, if the DSB announces a low political pressure in the home country, the governments bargain over L and L'. Loosely speaking, the defending party (here the home country) will have the upper hand in renegotiations if the DSB issues an opinion favorable to the defendant. Similarly, if the DSB's opinion is against the defending party, the complaining party will be in a better bargaining position.

To understand the source of welfare gain from introducing the DSB, compare the equilibrium outcomes when there is no DSB, given by B and B', and the equilibrium outcomes under the DSB, given by H, H', L, and L'. First, consider a situation where the home country is facing a high political pressure. In this case, bargaining without the help of the DSB results in tariff pair B'. But in the presence of the DSB, there is a high chance (i.e., $\gamma > 1/2$) that H' will be chosen by parties, which is associated with a higher joint welfare. The downside of the bargaining under the DSB is that with a low probability $(1-\gamma)$, the DSB may make a wrong judgment that results in the less efficient tariff pair L'. But the expected joint welfare will be higher under the DSB as long as the DSB's signal is informative (i.e., $\gamma > 1/2$). The same story is true when the home country is facing a low political pressure. In that case, in absence of the DSB, the bargaining outcome is given by B, while in the presence of the DSB the bargaining outcome may be at L with probability $\gamma > 1/2$.

In summary, applied tariffs are on average more efficient under the auspices of the DSB. Moreover,

Proposition 2 *The introduction of the DSB reduces (increases) the expected level of protection in the political sector when* $\theta = \underline{\theta}$ *(*$\theta = \overline{\theta}$*).*

4.2 Comparative Statics

As DSB's signal becomes more accurate, that is when γ becomes closer to 1, $H - H'$ will shift to the right and down and $L - L'$ will shift to the left and up. That is because as the DSB becomes more accurate in observing the true state of the world, the cost of making a wrong judgment becomes less of a concern and the DSB can be more aggressive in its rulings in favor or against the home country. In the extreme case of $\gamma = 1$, L will coincide with A, while H' will coincide with A', meaning that bargaining results in the first-best outcome.

For a given value of γ, an increase in ρ moves both $H - H'$ and $L - L'$ to the right and down. The shift of $L - L'$ to the right and down reflects the fact that when a high pressure is more likely, the DSB wants to reduce the cost of wrong rulings when the true pressure is high. Moreover, $H - H'$ shifts in the same direction because the probability of low pressure is now smaller and the expected cost of a wrong judgment when a high pressure signal is observed is reduced. When $\rho = 1$, there will be no asymmetric information and A', H', and L' will coincide.

5 Implementation of the Optimal Mechanism

The previous section laid out a 'direct' revelation mechanism in which the bargaining outcome is uniquely determined by the respective announcements of the court and the defending party. As is well-known in the mechanism design literature, the outcome of a direct revelation mechanism may be obtained through other institutional designs. My objective in this section is to offer an institutional design that resembles the actual dispute settlement process of the WTO while replicating the same outcome as the direct mechanism found above.

According to the direct mechanism of Section 4, the defending country has to choose one of the two tariff pairs that are recommended by the DSB. In practice, however, the DSB cannot restrict the defending party's choice of import tariffs. The DSB can only determine the complaining party's permissible retaliatory tariff given the defending party's tariff.[13]

In the light of this real world observation, in this section I consider a mechanism in which the defending country's tariff choice is not restricted, but the DSB can impose a cap on the maximum level of retaliation by the complaining party. As I show below, however, this alternative mechanism generates the same second-best outcome calculated in Section 4.

Figure 3 depicts this alternative mechanism graphically. Point L in this figure is the agreement tariff pair for normal (i.e., low political pressure) situations. A DSB investigation of the state of the world is initiated when the defending party proposes an import tariff that violates this initial agreement, i.e., $\tau > \tau_L$. If the DSB receives a low-pressure signal, it will recommend the defending party to respect the negotiated tariff bindings and reduce its tariff to τ_L. If the defendant insists on the necessity of increased protection, then the complaining party will be authorized to retaliate according to Menu H.

Menu H is the upper envelope of the home iso-welfare contours under low and high political pressures that go through point L'. Under this retaliation scheme, the home government would respect the recommendation of the DSB if it faces a low political pressure and will choose point L' if it faces a high political pressure. Note that under Menu H the home government is indifferent between choosing the tariff rate associated with L' or higher tariffs if it is under high pressure.

If the DSB observes a high political pressure, it will authorize a limited deviation from the agreement tariff, that is, and increase from τ_L to τ_S. In this case if the defending party wants to impose a tariff higher than τ_S, the complaining party will be authorized to retaliate using the menu H. As shown in Figure 3, Menu H is

[13]Here we can plausibly assume that the complaining party will not retaliate beyond the level that is permitted by the court. That is because any incentive to adopt extra-legal retaliation can be eliminated by authorizing more protection in the original defending country along the appropriate tariff-pair menus.

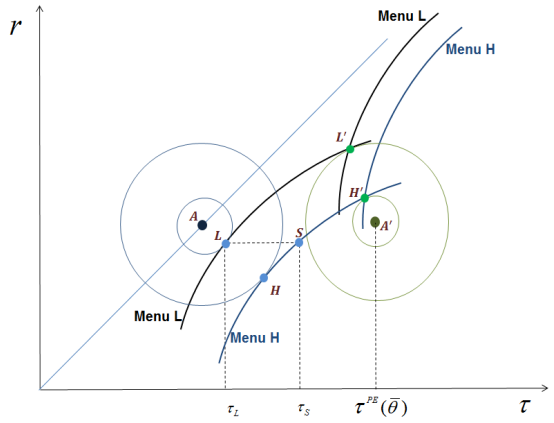

Figure 3: Tariff pair L (tariff pair S) is the reference point determined by the DSB when a low-pressure (high-pressure) signal is observed. Moreover, the renegotiation rule is given by the punishment menu L (menu H).

the upper envelope of the home iso-welfare contours under low and high political pressures that go through point H'.

Menu H also provides a basis for the complaining party to offer a reduction in its own tariffs to induce the defending party who faces low pressure to choose point H. Whether this second best outcome is implementable depends on the constraints that negotiators face. For example, if the negotiators of the exporting country do not have the discretion to offer a reduction in their import tariffs, tariff pair H may never be chosen, in which case the outcome will be the tariff pair S.

The optimal 'implementable' mechanism can be summarized as follows:

Summary 1 *The optimal tariff agreement assigns a normal tariff, τ_L, and a safeguard tariff, $\tau_S > \tau_L$, for the political sector. The optimal DSB recommends τ_L (τ_S) if it observes a low (high) political pressure signal. Moreover, if the defending party applies a tariff higher than the DSB's recommendation, the complaining party will be authorized to retaliate according to the retaliation menu L (H), if the DSB's recommendation is τ_L (τ_S).*

5.1 The DSB's Biased Ruling Pattern

The data on the official rulings of the DSB reveals a high disparity between the success rates of the complaining and defending parties. As reported by Colares (2009), the DSB rules against the defending party in more than 88 percent of cases where the subject of dispute is related to trade remedies.[14] In some categories of disputes this disparity is even more dramatic. For example, in litigations regarding the safeguard measures adopted to protect domestic industries against potentially harmful surge in imports, the DSB has always ruled against the defending party (Sykes 2003).

Some observers have interpreted this pro-complainant ruling pattern as unsatisfactory. For example, Sykes (2003) and Grossman and Sykes (2007) argue that the DSB's interpretation of the WTO Agreement has made it increasingly difficult for the governments to resort to the escape clause, which frustrates the purpose of the WTO Agreement on Safeguards. Colares (2009) attributes the DSB's bias to the normative views of the individuals who are involved in the DSB and argues that the asymmetrical pattern of the DSB's ruling is "the result of a process of authoritative normative evolution (i.e., rule development) that has expressed itself with a tilt favoring complainants."

The results of this paper, however, suggest that the seemingly biased rulings of the DSB may be part of an optimal dispute settlement mechanism. For example, consider a situation where the DSB finds (imperfect) evidence in favor of the defending country, i.e., $\theta_{DSB} = \overline{\theta}$. In this case, the DSB's optimal ruling is to allow the defending country to increase its tariff to τ_S with impunity, while advising retaliation along menu H in case $\tau > \tau_S$. On the other hand, the defending country will prefer to set $\tau = \tau_{H'} > \tau_S$ and face retaliation if it is truly facing a high protectionist pressure. Therefore, even if the DSB finds evidence in favor of the defendant, it is optimal to rule against the defending party by recommending a tariff reduction or authorizing retaliation.

To reach a general theoretical conclusion about the disparity between the success

[14] For non-trade remedy cases this rate is 83.33%.

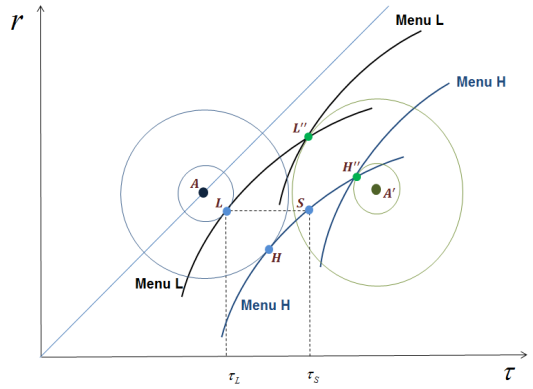

Figure 4: An optimal renegotiation-proof mechanism.

rate of the defending and complaining parties we need to compare the disputed tariff level (i.e., the proposed safeguard tariff) with the DSB's recommended tariff. In our simple model, the DSB's ruling is either τ_L or τ_S with corresponding retaliation menus L and H, respectively.

As for the size of the disputed tariff, let τ^d denote the defending party's proposed tariff that has initiated a dispute (i.e., $\tau^d > \tau_L$). Our model so far does not explicitly determine the size of the disputed tariff, but

Lemma 1 *If by announcing a safeguard tariff, τ^d, the defending party commits not to apply a tariff greater than τ^d, then a country with $\theta = \overline{\theta}$ will not propose a safeguard tariff smaller than $\tau_{H'}$.*

Therefore, since $\tau^d < \tau_{H'}$ indicates low political pressure in the defending country, it is plausible to assume that regardless of its political pressure parameter, the safeguard-imposing country proposes a sufficiently high safeguard tariff, i.e., $\tau^d \geq \tau_{H'}$.

Since $\tau^d \geq \tau_{H'} > \tau_S > \tau_L$, it is clear that the DSB's recommended tariff (which can be τ_S or τ_L depending on the DSB's observed signal) is always less than the disputed tariff. Therefore,

Proposition 3 *Under an optimal dispute settlement mechanism, the DSB always*

rules against the defending party by recommending a cut in the defendant's proposed tariff.

If $\theta = \underline{\theta}$, the defending party accepts the DSB's recommendation, whether the DSB's recommendation is τ_L or τ_S, and avoids retaliation. On the other hand, when $\theta = \overline{\theta}$, the defending party does not accept the DSB's recommendation and faces retaliation from the complaining party. Therefore,

Proposition 4 *The defending country complies with the DSB recommendations if and only if it faces a low political pressure.*

5.2 Renegotiation Proofness

The mechanism introduced above maximizes the ex ante joint welfare of the parties subject to incentive constraints. However, ex post, this mechanism does not generate a Pareto optimal result if the true state of the world is $\theta = \overline{\theta}$.[15] To see this, note that if $\theta = \overline{\theta}$, the iso-welfare contour of the home country will not be tangent to the iso-joint-welfare contours at points H' and L' in Figure 3. This implies that if the mechanism generates either of these tariff pairs, the parties have the incentive to renegotiate away from the suggested tariff pair. Therefore, if the parties cannot commit not to renegotiate the outcome of the mechanism, this mechanism cannot be implemented as designed.

It is, however, easy to modify the above mechanism to ensure that its outcome is renegotiation-proof under all states of the world. In particular, one can restrict the choice of tariff pairs to the set of Pareto optimal tariff pairs under the realized political pressure. Figure 4 depicts the optimal renegotiation-proof mechanism. As can be seen in this figure, tariff pairs L'' and H'' are now Pareto optimal since at these points the iso-welfare curve of the home country under high pressure is tangent to the iso-joint-welfare contours under high pressure. Obviously, requiring the mechanism to be renegotiation-proof reduces the ex ante expected joint welfare of the parties.

[15] The ex-post result is Pareto optimal if the true state of the world is $\theta = \underline{\theta}$.

However, the comparative statics in this case is qualitatively similar to the case without the renegotiation-proofness requirement.

6 Pretrial Settlement Bargaining

So far I have focused on post-trial negotiations in the WTO and interpreted such negotiations as part of an optimal dispute resolution mechanism. In this section I complete the above model by allowing for pre-trial settlement negotiations.

Since the joint welfare of the disputing parties is a concave function and the DSB rulings are uncertain, the disputing parties have a collective incentive to find a settlement without resorting to DSB arbitration.[16] This incentive to settle is in addition to the desire to avoid the transaction cost of litigation, which may include attorney fees, cost of gathering information, etc.

In order to highlight the effect of uncertain DSB outcome on the pattern of dispute settlement, I assume zero litigation costs and investigate whether an exporting country would invoke a formal dispute after observing any positive level of violation.[17] That is, whether an exporting country is willing to show tolerance to relatively minor violations of the agreement by importing countries. If the answer to this question is affirmative then the relevant question is whether importing countries would show enough restraint in the use of trade barriers so that the exporting countries would tolerate it.

I study the following pre-trial negotiation game. Assume that after the realization of the state of the world, the importing country (henceforth, M) proposes a tariff pair $t = (\tau, r)$, where τ denotes the importing country's tariff in the political sector and r denotes the exporting country's retaliatory tariff. If the exporting country (henceforth, X) accepts this proposal, there will be no litigation. Otherwise, the

[16] Viscusi (1988) also studies the effect of risk aversion in product liability disputes on the outcome of settlement negotiations but in a symmetric information setting.

[17] De-emphasizing the role of litigation costs may be appealing to many observers of the WTO who consider the litigation costs to be small compared to the size of the stake at dispute in many WTO disputes.

dispute escalates to the DSB and the game will continue as described in Section 5. Namely, if the DSB rules against the importing country, the resulting tariff pair will be either L or L' in Figure 3 (depending on the true type of the importing country); and if the DSB rules against the importing country, the resulting tariff pair will be either H or H'.

This is a signaling game in which the importing country (i.e., the defendant) is the *sender* and the exporting country (i.e., the complainant) is the *receiver*. The proposed tariff pair, t, will be understood as a signal of the importing country's type (i.e., level of political pressure) and the threat of litigation is the cost that is associated with this signal. The following is the list of new notations that will be employed in the analysis of this signaling game:

$W^X(t):$	Exporting country's welfare under tariff pair t.
$W^M(t;\theta):$	Importing country's welfare under tariff pair t and political pressure θ.
$W(t;\theta):$	Joint welfare: $W^M(t;\theta) + W^X(t)$.
$P_\theta:$	Set of Pareto efficient tariffs when political pressure is $\theta \in \left\{\underline{\theta}, \overline{\theta}\right\}$.

I consider hybrid equilibria of this signaling game, which include pooling and separating equilibria as special cases. In a hybrid equilibrium, a high-type importing country has a pure strategy in the equilibrium, which I denote by t_h. On the other hand, the strategy of a low-type importing country is to randomize between t_l and t_h, where $t_l \leq t_h$. Let α denote the probability that a low-type importing country proposes t_h instead of t_l.[18] The exporting country's equilibrium strategy will be to accept a settlement proposal when $t = t_l$ and to reject $t = t_h$ with probability β.

The quadruplet $(t_l, t_h, \alpha, \beta)$ is a Perfect Bayesian Equilibrium if and only if:

1. When $\theta = \underline{\theta}$,

   (a) M prefers to settle at t_l than to litigate, i.e.,

$$W^M(t_l;\underline{\theta}) \geq \gamma W^M(t_L;\underline{\theta}) + (1-\gamma) W^M(t_H;\underline{\theta}). \tag{11}$$

[18] Note that $\alpha = 0$ would indicate a separating equilibrium.

(b) M is indifferent between proposing t_l and t_h, i.e.,

$$W^M(t_l;\underline{\theta}) = (1-\beta)\,W^M(t_h;\underline{\theta}) + \beta\left[\gamma W^M(t_L;\underline{\theta}) + (1-\gamma)\,W^M(t_H;\underline{\theta})\right]. \tag{12}$$

2. When $\theta = \overline{\theta}$, M (weakly) prefers to settle at t_h than to litigate, i.e.,

$$W^M\left(t_h;\overline{\theta}\right) \geq \gamma W^M\left(t_{H'};\overline{\theta}\right) + (1-\gamma)\,W^M\left(t_{L'};\overline{\theta}\right). \tag{13}$$

3. X (weakly) prefers settlement to litigation when t_l is proposed, i.e.,

$$W^X(t_l) \geqslant \gamma W^X(t_L) + (1-\gamma)\,W^X(t_H). \tag{14}$$

4. X is indifferent between settlement and litigation when t_h is proposed, i.e.,

$$\begin{aligned} W^X(t_h) &= \frac{\alpha(1-\rho)}{\alpha(1-\rho)+\rho}\left[\gamma W^X(t_L) + (1-\gamma)\,W^X(t_H)\right] \\ &\quad + \frac{\rho}{\alpha(1-\rho)+\rho}\left[\gamma W^X(t_{H'}) + (1-\gamma)\,W^X(t_{L'})\right]. \end{aligned} \tag{15}$$

5. $0 \leq \alpha \leq 1$ and $0 \leq \beta \leq 1$.

There are additional conditions that a reasonable equilibrium should satisfy. First, when $\theta = \underline{\theta}$ and M decides to reveal its type truthfully, it will propose t_l to maximize its payoff subject to conditions 11 and 14. This maximization problem has a unique solution, which makes X indifferent between settlement and litigation (see Lemma 2 in the Appendix). Therefore, the equilibrium value of t_l, denoted by t_l^* is uniquely determined by[19]

$$\begin{aligned} W^X(t_l^*) &= \gamma W^X(t_L) + (1-\gamma)\,W^X(t_H), \\ \text{and } t_l^* &\in P_{\underline{\theta}}. \end{aligned} \tag{16}$$

[19] Therefore a low-type M is always in violation of the agreement even if it 'separates' itself from the high type by proposing $t = t_l$. That is because according to the trade agreement, t_D, which generates a higher payoff than t_l for X, is the tariff pair that must be chosen when political pressure is low in M.

I further require an equilibrium to be *renegotiation proof* in the following sense. An equilibrium of the pre-trial settlement game is renegotiation proof if after receiving the settlement proposal of the importing country, the exporting country cannot make a credible counter-offer that is acceptable to both countries. It can be shown that a PBE is renegotiation proof only if $t_h \in P_{\overline{\theta}}$ and M is indifferent between settlement and litigation when $\theta = \overline{\theta}$. To see this consider a PBE in which M strictly prefers settlement to litigation, i.e., the equilibrium condition 13 holds with strict inequality. Now imagine M making the following counter offer when X offers t_h:

> *I will accept to settle if and only if X modifies its proposal to* $t'_h \in P_{\overline{\theta}}$ *such that* $W^X(t'_h) > W^X(t_h)$ *and* $W^M\left(t'_h; \overline{\theta}\right) > \gamma W^M\left(t_{H'}; \overline{\theta}\right) + (1-\gamma) W^M(t_{L'}; \underline{\theta})$.

Note that since t_h makes X indifferent between settlement and litigation, its threat of litigation is credible. Moreover, t'_h is an acceptable settlement proposal to M as it prefers to settle at t'_h than to litigate. As a result, renegotiation proofness requires a high-type M to be indifferent between settlement and litigation, which implies that the equilibrium condition 13 must hold with equality. Therefore, the equilibrium value of t_h, denoted by t^*_h, is uniquely determined by the following conditions:

$$\begin{aligned} W^M\left(t^*_h; \overline{\theta}\right) &= \gamma W^M\left(t_{H'}; \overline{\theta}\right) + (1-\gamma) W^M\left(t_{L'}; \overline{\theta}\right), \\ \text{and } t^*_h &\in P_{\overline{\theta}}. \end{aligned} \tag{17}$$

Proposition 5 *The pre-trial settlement bargaining game has a unique renegotiation-proof Perfect Bayesian Equilibrium, which is strictly hybrid, i.e.,* $t^*_l \neq t^*_h$, $0 < \alpha^* < 1$, *and* $0 < \beta^* < 1$.

Proof. As discussed above, in a renegotiation-proof PBE, t^*_l and t^*_h are uniquely determined by conditions 16 and 17. Moreover, given t^*_l and t^*_h, α^* and β^* are uniquely determined by conditions 12 and 14. To prove the proposition, it is then sufficient to show that $0 < \alpha^* < 1$, and $0 < \beta^* < 1$.

To show that $\alpha^* < 1$, it is sufficient to show that

$$\begin{aligned} W^X(t_h^*) &< (1-\rho)\left[\gamma W^X(t_L) + (1-\gamma) W^X(t_H)\right] \\ &\quad +\rho\left[\gamma W^X(t_{H'}) + (1-\gamma) W^X(t_{L'})\right]. \end{aligned} \tag{18}$$

Noting that $W^M(t_h^*;\underline{\theta}) > \gamma W^M(t_L;\underline{\theta}) + (1-\gamma) W^M(t_H;\underline{\theta})$ (that is, a low-type M prefers to settle at t_h^* than to litigate), and that $W^M\left(t_h^*;\overline{\theta}\right) = \gamma W^M\left(t_{H'};\overline{\theta}\right) + (1-\gamma) W^M\left(t_{L'};\overline{\theta}\right)$, a sufficient condition for 18 to hold is

$$\begin{aligned} & W^X(t_h^*) + (1-\rho) W^M(t_h^*;\underline{\theta}) + \rho W^M\left(t_h^*;\overline{\theta}\right) \\ < \; & (1-\rho)\left[\gamma W(t_L;\underline{\theta}) + (1-\gamma) W^X(t_H;\underline{\theta})\right] \\ & +\rho\left[\gamma W^X\left(t_{H'};\overline{\theta}\right) + (1-\gamma) W^X\left(t_{L'};\overline{\theta}\right)\right]. \end{aligned}$$

The right-hand side of this inequality represents the expected joint payoff from using the DSB without the possibility of pre-trial settlement. The left-hand side of this inequality is the expected joint payoff of the parties if they always settle at t_h^*. In other words, the left-hand side represents the joint welfare from a rigid agreement to adopt the tariff pair t_h^*. But as was shown in Sections 4 and 5, if the DSB is designed optimally it outperforms a rigid agreement. Thus, inequality 18 holds and $\alpha < 1$ in equilibrium.

$\alpha = 0$ cannot be an equilibrium since it implies that $\beta = 0$, which in turn implies that $\alpha = 1$. To see why $\alpha = 0$ implies $\beta = 0$, note that when $\alpha = 0$, M proposes $t = t_h^*$ only if $\theta = \overline{\theta}$. On the other hand, X is strictly better off by accepting the settlement proposal $t = t_h^*$ when it believes that M's type is $\overline{\theta}$. Therefore, $\beta = 0$. Now to see why $\beta = 0$ implies $\alpha = 1$, note that $\beta = 0$ means that X would accept a settlement proposal of $t = t_h^*$. But since $W^M(t_h^*;\underline{\theta}) > W^M(t_l^*;\underline{\theta})$, a low type would mimic the high type, i.e., $\alpha = 1$.

Solve condition 12 for β^* to see that $0 < \beta^* < 1$ iff

$$0 < \frac{W^M(t_h^*;\underline{\theta}) - W^M(t_l^*;\underline{\theta})}{W^M(t_h^*;\underline{\theta}) - \gamma W^M(t_L;\underline{\theta}) - (1-\gamma) W^M(t_H;\underline{\theta})} < 1.$$

The numerator is positive because M enjoys a higher payoff under t_h^* than the t_l^*. The denominator is also positive because a low-type M enjoys a higher payoff from settlement with t_h^* than from litigation. Therefore, the first inequality holds. To show that the second inequality holds, it is sufficient to show that

$$W^M\left(t_l^*;\underline{\theta}\right) > \gamma W^M\left(t_L;\underline{\theta}\right) + \left(1-\gamma\right) W^M\left(t_H;\underline{\theta}\right),$$

which is satisfied by Lemma 2 (see the Appendix). ■

This model predicts that in each period the fraction of tariff lines that are subject to a dispute is given by $\left(1-\rho\right)\alpha^* + \rho$, from which only a fraction, β^*, are litigated. Moreover, settlement bargaining affects the combination of cases that reach the formal trial. In particular, in a dispute that is brought before the DSB, the probability that the disputed measure is legitimate is given by $\frac{\rho\beta^*}{\rho\beta^*+(1-\rho)\alpha^*\beta^*}$ or simply $\frac{\rho}{\rho+(1-\rho)\alpha^*} > \rho$. Thus,

Proposition 6 *Allowing for pretrial settlement negotiations decreases the percentage of purely protectionist proposals (i.e., safeguard proposals when $\theta = \underline{\theta}$) in the combination of cases that are brought before the DSB for arbitration.*

6.1 Effect of pretrial negotiations on the optimal DSB ruling

In this subsection, I close the model by characterizing the optimal DSB ruling when the pre-trial settlement negotiation is taken into account. The negotiators' problem is to maximize the expected joint welfare of the parties before the realization of the state of the world.

First note that the incentive compatibility constraints dictate the same structure of the DSB mechanism as in the case where there is no DSB. That is, the outcome of litigation is one of four tariff pairs denoted by t_H, $t_{H'}$, t_L, and $t_{L'}$, which are located on the tariff menus L and H (see Figure 5 and Summary 1).

However, the objective of the negotiators at the time of designing the agreement, and hence the optimal location of menus L and H, is affected by the introduction of pre-trial settlement negotiations to the system. Consider the welfare of the importing

country. If the importing country faces a low political pressure, which will happen with probability $1-\rho$, it will have an expected welfare of $W^M(t_l;\underline{\theta})$. Also, the importing country will face a high political pressure with probability ρ, in which case it will have an (expected) welfare of $W^M\left(t_h;\overline{\theta}\right)$. Therefore, ex ante, the expected welfare of the importing country is $\rho W^M\left(t_h;\overline{\theta}\right)+(1-\rho)W^M(t_l;\underline{\theta})$.

Now I turn to calculating the ex ante welfare of the exporting country. Proposition 5 implies that in the equilibrium of the pretrial settlement negotiation, the exporting country is indifferent between settlement and litigation whether the settlement offer is t_l or t_h. This means that in order to calculate the exporting country's ex ante welfare we can assume that no settlement occurs and all cases are litigated. As a result, the exporting country's welfare can be written as

$$(1-\rho)\left[\gamma W^X(t_L)+(1-\gamma)W^X(t_H)\right]+\rho\left[\gamma W^X(t_{H'})+(1-\gamma)W^X(t_{L'})\right],$$

where, t_H, $t_{H'}$, t_L, and $t_{L'}$ are the potential outcomes of the post-trial negotiation.

Therefore, the ex ante joint welfare of the parties can be written as

$$\begin{aligned}&\rho W^M\left(t_h;\overline{\theta}\right)+(1-\rho)W^M(t_l;\underline{\theta})\\&+(1-\rho)\left[\gamma W^X(t_L)+(1-\gamma)W^X(t_H)\right]\\&+\rho\left[\gamma W^X(t_{H'})+(1-\gamma)W^X(t_{L'})\right].\end{aligned}\tag{19}$$

The optimal design of the agreement is thus obtained by maximizing 19 subject to the incentive compatibility constraints $(6-9)$ and the equilibrium conditions of the pre-trial equilibrium:

$$W^X(t_l)=\gamma W^X(t_L)+(1-\gamma)W^X(t_H),\tag{20}$$

$$W^M\left(t_h;\overline{\theta}\right)=\gamma W^M\left(t_{H'};\overline{\theta}\right)+(1-\gamma)W^M\left(t_{L'};\overline{\theta}\right).\tag{21}$$

The following Proposition states the changes in the optimal design of the agreement that is caused by the introduction of pre-trial settlement.

Proposition 7 *Allowing for pretrial settlement negotiations 1) increases the effi-*

ciency of the optimal agreement tariff pair, t_L, for normal times; and 2) increases the punishment-free level of deviation from the agreement (i.e., $\tau_S - \tau_L$) that may be authorized by the DSB.

Proof. Adding and subtracting $\rho\left[\gamma W^M\left(t_{H'};\overline{\theta}\right) + (1-\gamma)W^M\left(t_{L'};\overline{\theta}\right)\right]$ and $(1-\rho)$ $\left[\gamma W^M\left(t_L;\underline{\theta}\right) + (1-\gamma)W^M\left(t_H;\underline{\theta}\right)\right]$ from the objective function 19 yields

$$\begin{aligned}
&\rho\left\{W^M\left(t_h;\overline{\theta}\right) - \left[\gamma W^M\left(t_{H'};\overline{\theta}\right) + (1-\gamma)W^M\left(t_{L'};\overline{\theta}\right)\right]\right\} \\
&+(1-\rho)\left\{W^M\left(t_l;\underline{\theta}\right) - \left[\gamma W^M\left(t_L;\underline{\theta}\right) + (1-\gamma)W^M\left(t_H;\underline{\theta}\right)\right]\right\} \\
&+(1-\rho)\left[\gamma W\left(t_L;\underline{\theta}\right) + (1-\gamma)W\left(t_H;\underline{\theta}\right)\right] + \rho\left[\gamma W\left(t_{H'};\overline{\theta}\right) + (1-\gamma)W\left(t_{L'};\overline{\theta}\right)\right],
\end{aligned}$$

where I have used the definition $W(t;\theta) \equiv W^X(t) + W^M(t;\theta)$ to simplify.

The first line above is zero according to condition 21. Moreover, the second line above represents the rent from settlement. Finally, the third line of this expression is identical to the objective function of the negotiators in absence of pretrial settlement negotiation.

Lemma 3 (in the appendix) shows that the derivative of the second line with respect to τ_L (τ_H) is negative (positive). This means that at the optimal solution, the derivative of the third line with respect to τ_L (τ_H) is positive (negative). But recall that when there is no pretrial negotiation, the derivatives of the third line with respect to τ_L and τ_H are zero (from the FOC). Therefore, since the third line is concave in τ_L and τ_H, the introduction of pre-trial negotiation increases (decreases) the optimal value of τ_H (τ_L).

A decrease in τ_L moves t_L (and menu L) towards point A in Figure 5, which means that the the optimal agreement tariff, t_L, is now more efficient under normal times (i.e., when $\theta = \underline{\theta}$). Also, an increase in τ_H moves menu H towards A', which results in a greater τ_S. Thus, $\tau_S - \tau_L$ is greater when pretrial negotiations are allowed. ■

7 Conclusion

Besides shedding light on the workings of the WTO dispute settlement process, the proposed model is useful in guiding empirical investigations of this institution. The existing models mostly focus on one stage of the dispute settlement process and, thus, do not capture the effects that other stages might have on the operation of the stage under study. For example, the general direction of the rulings of the DSB in disputes regarding safeguard measures (studied by Sykes 2003 and Grossman and Sykes 2007) may not be indicative of the system's partiality because the cases that are brought before the DSB are not randomly chosen from the universe of potential disputes. In contrast to the existing models, my model captures the important stages of the dispute settlement process, namely, dispute generation, selection of disputes for litigation, the DSB's decision making, compliance, and retaliation.

The proposed model can be extended in several ways. First, the model can be extended by assuming that the complaining parties also receive a noisy signal about the state of the world. This extension would provide a richer setting to study pre-trial bargaining.

Moreover, in this paper I considered countries that are symmetric in political and technological parameters. This assumption greatly simplifies the problem as any proposed mechanism generates the same expected welfare for the negotiating parties and, therefore, no conflict arises in the stage of designing the agreement. An important area for future research is to consider countries that are asymmetric in technology or political parameters. Such an extension of the model would be particularly useful in understanding agreements between developing and developed countries as well as agreements between countries with different political structures.

8 Appendix

Calculation of the welfare functions. World market clearing condition for good x is $D_x(p_x) + D_x^*(p_x - \tau) = Q_x(p_x) + Q_x^*(p_x - \tau)$. Substituting for the supply and demand functions from (1) and (2), the market clearing condition can be rewritten

as $2-2p_x+\tau=p_x+b\left(p_x-\tau\right)$. Solving for p_x yields $p_x=\frac{2+(1+b)\tau}{3+b}$. Similarly, using the world market clearing condition for good y, the home market price for good y can be calculated; $p_y=\frac{2(1-\tau^*)}{3+b}$.

The consumers' surplus from consumption of good x is

$$\psi_x\left(\tau\right)=\int_{p_x}^{1}D_x\left(u\right)du=\frac{1}{2}-p_x+\frac{1}{2}p_x^2=\frac{1}{2}\left(\frac{\left(1+b\right)\left(1-\tau\right)}{3+b}\right)^2.$$

Similarly, the consumers' surplus from consumption of good y can be obtained by using p_x:

$$\psi_y\left(\tau^*\right)=\frac{1}{2}\left(\frac{1+b+2\tau^*}{3+b}\right)^2.$$

The producers' surplus in sector x of the home country is

$$\pi_x\left(\tau\right)=\int_{0}^{p_x}Q_x\left(u\right)du=\frac{1}{2}p_x^2=\frac{1}{2}\left(\frac{2+\left(1+b\right)\tau}{3+b}\right)^2.$$

The producers' surplus in sector y of the home country is

$$\pi_y\left(\tau^*\right)=\int_{0}^{p_y}Q_y\left(u\right)du=\frac{1}{2}bp_y^2=2b\left(\frac{1-\tau^*}{3+b}\right)^2.$$

The import demand is given by:

$$M\left(p_x\right)=D_x\left(p_x\right)-Q_x\left(p_x\right)=1-2p_x=\frac{b-1-2\left(1+b\right)\tau}{3+b}.$$

Therefore, the government's tariff revenue is

$$T\left(\tau\right)=\tau M_x\left(p_x\left(\tau\right)\right)=\frac{\left(b-1\right)\tau-2\left(1+b\right)\tau^2}{3+b}.$$

Politically weighted welfare from the importing sector in home country is given

by

$$\begin{aligned} u(\tau;\theta) &= \psi_x(\tau) + \theta\pi_x(\tau) + T(\tau) \\ &= \frac{1}{(3+b)^2}\left\{ \begin{array}{c} \frac{1}{2}(1+b)^2 + 2\theta + [2\theta(1+b) - 4]\tau \\ + \left[\frac{1+\theta}{2}(1+b)^2 - 2(3+b)(1+b)\right]\tau^2 \end{array} \right\}. \end{aligned} \tag{22}$$

Moreover, the home government's welfare from the exporting sector is:

$$v(\tau^*) = \psi_y(\tau^*) + \pi_y(\tau^*) = \frac{1}{(3+b)^2}\left\{ \frac{(1+b)^2}{2} + 2b + 2(1-b)\tau^* + 2(1+b)\tau^{*2} \right\}.$$

For further use, note that

$$\begin{aligned} u''(\tau;\theta) &= -\frac{(1+b)(11+3b-\theta(b+1))}{(3+b)^2}, \\ v''(\tau^*) &= \frac{4(1+b)}{(3+b)^2}, \end{aligned}$$

which implies that $|u''(\tau;\theta)| > v''(\tau)$. ■

Lemma 2 *A low-type M is strictly better off to settle at $t = t_l^*$ (as defined by condition 16) than to litigate. That is,*

$$W^M(t_l;\underline{\theta}) > \gamma W^M(t_L;\underline{\theta}) + (1-\gamma) W^M(t_H;\underline{\theta}). \tag{23}$$

Proof. Let τ_k be defined implicitly by $v(\tau_k) = \gamma v(\tau_L) + (1-\gamma) v(\tau_H)$. Then, since $|u''(\tau;\theta)| > v''(\tau)$ (see the first item in the appendix) we must have $u(\tau_k;\underline{\theta}) > \gamma u(\tau_L;\underline{\theta}) + (1-\gamma) u(\tau_H;\underline{\theta})$. Similarly, let r_k be defined implicitly by $v(r_k) = \gamma v(r_L) + (1-\gamma) v(r_H)$, which then implies that $u(r_k;\underline{\theta}) > \gamma u(r_L;\underline{\theta}) + (1-\gamma) u(r_H;\underline{\theta})$. Therefore, we have

$$u(\tau_k;\underline{\theta}) + v(r_k) > \gamma[u(\tau_L;\underline{\theta}) + v(r_L)] + (1-\gamma)[u(\tau_H;\underline{\theta}) + v(r_H)],$$

and

$$u\left(r_k;\underline{\theta}\right)+v\left(\tau_k\right)>\gamma\left[u\left(r_L;\underline{\theta}\right)+v\left(\tau_L\right)\right]+\left(1-\gamma\right)\left[u\left(r_H;\underline{\theta}\right)+v\left(\tau_H\right)\right].$$

These two inequalities imply that both parties strictly prefer settlement to litigation if $t=t_k\equiv\left(\tau_k,r_k\right)$. Therefore, there must exist $t_l\in P_{\underline{\theta}}$ such that if $t=t_l$, the exporting country is indifferent between litigation and settlement, while the low-type importing country is strictly better off by settlement. ■

Lemma 3 *The rent from settlement, which is given by*

$$W^M\left(t_l;\underline{\theta}\right)-\left[\gamma W^M\left(t_L;\underline{\theta}\right)+\left(1-\gamma\right)W^M\left(t_H;\underline{\theta}\right)\right],$$

is decreasing in τ_L and increasing in τ_H.

Proof. Define

$$\begin{aligned} f\left(\tau\right) &= W^M\left(\tau,r\left(\tau\right);\theta\right), \\ g\left(\tau\right) &= W^X\left(\tau,r\left(\tau\right)\right), \end{aligned}$$

where $r\left(\tau\right)$ is defined such that $\left(\tau,r\left(\tau\right)\right)\in P_{\underline{\theta}}$. For further use, note that $f'>0$, $f''<0$, $g'<0$, $g''>0$, $f'+g'<0$, $f''+g''<0$.

Equation 16, which determines t_l, can now be written as

$$g\left(\tau_l\right)\equiv\gamma g\left(\tau_L\right)+\left(1-\gamma\right)g\left(\tau_H\right).$$

Take derivative with respect to τ_L and rearranging yields

$$\frac{d\tau_l}{d\tau_L}=\gamma\frac{g'\left(\tau_L\right)}{g'\left(\tau_l\right)}.$$

Now define $t_m\in P_{\underline{\theta}}$ as the tariff pair that makes the importing country indifferent between settlement and litigation when $\theta=\underline{\theta}$, namely, ■

$$f(\tau_m) \equiv \gamma f(\tau_L) + (1-\gamma) f(\tau_H).$$

Taking derivative with respect to τ_L yields

$$\frac{d\tau_m}{d\tau_L} = \gamma \frac{f'(\tau_L)}{f'(\tau_m)}.$$

The rent from settlement can be written as $f(\tau_l) - f(\tau_m)$, and thus, we want to prove that $\frac{d(f(\tau_l)-f(\tau_m))}{d\tau_L} < 0$ and $\frac{d(f(\tau_l)-f(\tau_m))}{d\tau_H} > 0$. The first inequality can be written as

$$f'(\tau_l)\frac{d\tau_l}{d\tau_L} < f'(\tau_m)\frac{d\tau_m}{d\tau_L}.$$

Substituting for $\frac{d\tau_l}{d\tau_L} = \gamma \frac{g'(\tau_L)}{g'(\tau_l)}$ and $\frac{d\tau_m}{d\tau_L} = \gamma \frac{f'(\tau_L)}{f'(\tau_m)}$, and rearranging yields

$$\frac{g'(L)}{g'(l)} < \frac{f'(L)}{f'(l)}$$

or

$$\frac{g'(L) - g'(l)}{g'(l)} < \frac{f'(L) - f'(l)}{f'(l)}.$$

Since $g'' < |f''|$, we have $|g'(l) - g'(L)| < f'(L) - f'(l)$ and $|g'(l)| > f'(l)$. Therefore, this inequality holds and we have $\frac{d(f(\tau_l)-f(\tau_m))}{d\tau_L} < 0$. Similarly, we can prove that $\frac{d(f(\tau_l)-f(\tau_m))}{d\tau_H} > 0$. QED

References

Bagwell, K. and R. Staiger (2005). Enforcement, Private Political Pressure, and the General Agreement on Tariffs and Trade/World Trade Organization Escape Clause. *The Journal of Legal Studies 34*(2), 471–513.

Baldwin, R. (1987). Politically Realistic Objective Functions and Trade Policy: PROFs and Tariffs. *Economic Letters 24*, 287–290.

Baldwin, R. and F. Robert-Nicoud (2007). Entry and Asymmetric Lobbying: Why

Governments Pick Losers. *Journal of the European Economic Association 5*(5), 1064–1093.

Beshkar, M. (2008). Estimating a Model of Settlement Bargaining in the World Trade Organization. *Manuscript, Yale University*.

Beshkar, M. (2010a). Optimal Remedies in International Trade Agreements. *European Economic Review 54*(3), 455 – 466.

Beshkar, M. (2010b). Trade Skirmishes and Safeguards: A Theory of the WTO Dispute Settlement Process. *Journal of International Economics 82*(1), 35 – 48.

Bown, C. (2005). Participation in WTO dispute settlement: Complainants, interested parties, and free riders. *The World Bank Economic Review 19*(2), 287.

Bown, C. P. (2009). *Self-Enforcing Trade: Developing Countries and WTO Dispute Settlement*. Brookings Institution.

Colares, J. (2009). A Theory of WTO Adjudication: From Empirical Analysis to Biased Rule Development. *Vanderbilt Journal of Transnational Law 42*(2), 383–439.

Farber, H. (1980). An Analysis of Final-Offer Arbitration. *Journal of Conflict Resolution 24*(4), 683–705.

Gibbons, R. (1988). Learning in equilibrium models of arbitration. *The American Economic Review 78*(5), 896–912.

Grossman, G. and A. Sykes (2007). United States - Definitive Safeguard Measures on Imports of Certain Steel Products. *World Trade Review 6*(1), 89.

Hillman, A. (1982). Declining Industries and Political-Support Protectionist Motives. *American Economic Review 72*, 1180–1187.

Horn, H. and P. Mavroidis (2006). *The WTO dispute settlement system 1995-2004: Some descriptive statistics*. Washington, DC: World Bank.

Klimenko, M., G. Ramey, and J. Watson (2007). Recurrent trade agreements and the value of external enforcement. *Journal of International Economics 74*(2), 475–499.

Ludema, R. (2001). Optimal International Trade Agreements and Dispute Settlement Procedures. *European Journal of Political Economy 17*(2), 355–376.

Maggi, G. and R. Staiger (2009). Breach, Remedies and Dispute Settlement in Trade Agreements. *NBER Working Paper No. 15460*.

Maggi, G. and R. Staiger (2011). On the Role and Design of Dispute Settlement Procedures in International Trade Agreements. *Quarterly Journal of Economics*.

Myerson, R. (1979). Incentive Compatibility and the Bargaining Problem. *Econometrica 47*(1), 61–73.

Myerson, R. (1991). Analysis of Incentives in Bargaining and Mediation. In H. P. Young (Ed.), *Negotiation Analysis*, pp. 67–85. University of Michigan Press.

Park, J. (2011). Enforcing International Trade Agreements with Imperfect Private Monitoring. *Review of Economic Studies*.

Reinhardt, E. (2001). Adjudication without Enforcement in GATT Disputes. *Journal of Conflict Resolution 45*(2), 174–195.

Rosendorff, B. (2005). Stability and Rigidity: Politics and Design of the WTO's Dispute Settlement Procedure. *American Political Science Review 99*(03), 389–400.

Schropp, S. A. (2009). *Trade Policy Flexibility and Enforcement in the WTO: A Law and Economics Analysis*. Cambridge University Press.

Stevens, C. (1966). Is Compulsory Arbitration Compatible With Bargaining? *Industrial Relations 5*, 38–52.

Sykes, A. (1991). Protectionism as a Safeguard: A Positive Analysis of the GATT Escape Clause with Normative Speculations. *University of Chicago Law Review 58*(1), 255–305.

Sykes, A. (2003). The Safeguards Mess: A Critique of WTO Jurisprudence. *World Trade Review 2*(03), 261–295.

Sykes, A. (2006). *The WTO Agreement on Safeguards: A Commentary*. Oxford University Press, Oxford.

Viscusi, W. (1988). Product Liability Litigation with Risk Aversion. *Journal of Legal Studies 17*, 101–121.

Wilson, B. (2007). Compliance by WTO members with adverse WTO dispute settlement rulings: the record to date. *Journal of International Economic Law 10*, 397–403.

WTO. *Canada - Measures Affecting the Importation of Milk and the Exportation of Dairy Products - Notification of Mutually Agreed Solution*. Volume WT/DS103/33 and WT/DS113/33. World Trade Organization.

WTO. *Dispute Settlement Understanding*. World Trade Organization.

WTO. *European Communities - Measures Concerning Meat and Meat Products (Hormones)- Arbitration Report*. Volume WT/DS26/ARB. World Trade Organization.