

Antidumping Against the Backdrop of Disputes in the GATT/WTO System

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June 2002

Abstract

This paper examines how the rules, institutions and procedures of dispute settlement under the GATT/WTO system can affect the decisions made under a nation's antidumping provisions. That is, we consider a national government's antidumping duty (ADD) decision in a framework which explicitly models the consequence of misusing antidumping provisions as a GATT/WTO trade dispute. We first illustrate when it is that the current set of rules of dispute settlement are ill-equipped to dissuade countries from abusing AD provisions. We then explore how the GATT/WTO rules and procedures can affect the imposed *pattern* of ADDs as well as the different resolutions to the disputes. Finally, we evaluate proposals for reform of antidumping measures and dispute resolution within the WTO.

JEL No. F13

Keywords: Antidumping, Tariff Retaliation, Reciprocity, GATT/WTO, Trade Disputes

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‡ This is a substantially revised version of a paper presented at the Midwest International Economics Group Meetings, whose participants I would like to thank for helpful comments. All remaining errors are my own.

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Abstract

This paper considers the impact of examining a nation's antidumping (AD) provisions within the confines of the GATT/WTO system. That is, we consider a firm's dumping decision and a subsequent national government's antidumping duty (ADD) decision in a framework which explicitly models the consequence of misusing antidumping provisions. The consequence is modeled as a GATT/WTO trade dispute, based on the 'retaliation-as-compensation' approach to dispute resolution. Given the process of dispute settlement in the GATT/WTO system, the theory serves to identify an institution-driven motivation for dumping behavior, as well as another motive for policy discrimination between rival foreign firms in AD decisions.

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1 Introduction

There has been a recent proliferation in both the utilization of antidumping duties (ADDs) by national governments as documented by Miranda et al (1998) and the theoretical and empirical research on dumping and antidumping measures as undertaken by economists, as surveyed by Blonigen and Prusa (2001). However, economic theorists have yet to consider the impact of dumping and antidumping measures within the confines of a retaliation-based dispute settlement system such as the GATT/WTO. That is, most of the literature models dumping behavior by firms and antidumping reactions by governments in *isolation*, i.e. as if there were no recourse to countries and firms who have found themselves injured by the potential abuse of AD provisions.

How do AD measures and the potential abuse of these measures ‘fit’ into the international trading system? Is there evidence that governments which misuse AD provisions actually face international recourse?¹ We argue that countries are increasingly seeking recourse to the dispute settlement procedures of the GATT/WTO to address allegations of a trading partner’s abuse of national AD provisions. That is, along with the increase in utilization of antidumping measures by national governments in recent years, there has also been a marked increase in the number of formal GATT/WTO trade disputes² over alleged misuse of these antidumping measures. Table 1 illustrates, as examples, over thirty such disputes that have transpired since 1989, the last twenty-five of which have evolved as disputes under the WTO since its 1995 inception. Put alternatively, over 10 % of the formal disputes facing the WTO have involved alleged abuse of national AD provisions.³ We argue that it is thus increasingly important to improve our understanding of how the rules of dispute settlement under the GATT/WTO

¹We note that in an alternative and complementary approach, some have argued that the proliferation in the implementation of new AD statutes in traditional ‘non-user’ countries is a response to its misuse in traditional ‘user’ countries such as the US, Canada, Australia, New Zealand and the EU. The argument is that this proliferation is a ‘tit-for-tat’ strategy implemented by governments - that if country A uses AD measures against firms from country B, then country B will pass AD legislation to implement AD measures against firms from country A in return. Prusa and Skeath (2001) have begun to look at this empirical issue more formally.

²In this paper a ‘trade dispute’ will refer to a formal complaint filed by one country against another over alleged abuse of GATT/WTO rules, in this case the allegation of misuse of AD provisions.

³As of 23 May 2002, the WTO had been notified of 259 disputes since its 1995 inception. See WTO (200a).

interact with what is arguably the most “popular” instrument of protection in use. Initial questions of interest from this perspective include: do the rules and procedures of dispute settlement adequately discourage the frivolous imposition of AD measures?⁴ And, do these rules have any influence over the way countries which use AD measures structure the *pattern* of their ADDs? That is, do the rules of dispute settlement and the potential recourse available under the DSU influence an ADD-imposing country to *further* discriminate between trading partners due to the concern over potential retaliation?

To address these issues we consider antidumping measures within the context of a model which explicitly accounts for the potential trade disputes that derive from the misuse of AD measures. In particular, we model the fact that a formal trade dispute may result in GATT/WTO-sanctioned threats of tariff retaliation serving to facilitate compensation, as is apparently the evolving norm.⁵ In our model, a trade dispute concerns the claim of misuse of national antidumping provisions, and its resolution allows for the GATT/WTO to authorize the national plaintiff government (who is representing its ‘abused’ exporting firm) to make formal threats of tariff retaliation as a means of establishing parameters in compensation negotiations with the ADD-implementing country.

Our structure formally considers a very simple and stylized model that is designed to illustrate the institutional points of interest in the relationship between AD measures and dispute settlement. The model consists of three symmetrically-defined countries, and we focus on a potential ‘dumping’ sector in the domestic market that is supplied by a firm in each of the two foreign countries. The timing is such that, in the first period, firms noncooperatively choose outputs and make their ‘dumping’ decisions, in

⁴Finger and Fung (1994, p. 211) address this question by appealing to GATT Article XXIII panel rulings on disputes involving AD cases and conclude that “[t]he GATT dispute settlement process seems unlikely to provide discipline against the increasing number of antidumping restrictions against imports. Both the bureaucratic and the legal momentum of GATT dispute settlement are toward innocuous findings of procedural error that can be corrected without lifting the antidumping order in question.” In contrast to the intent here, they do not, however, look at this question within the context of a formal theoretical model. Our analysis focuses on the problems introduced by the ‘retaliation-as-compensation’ approach to dispute resolution that would still exist, given the current set of rules and practice, even if the GATT/WTO were able to overcome the bureaucratic problems identified by Finger and Fung.

⁵ As examples, compensation in the form of tariff retaliation has recently been authorized and implemented in the US vs. EU disputes over the EU’s failure to remove its Banana import regime, and the EU’s failure to remove the ban over Hormone Treated Beef (see WTO 1999a, Section 7.8 and WTO 1999b, Section III). In its Banana Regime case with the EU, Ecuador (which one might argue is a “small” country with respect to its trade with the EU, in the terms of trade sense) sought and was then authorized to retaliate by withdrawing protection of European firms’ intellectual property rights through its TRIPs commitments (see WTO 2001a, p.6).

the second period the domestic government makes its ADD decision, and in the third period there is a formal dispute settlement phase, given that a ‘potentially unwarranted ADD’ has been implemented.⁶ The trade dispute then has a positive probability of concluding with a negotiated compensation facilitated by a GATT/WTO-sanctioned threat of tariff retaliation by the foreign government(s) in a sector where the ADD-imposing country is an exporter.

While the economics literature which investigates the role of dispute settlement procedures in a self-enforcing agreement such as the GATT/WTO is fairly well established,⁷ the focus on the economics behind the trade disputes themselves is still at somewhat of a nascent stage.⁸ Therefore, to model the trade dispute phase, we utilize a method similar to that found in Bown (forthcoming) which abstracts from this “enforcement” role and instead focuses on the dispute settlement provisions as a setting for *renegotiation* after a policy change has taken place. Another appealing feature of this particular representation of the dispute settlement process is that it has many features consistent with the way that disputes under the GATT/WTO system are handled in practice.⁹

In our basic setting and in a manner consistent with WTO practice, we therefore allow a country that “wins” a trade dispute to be permitted to obtain compensation by responding with a threat of a tariff withdrawal that is guided by the GATT/WTO principle of *reciprocity*.¹⁰ The tariff threat satisfying the reciprocity condition then serves to establish a “benchmark” that the countries use as a reference in their dispute settlement renegotiations back to free trade. Also, as an alternative form of compensation, we allow for potential ADD-imposing defendant countries to avoid the panel process

⁶By ‘potentially unwarranted,’ we are referring to an ADD that has been imposed without satisfying the legal (and not any economic) definition of dumping, which we will formally define within the context of this model below.

⁷With respect to the theoretical literature exploring the dispute settlement procedure’s effectiveness at supporting low equilibrium tariffs, the procedure has typically been modeled as a trigger strategy in an infinitely-repeated, noncooperative, tariff-setting game between countries. Examples of papers in this literature include Kovenock and Thursby (1992), Maggi (1999) and Ludema (2001), and for a survey see Staiger (1995, pp. 1519-28). For our focus on trade disputes, this literature is fairly unhelpful as the typical equilibria in these models either never exhibit trade disputes or exhibit disputes that are automatically triggered after a random fluctuation, such as a terms of trade shock.

⁸There is, however, a developing empirical literature relating to GATT/WTO trade disputes, including investigations by Horn et al (1999), Büttler and Hauser (2000), and Bown (2002).

⁹Bown (forthcoming) takes the GATT/WTO institutional structure and rules of retaliation and considers the question of when it is that a government will utilize the GATT/WTO safeguards provisions as a means of implementing protection when it is necessitated between ‘negotiating rounds’ as opposed to the instances in which it will proceed in a manner which violates GATT/WTO rules and instead will lead to a trade dispute.

¹⁰As will be illustrated in the model below, we rely on the definition of reciprocity as formally developed by Bagwell and Staiger (1999,2001).

by settling their dispute in a manner consistent with GATT/WTO practice. That is, we allow for countries who implement ADDs to resolve the dispute by simply ending the imposition of ADDs *and* refunding any duties collected, as this appears to be an available outside option for countries who have a trade dispute over an AD measure filed against them.¹¹

Our first theoretical results explore the different outcomes of the dispute settlement process, illustrating how the process affects the likelihood that disputes will reach the panel stage, as opposed to being settled or withdrawn. Our most important results yield insight as to how trade disputes differ when a defendant country who is accused of having misused of its AD provisions, faces two plaintiffs as opposed to one. That is, we focus on the incentives created by the process and rules of the dispute settlement system in particular as they create incentives that affect the way an ADD-imposing country structures the *pattern* of its ADDs. We illustrate conditions under which the dispute settlement process of the GATT/WTO system may influence ADD-imposing countries to further *discriminate* between trading partners, irrespective of the presence of any actual ‘dumping’ activity. Our results also illustrate why it is that the current system of dispute settlement is ineffective at discouraging the misapplication of ADDs by national governments. Finally, our last theoretical contribution is an evaluation of proposed reforms, illustrating the impact that these reforms would have on ADD decisions and the pattern of protection. This exercise is particularly useful given the likelihood of antidumping as a topic for reform in the next negotiating round.¹²

With respect to the literature which examines the outcome of antidumping investigations, the model can be interpreted as providing additional economic factors which would serve to influence how domestic authorities structure AD protection when they have *discretion*. That is, in addition to the traditional political economy motives for protecting the domestic industry in one AD petition and not another, we provide other, non-statutory factors which may serve to influence how the ADD decisions are being made.¹³ Our theory provides an additional source of discretion or alternatively, another factor

¹¹ This refunding of duties is a request often made by plaintiff governments in these AD trade disputes and can be an option recommended by a panel. As an example, in its AD dispute with Switzerland over *Coated Woodfree Paper Sheets*, Australia settled the case before it reached the panel stage by simply terminating the provisional ADDs that were in place and refunding the duties that had been collected (WTO 1998).

¹²For a discussion of antidumping in the next negotiating round, see Messerlin (2000).

¹³With respect to this discretion issue, researchers such as Hansen (1990), Moore (1992), Baldwin and Steagall (1994) and Hansen and Prusa (1997) have focused on the empirical question of whether administered protection in the United States has been influenced by political economy motivations, as have Eymann and Schuknecht (1996) for the case of the EU.

potentially influencing the decisions made by the US (and other countries') AD authorities which is not a statutory consideration. The empirical impact of this potential discretion in the US context is the examination of Blonigen and Bown (forthcoming).

In terms of anecdotal evidence that may also serve to motivate the analysis undertaken here, Hansen and Prusa (1997 p. 243), for example, find that country-specific factors play a substantial role in the US AD authority's protection decision, citing that western European countries are 17% less likely to have been found by the authority to have caused material injury. Prusa (1997) has also found that the majority of US cases were brought against low wage countries. With respect to European AD petitions filed between 1985-1990, Vandebussche et al (1999a) also find that 70% of all cases were against firms from low wage countries. While firms from these countries undoubtedly face labor costs that make it more likely that they will set prices that are "less than fair value" and that therefore satisfy the statutory definition of dumping, it is not improbable that these low wage countries are also relatively powerless in the GATT/WTO system which mandates that countries have the *capacity* to credibly threaten tariff retaliation if they hope to rely on the recourse available through the dispute settlement system to discourage the abuse of AD measures.

The rest of this paper proceeds as follows. Section 2 introduces the model, and Section 3 breaks down the welfare effects driven by a policy change within the context of this model. Section 4 then illustrates the timing involved in the game, discussing the simple specification for the process of a trade dispute and how it relate to dumping and antidumping duties, before analyzing the equilibrium of interest. Section 5 then considers potential reforms to the compensation scheme in potential AD trade disputes, and Section 6 concludes with a discussion of relevance for empirical work.

2 The Model

We utilize a stylized, three country, three period model designed to highlight the economic features of interest and to focus attention on some of the institutional aspects of how antidumping provisions and trade disputes interact under the GATT/WTO system. Consider then three symmetrically defined countries: X , Y and Z . Each country consumes one good: x is consumed in X , y in Y and z in Z . Each good is produced in all three countries: by a competitive fringe in the consuming country and by a duopolist producing only for export in each of the two other countries. For example, good x is consumed only in X , is produced by a competitive fringe in X and by a duopolist firm for export to X

in Y and by a duopolist firm for export to X in Z . The sector of interest for the dumping/antidumping behavior will be x , and it will thus often be convenient in our discussion to take the perspective of country X . Therefore, we will interchangeably refer to country X as ‘Home’ and countries Y and Z as the ‘Foreign’ trading partners. The y and z sectors will serve primarily as the sectors for determining potential retaliation when it is to be used as compensation in a trade dispute.

We parameterize the basic features of the model in order to simplify and evaluate welfare benchmarks in the analysis that follows below.¹⁴ We let superscripts refer to products and subscripts refer to countries. For example, with respect to prices, the price of good x received by a duopolist in country Y is p_Y^x .

We assume linear demand for the consumption good in each market given by $D_X^x(p_X^x) = \alpha^x - p_X^x$, $D_Y^y(p_Y^y) = \alpha^y - p_Y^y$, and $D_Z^z(p_Z^z) = \alpha^z - p_Z^z$. The output of the competitive fringe in each of the consuming markets is $Q_X^x(p_X^x) = p_X^x$ in X , $Q_Y^y(p_Y^y) = p_Y^y$ in Y , and $Q_Z^z(p_Z^z) = p_Z^z$ in Z . This yields a residual demand function that is equivalent to each country’s import demand function of $M_X^x(p_X^x) \equiv D_X^x(p_X^x) - Q_X^x(p_X^x) = \alpha^x - 2p_X^x$ in X , $M_Y^y(p_Y^y) \equiv D_Y^y(p_Y^y) - Q_Y^y(p_Y^y) = \alpha^y - 2p_Y^y$ in Y , and $M_Z^z(p_Z^z) \equiv D_Z^z(p_Z^z) - Q_Z^z(p_Z^z) = \alpha^z - 2p_Z^z$ in Z .

We assume that the duopolist in j exporting to market i has a constant marginal cost given by $c_j^i \geq 0$ with $i \neq j \in \{X, Y, Z\}$ and no fixed cost. So as to establish a setting consistent with practice under the AD statutes and dispute settlement provisions of the GATT/WTO system, we allow each country i a specific tariff over its imports of its consumption good i from a firm in j , which we denote τ_j^i for $i \neq j \in \{X, Y, Z\}$. We do not allow for export policies here as our focus is restricted to ADDs and potential retaliatory tariffs, which is consistent with GATT/WTO practice.¹⁵

Given this structure, a duopolist firm’s time invariant, per-period profit function is

$$\Pi_j^i \equiv p_i^i(\cdot)q_j^i - c_j^i q_j^i - \tau_j^i q_j^i, \quad i \neq j \in \{X, Y, Z\} \quad (1)$$

For interpretation purposes, consider a firm in the x sector and its per-period profit function of (1) Π_j^x : $\hat{p}_x^x(\cdot)$ is the residual inverse demand facing a duopolist firm, q_j^x is the output of x by the firm in j , and

¹⁴While we have a three period model, we omit time subscripts as the fundamentals of the model are time-invariant, and in later sections it will be clear as to which period we are referring.

¹⁵We also do not explicitly consider alternative AD measures such as price undertakings (as opposed to ADDs), though we will provide a discussion of how some of our results may be interpreted in this context below.

τ_j^x is the specific tariff imposed by Home (country X) on its imports from the duopolist firm in j .¹⁶

Throughout we generally assume that the exporting duopolist firms behave noncooperatively in a Cournot setting where they choose per period outputs, given the trade policies (tariffs) that will be in place that period.¹⁷ Therefore, we can use (1) to work through the best response functions and solve for per-period Nash (N) outputs as a function of imposed tariffs,

$$q_j^{i,N}(\tau_j^i, \tau_k^i) = \frac{\alpha^i - 4c_j^i - 4\tau_j^i + 2c_k^i + 2\tau_k^i}{3} \quad \text{for } i \neq j \neq k \in \{X, Y, Z\}. \quad (2)$$

To ensure nonnegative levels of trade from each source in equilibrium, using (2) we assume $(2\tau_j^i - \tau_k^i) \leq (\alpha^i - 4c_j^i + 2c_k^i)/2$. Given then that firms are producing their Nash outputs, we can rewrite local prices as a function of the governments' available tariff policies. In sector i , $\hat{p}_i^i(\tau_j^i, \tau_k^i) = (\alpha^i + 2c_j^i + 2\tau_j^i + 2c_k^i + 2\tau_k^i)/6$ is the local price in the consuming country $i \in \{X, Y, Z\}$, and $\hat{p}_j^i(\tau_j^i, \tau_k^i) = (\alpha^i + 2c_j^i - 4\tau_j^i + 2c_k^i + 2\tau_k^i)/6$ is the local price facing the exporting duopolist in $j \neq i \neq k \in \{X, Y, Z\}$. Under the assumption of no export policies, there are (potentially) two different 'world' prices in each sector i and each is equivalent to the price received by the duopolist exporter.

Next we detail each of the governments' objective functions. Formally, for the Home government let its welfare function be given by $W_X = W_X^x + W_X^y + W_X^z$, where

$$\begin{aligned} W_X^x(\tau_Y^x, \tau_Z^x) &= \int_{\hat{p}_X^x}^{\alpha^x} D_X^x(p_X^x) dp_X^x + \int_0^{\hat{p}_X^x} Q_X^x(p_X^x) dp_X^x + \tau_Y^x q_Y^x + \tau_Z^x q_Z^x \\ W_X^y(\tau_X^y, \tau_Z^y) &= \Pi_X^y \quad \text{and} \quad W_X^z(\tau_X^z, \tau_Y^z) = \Pi_X^z, \end{aligned} \quad (3)$$

which is the combination of consumer surplus, producer surplus of the competitive fringe and tariff revenue in the x sector, and the profits of the duopolists in X who export y and z . On the other hand, the Y government's welfare function is symmetrically defined as $W_Y = W_Y^x + W_Y^y + W_Y^z$, where

$$\begin{aligned} W_Y^x(\tau_Y^x, \tau_Z^x) &= \Pi_Y^x \quad \text{and} \quad W_Y^z(\tau_X^z, \tau_Y^z) = \Pi_Y^z \\ W_Y^y(\tau_X^y, \tau_Z^y) &= \int_{\hat{p}_Y^y}^{\alpha^y} D_Y^y(p_Y^y) dp_Y^y + \int_0^{\hat{p}_Y^y} Q_Y^y(p_Y^y) dp_Y^y + \tau_X^y q_X^y + \tau_Z^y q_Z^y. \end{aligned} \quad (4)$$

¹⁶It has been well documented that antidumping provisions are largely attractive to national policymakers because they are able to avoid MFN considerations, which we implicitly allow for here.

¹⁷There will be one exception to this in that we will allow duopolists in the x sector only in the first period the opportunity to "dump" (to be defined below). In all other instances outputs will assume to be determined by (2).

And with respect to Z we have $W_Z = W_Z^x + W_Z^y + W_Z^z$, where

$$\begin{aligned} W_Z^x(\tau_Y^x, \tau_Z^x) &= \Pi_Z^x & \text{and} & & W_Z^y(\tau_X^y, \tau_Z^y) &= \Pi_Z^y \\ W_Z^z(\tau_X^z, \tau_Y^z) &= \int_{\hat{p}_Z^z}^{\alpha^z} D_Z^z(p_Z^z) dp_Z^z + \int_0^{\hat{p}_Z^z} Q_Z^z(p_Z^z) dp_Z^z + \tau_X^z q_X^z + \tau_Y^z q_Y^z. \end{aligned} \quad (5)$$

It will be useful in our analysis below to have at our disposal the per-period (unilaterally) optimal tariff(s). Consider then the government of country i and through its maximization of W_i , we can identify its best response functions, given by

$$\tau_j^i(\tau_k^i) = \frac{\alpha^i - 10c_j^i + 8c_k^i + 14\tau_k^i}{22} \quad \text{for} \quad i \neq j \neq k \in \{X, Y, Z\}. \quad (6)$$

Therefore, the optimal policies for country $i \neq j \neq k \in \{X, Y, Z\}$ are

$$\tau_j^{i,O} = \frac{\alpha^i - 10c_j^i + 8c_k^i}{22}, \quad \tau_k^{i,FT} = 0 \quad (7)$$

$$\tau_j^{i,T} = \frac{\alpha^i - 3c_j^i + c_k^i}{8}, \quad \tau_k^{i,T} = \frac{\alpha^i - 3c_k^i + c_j^i}{8} \quad (8)$$

where here the superscripts FT represents *free trade*, O represents a case of a tariff versus *one* exporter only, and T represents a case of tariffs against *two* (i.e. both) exporters. That is, if country i were (say) constrained to offer free trade to k but were to impose an optimal tariff against j we would have the tariffs in (7), whereas if it were to impose an optimal tariff on imports from both partners we would have the tariffs in (8). Note that we will further assume that $\alpha^i \geq 10c_j^i - 8c_k^i$ and $\alpha^i \geq 3c_j^i - c_k^i$ to restrict our attention to non-negative import tariffs.¹⁸

As the starting point for our analysis, however, we assume that $\tau_j^i = 0$ for all $i \neq j$ in the first period so that we commence our analysis from a state of free trade.¹⁹ Again, in this environment we purposely

¹⁸To serve as an intermediate check as to the sensibility of our structure, note that an examination of (8) confirms the Hwang and Mai (1991, p. 697) result that under optimal discriminatory tariffs and linear marginal costs, country i would impose a higher tariff on the firm with lower marginal costs, and the difference in the tariffs is half the difference in marginal costs, i.e. $\tau_j^{i,T} - \tau_k^{i,T} = 1/2(c_k^i - c_j^i)$.

¹⁹In the usual way, we can make additional assumptions to close the partial equilibrium model by adding one numeraire good to be traded between each country pair, 0_{ij} for $i \neq j \in \{X, Y, Z\}$ (traded only between country i and j), where we would assume that the utility of the representative agent in i is $U_i = C_{0_{ij}} + C_{0_{ik}} + (C_i - C_i^2/2)$ where C_i denotes consumption of the good $i \in \{X, Y, Z\}$ and $C_{0_{ij}}$ and $C_{0_{ik}}$ denote consumption of the numeraire goods $i \neq j \neq k \in \{X, Y, Z\}$. Assuming that 0_{ij} is sufficiently abundant in each i and j so that it is consumed in positive amounts by

abstract from “enforcement” concerns that might question how we would arrive at and sustain free trade, instead focusing on the interaction of the rules of dispute settlement and AD measures.

3 Welfare Effects Resulting from a Unilateral Policy Change

Before we proceed to a discussion of policy changes within the context of the GATT/WTO system, it is illustrative to first decompose by standard means the welfare effects induced by a unilateral tariff increase by a national government. Since each country imports from two trading partners, there are two cases to consider: first a tariff increase with respect to one country only, and then a tariff increase with respect to both trading partners.

3.1 A Tariff Increase Against One Country Only

To illustrate, suppose that Home raises its tariff against the exporter from Foreign j from its initial level of zero (free trade) to some nonprohibitive level $\tau_j^{x,1}$, while maintaining free trade with the exporter from k . With respect to country X , the impact on its welfare is illustrated in Figure 1a. Note then that the welfare effects can be broken down exhaustively as follows.

3.1.1 Terms of Trade Effect

When Home imposes a higher tariff on imports from j , it shifts the terms of trade with respect to j in its favor by driving down the price that the exporter in j receives for x . The result is a *terms of trade (TOT) gain* (given by the vertically striped rectangle in Figure 1a.) to Home of

$$[p_j^x(0, 0) - p_j^x(\tau_j^{x,1}, 0)]q_j^{x,N}(\tau_j^{x,1}, 0) = \frac{2}{9}\tau_j^{x,1}(\alpha^x - 4c_j^x - 4\tau_j^{x,1} + 2c_k^x). \quad (9)$$

3.1.2 Deadweight Loss Effect

When Home increases its tariff, there is also an associated deadweight loss. The sum of Home’s traditional consumption and production distortion associated with the tariff increase are each agent, the marginal utility of income is fixed at unity and we can utilize partial equilibrium analysis in the other, non-numeraire sectors. Final trade in good 0_{ij} will then be determined by the requirement of bilateral trade balance between country i and j .

$$[p_X^x(\tau_j^{x,1}, 0) - p_j^x(0, 0)]^2 = \frac{1}{9}\tau_j^{x,1^2}. \quad (10)$$

3.1.3 Trade Diversion Effect

Home also suffers a welfare loss due to the terms of trade *loss* to exporters in k (given by the diagonally striped rectangle in Figure 1a.). We will refer to this as the *trade diversion (TD) effect* and it is given by

$$[p_j^x(\tau_j^{x,1}, 0) - p_j^x(0, 0)]q_k^{x,N}(\tau_j^{x,1}, 0) = \frac{1}{9}\tau_j^{x,1}(\alpha^x - 4c_k^x + 2\tau_j^{x,1} + 2c_j^x). \quad (11)$$

3.1.4 Profit Loss in j

Home's tariff also imposes welfare losses on the duopolist firm in j . The tariff increase causes profits to the exporter in j to fall by an amount equal to

$$\begin{aligned} \Pi_j^x(0, 0) & - \Pi_j^x(\tau_j^{x,1}, 0) \\ & = [p_j^x(0, 0) - p_j^x(\tau_j^{x,1}, 0)]q_j^{x,N}(\tau_j^{x,1}, 0) + [p_j^x(0, 0) - c_j^x][q_j^{x,N}(0, 0) - q_j^{x,N}(\tau_j^{x,1}, 0)] \\ & = \frac{2}{9}\tau_j^{x,1}(\alpha^x - 4c_j^x - 4\tau_j^{x,1} + 2c_k^x) + \frac{2}{9}\tau_j^{x,1}(\alpha^x - 4c_j^x + 2c_k^x). \end{aligned} \quad (12)$$

Note that this profit loss can be broken down into two further effects: the first term in (12) is lost profits due to the *terms of trade loss* that is identical to (9), and the second term is the remainder of the lost profits which we will designate as the *export reduction (ER) effect*, or the lost profits due to the reduction in exports (when valued at free trade prices).

3.1.5 Profit Diversion to k

Home's tariff on imports from j also improves the profits of the duopolist firm in Foreign k by

$$\begin{aligned} \Pi_k^x(\tau_j^{x,1}, 0) & - \Pi_k^x(0, 0) \\ & = [p_k^x(\tau_j^{x,1}, 0) - p_k^x(0, 0)]q_k^{x,N}(\tau_j^{x,1}, 0) + [p_k^x(0, 0) - c_k^x][q_k^{x,N}(\tau_j^{x,1}, 0) - q_k^{x,N}(0, 0)] \\ & = \frac{1}{9}\tau_j^{x,1}(\alpha^x - 4c_k^x + 2\tau_j^{x,1} + 2c_j^x) + \frac{1}{9}\tau_j^{x,1}(\alpha^x - 4c_k^x + 2c_j^x). \end{aligned} \quad (13)$$

Note that this profit gain can be broken down into two further effects: the first term in (13) is the increase in profits due to the terms of trade gain which he have defined as the *TD Effect* of (11), and the second term in (13) is the remainder of the increased profits which we will designate as the *export expansion (EE) effect*.

3.1.6 Combining the Welfare Effects

Finally let us combine the effects on Home and Foreign j 's welfare that arise when Home imposes a higher tariff on its imports of x from j .²⁰ One means by which we can aggregate the effects that will simplify the analysis that follows in the bargaining section is to consider the net impact on welfare (Home effect - Foreign j effect) of a tariff increase from free trade to $\tau_j^{x,1} > 0$, defined as follows

$$\begin{aligned}\Omega_{Xj}^x(\tau_j^{x,1}, 0) &\equiv [W_X^x(\tau_j^{x,1}, 0) - W_X^x(0, 0)] - [W_j^x(\tau_j^{x,1}, 0) - W_j^x(0, 0)] \\ &= \left[\frac{4}{9}\tau_j^{x,1}(\alpha^x - 4c_j^x - 4\tau_j^{x,1} + 2c_k^x) \right] + \left\{ \frac{1}{9}\tau_j^{x,1}(\alpha^x - 10c_j^x + 8c_k^x - 3\tau_j^{x,1}) \right\}\end{aligned}\quad (14)$$

Note that the term in square brackets is simply twice the *TOT Effect* (Home gain - Foreign j loss), and the term in curly brackets represents the combination of the other effects (*ER Effect* - *DWL Effect* - *TD Effect*).

In a symmetric fashion we can define the net welfare effects (between Foreign j and Home) that arise should Foreign j raise its tariff to $\tau_X^{j,1}$ vis-à-vis an exporter from X as

$$\begin{aligned}\Omega_{jX}^j(\tau_X^{j,1}, 0) &\equiv [W_j^j(\tau_X^{j,1}, 0) - W_j^j(0, 0)] - [W_X^j(\tau_X^{j,1}, 0) - W_X^j(0, 0)] \\ &= \left[\frac{4}{9}\tau_X^{j,1}(\alpha^j - 4c_X^j - 4\tau_X^{j,1} + 2c_k^j) \right] + \left\{ \frac{1}{9}\tau_X^{j,1}(\alpha^j - 10c_X^j + 8c_k^j - 3\tau_X^{j,1}) \right\} \\ &\quad \text{for } j \neq k \in \{Y, Z\}\end{aligned}\quad (15)$$

3.2 A Tariff Increase Against Both Countries

Alternatively, suppose Home raises its tariff against the exporter in Y to $\tau_Y^{x,1}$ and against the exporter in Z to $\tau_Z^{x,1}$. The welfare effects are now illustrated in Figure 1b.

²⁰The reasons for omitting the welfare improvement to country k through the *TD Effect* will become apparent through our discussion below.

3.2.1 Terms of Trade Effect vs. Each j

When Home imposes a higher tariff, it now shifts the terms of trade with respect to both exporters in its favor by driving down the price that they each receive for good x . The result is a terms of trade *gain* (see the vertically and horizontally shaped rectangles in Figure 1b.) to Home vis-à-vis each country $j \neq k \in \{Y, Z\}$ of²¹

$$[p_j^x(0, 0) - p_j^x(\tau_j^{x,1}, \tau_k^{x,1})]q_j^{x,N}(\tau_j^{x,1}, \tau_k^{x,1}) = \frac{1}{9}(2\tau_j^{x,1} - \tau_k^{x,1})(\alpha^x - 4c_j^x - 4\tau_j^{x,1} + 2c_k^x + 2\tau_k^{x,1}). \quad (16)$$

3.2.2 Deadweight Loss Effect

When Home increases its tariffs, there is also an associated deadweight loss now given by

$$[p_X^x(\tau_Y^{x,1}, \tau_Z^{x,1}) - p_X^x(0, 0)]^2 = \frac{1}{9}(\tau_Y^{x,1} + \tau_Z^{x,1})^2. \quad (17)$$

3.2.3 Profit Loss in Each j

Home's tariff increase causes profits to the exporter in each $j \neq k \in \{Y, Z\}$ to fall by

$$\begin{aligned} \Pi_j^x(0, 0) - \Pi_j^x(\tau_j^{x,1}, \tau_k^{x,1}) & \quad (18) \\ &= [p_j^x(0, 0) - p_j^x(\tau_j^{x,1}, \tau_k^{x,1})]q_Y^{x,N}(\tau_j^{x,1}, \tau_k^{x,1}) + [p_j^x(0, 0) - c_j^x][q_j^{x,N}(0, 0) - q_j^{x,N}(\tau_j^{x,1}, \tau_k^{x,1})] \\ &= \frac{2}{9}(2\tau_i^{x,1} - \tau_k^{x,1})(\alpha^x - 4c_i^x - 2\tau_i^{x,1} + 2c_k^x + \tau_k^{x,1}) + \frac{1}{9}(2\tau_i^{x,1} - \tau_k^{x,1})(\alpha^x - 4c_i^x + 2c_k^x) \end{aligned}$$

We note again that this profit loss can be broken down into two further effects: the first term in (18) is lost profits due to the reduction in the terms of trade (another *TOT Effect vs. j*) identical to (16), and the second term is the remainder of the lost profits which we will designate as due to reduced exports, or the *export reduction (ER) effect vs. j*.

²¹The terms of trade gain with respect to each exporter may potentially be different given that we have not imposed any MFN limitations. Note that in terms of Figure 1b., we are simply *illustrating* a case where Home's *TOT gain* with respect to Foreign Y is greater than that with respect to Foreign Z , we have not imposed any parameter restrictions that imply that this need to be the case.

3.2.4 Combining the Welfare Effects

In a manner similar to the last section, let us combine the welfare effects, this time by including the impact of a tariff increase by Home on its own, Foreign Y and Foreign Z 's welfare. Again, we aggregate by considering the net welfare effect (Home effect - Foreign Y effect - Foreign Z effect) of an increase in the tariffs from free trade to $\tau_Y^{x,1} > 0$ and $\tau_Z^{x,1} > 0$, defined as follows

$$\begin{aligned}
\Omega_{XYZ}^x(\tau_Y^{x,1}, \tau_Z^{x,1}) &\equiv \left[W_X^x(\tau_Y^{x,1}, \tau_Z^{x,1}) - W_X^x(0, 0) \right] \\
&\quad - \left[W_Y^x(\tau_Y^{x,1}, \tau_Z^{x,1}) - W_Y^x(0, 0) \right] - \left[W_Z^x(\tau_Y^{x,1}, \tau_Z^{x,1}) - W_Z^x(0, 0) \right] \\
&= \frac{2}{9}(2\tau_Y^{x,1} - \tau_Z^{x,1})(\alpha^x - 4c_Y^x - 4\tau_Y^{x,1} + 2c_Z^x + 2\tau_Z^{x,1}) + \\
&\quad \frac{2}{9}(2\tau_Z^{x,1} - \tau_Y^{x,1})(\alpha^x - 4c_Z^x - 4\tau_Z^{x,1} + 2c_Y^x + 2\tau_Y^{x,1}) + \\
&\quad \frac{1}{9} \left[(2\tau_Y^{x,1} - \tau_Z^{x,1})(\alpha^x - 4c_Y^x + 2c_Z^x) + (2\tau_Z^{x,1} - \tau_Y^{x,1})(\alpha^x - 4c_Z^x + 2c_Y^x) - (\tau_Y^{x,1} + \tau_Z^{x,1})^2 \right]
\end{aligned} \tag{19}$$

Note that the first term in (19) is simply twice the *terms of trade effect vs. Y* (Home gain - Foreign Y loss), the second term is simply twice the *terms of trade effect vs. Z* (Home gain - Foreign Z loss), while now the third term represents the combination of the other effects (*ER Effect vs. Y + ER Effect vs. Z - DWL Effect*).

Equations (14), (15) and (19) will be very useful in the analysis of the equilibria discussed below. Next, however we turn to a discussion of the timing involved in the game.

4 The Three Period Game

Again, we start our analysis from an initial state of free trade, assuming that governments have bound their first period tariffs at zero.

The timing of the game is then as follows. In period 1, under the conditions of free trade, firms compete noncooperatively and export to the appropriate X, Y , and Z markets that are each also supplied by a competitive fringe. In the x sector, given that Home has an antidumping statute, the duopolists are also faced with their one-time ‘dumping’ decision. To formalize what we mean by ‘dumping’ within the context of our model, we define a firm as ‘dumping’ if it increases its exports to a level above the standard, Cournot-Nash equilibrium level of output given by (2) in period 1.²² Given the first period outputs, the Home government then makes its second period trade policy decision.

²²As an example, in practice in the US, ‘dumping’ is defined as pricing below what is termed “less than fair value.”

In period 2 the firms again play a Cournot game, given the second period trade policy that Home has implemented. The trade policies that we allow Home to impose in the second period include: (i) continued free trade with both exporters, (ii) an ADD vs. the firm in Y only, (iii) an ADD vs. the firm in Z only, or (iv) ADDs vs. the firm in Y and Z . We assume that the ADDs imposed by Home in (ii) through (iv) are the optimal tariffs identified in (7) or (8).²³ In terms of ‘antidumping,’ it is important to note that we do *not* constrain the Home government to only impose a second period ADD on a firm that has dumped in the first period. We allow the Home government to choose between implementing ADDs against either firm, both firms, or neither firm in the second period, regardless of whether or not the statutory definition of ‘dumping’ was actually satisfied and the pattern of any dumping might have occurred.

Our motivation behind this framework is twofold. First, the primary purpose of this exercise is to analyze how the possible *abuse* of AD provisions (e.g. Home imposing an ADD on a firm that didn’t dump) is affected by being subject to GATT/WTO review and dispute settlement proceedings. Therefore, we need a model that allows for the possibility that Home will impose an ADD on a firm that didn’t actually “dump.” Second, we argue that given the vague criterion set out in national AD provisions, it is likely that there is substantial discretion in the way in which they are administered in practice. For example, one of the results of the Uruguay Round was that the domestic industry injury determination in an AD case is done by examining the *cumulation* of competing imports from *all* countries under investigation and not solely the imports from the country accused of dumping in an individual petition. This can be interpreted as creating an incentive for domestic firms to potentially “overname” foreign competitors in AD petitions, including those that didn’t ‘dump,’ in order to increase Dumping is then verified by checking for evidence of international price discrimination and/or foreign firms selling below some constructed measure of their costs. It is not critical to our results as to how one defines dumping, so we choose a particularly simple definition here and one that is used elsewhere in the literature (see for example, Blonigen and Ohno 1998). For our purposes, it is only important that the definition of dumping is known so that a firm knows how to ‘dump’ in order to satisfy the definition.

²³It would be straightforward to use a differently constructed underlying model, say where there was Bertrand competition and rather than optimal tariffs, the ADDs were simply defined as the difference between the marginal costs of the domestic industry and the Foreign exporter, another assumption that is common in the literature (see, for example, Vandenbussche et al. 1999b). We argue therefore that our assumption of Home imposing ADDs in the form of ‘optimal tariffs’ is not critical, as applying the process of dispute resolution that we illustrate below to such a model would cause us to examine the same breakdown of welfare effects as we have under consideration here.

the likelihood of a positive injury determination through the application of the cumulation rule.²⁴ Our structure then investigates whether the rules of dispute settlement of the GATT/WTO system may play an additional (non-statutory) role in influencing the national AD authority’s ultimate decision as it sorts through the petitions it receives.²⁵

In period 3, we introduce an additional policy instrument to facilitate our analysis, a one time lump-sum transfer T_{Xj} between Home and Foreign $j \in \{Y, Z, YZ\}$, where T_{XYZ} is now the total net transfer from Home to Foreign Y and Foreign Z . That is, we define $T_{XY} > 0$ as a transfer from Y to X , $T_{XZ} > 0$ is a transfer from Z to X , and $T_{XYZ} > 0$ is the total transfer from Y and Z to X (e.g. if Home had imposed second period ADDs against the firm in Y and Z).²⁶ To illustrate the differences in a one plaintiff and two plaintiff dispute, we will assume that Y and Z negotiate together in any trade dispute where Home has imposed ADDs on the firm in Y and Z .²⁷ If no ADDs were imposed in period 2, then we assume that free trade continues automatically in period 3 and that no transfer occurs. If, however, Home has imposed an ADD against a firm in $j \in \{Y, Z, YZ\}$ in period 2, we assume that Foreign j first proceeds by initiating trade dispute through the simple request of consultations with Home (at zero cost).

Given the request of consultations, the third period trade dispute is then resolved in one of three ways. First, we assume that Home can unilaterally end the dispute at zero cost by removing the ADDs imposed in period 2 and using the transfer to refund any tariff revenue collected.²⁸ If Home refuses to refund the duties, Foreign j has the option of withdrawing the case at zero cost and continuing to

²⁴Note however, that we do not look to address the cumulation issue within the context of our model here. For a discussion of *cumulation* and its effect on increasing the likelihood of a positive injury determination in the case of the US, see Hansen and Prusa (1996) and for the EU, see Tharakan et al (1998).

²⁵As suggested earlier, the other necessary condition is that there must be evidence of ‘dumping,’ or pricing at “less than fair value.” Prusa (1991) however, reports that of the 395 AD petitions filed in the US between 1980 and 1988, only 6% were rejected by the ITA for failing to find sales at “less than fair value.” He also notes that over 70% of those AD petitions were part of a filing against multiple trading partners.

²⁶Given our assumptions, it will only be necessary to identify the sum of transfers to Y and Z and *not* the distribution of transfers between Y and Z .

²⁷While none of the disputes illustrated in Table 1 have multiple plaintiffs, there are many ‘non-AD’ GATT/WTO disputes that have had multiple countries file as plaintiffs. On the other hand, in many of the ‘AD’ GATT/WTO disputes of Table 1 have had submissions by “interested third parties” who are often countries who have firms who have experienced the same abuse as the firms represented by the formal plaintiff country.

²⁸This would be an outcome similar to the earlier mentioned *Coated Woodfree Paper Sheets* (see footnote 11), where Foreign j requests consultations, and the two parties agree to a settlement before a panel is convened.

face the ADD imposed by Home. The other alternative for Foreign j if Home has refused to refund the duties, is to request the establishment of a panel, which we assume entails a cost of $F_j \geq 0$. We assume that the panel will rule that Foreign j has “won” its dispute against Home with some probability $\lambda_j \geq 0$, and that if Foreign j wins it will then be authorized to make a GATT/WTO-sanctioned *threat* of tariff retaliation, the level of which will be discussed below.²⁹ With probability $(1 - \lambda_j)$ Foreign j loses the dispute and is not authorized to threaten a retaliation. The combination of Home and Foreign j welfare levels (determined by Home’s second period ADD and Foreign j ’s potential tariff withdrawal threat) then serve as a benchmark for the countries to use in their renegotiations back to free trade. Finally, in this third period we again assume that the duopolist firms are competing noncooperatively.

We focus on subgame perfect equilibria in the model and thus start from the end and solve the model backward. The first step is to thus detail the process by which trade disputes are resolved.

4.1 Period 3 - The Potential Trade Dispute

We allow for two types of potential trade disputes to occur - a dispute initiated by one of Home’s trading partners or a dispute initiated by both partners, depending on whether Home imposed an ADD on one exporter or two in the second period. We focus first on the one partner dispute.

Before we proceed, it will help to simplify the analysis if we set the costs of each of the duopolists in the potential retaliatory sectors to zero, i.e. assume $c_X^y = c_Z^y = c_X^z = c_Y^z = 0$.

4.1.1 A Trade Dispute with One Partner

Assume that Home has imposed an ADD on second period imports from the firm in Foreign j *only*. That is, throughout this section we will assume that Home has structured its second period AD measures to be the tariffs of $\{\tau_j^{x,O}, \tau_k^{x,FT}\}$ for $j \neq k \in \{Y, Z\}$ of (7). Under the assumptions of the model, we then have that Foreign j initiates a trade dispute under the GATT/WTO against Home by first requesting consultations at zero cost. We assume next that Home has two choices in how it can respond. First, it can end the dispute by simply removing the ADD it imposed on j in the second period and refunding the duties (D) it had collected, yielding a transfer of

²⁹Under the WTO’s DSU in practice, a case generally has to proceed through first a panel stage, then an appeal to the Appellate Body, and then to an arbiter who decides the compensation given by the level of permissible retaliation. For a discussion of the legal process, see Petersmann (1997). In our model we simplify by condensing these three stages and assuming that a given case makes it through the entire process with probability λ_j .

$$T_{Xj}^D \equiv -\tau_j^{x,O} \cdot q_j^{x,N}(\tau_j^{x,O}, 0) = -\frac{1}{242}(\alpha^x - 10c_Y^x + 8c_Z^x)(3\alpha^x - 8c_Y^x + 2c_Z^x) \quad (20)$$

Alternatively, Home could refuse to remove the ADD and, provided that Foreign j continues the dispute and asks for the convening of a panel, accept the judgment of the panel. Given that the cost to Foreign j of prosecuting its case is $F_j \geq 0$, we also assume that the cost to Home of defending itself in such a case is $F_X \geq 0$. Home's cost may be considered as a potential cost to its reputation, in addition to legal costs, if indeed this is an instance in which Home has imposed ADDs against a firm that has not dumped.³⁰ If a panel is convened, we assume that the panel will find that Home has violated its GATT/WTO obligations with probability λ_j . We can think of this as $\lambda_j \in \{\lambda_j^j, \lambda_j^{jk}, \lambda_j^k, \lambda_j^0\}$, with $0 \leq \lambda_j^j \leq \lambda_j^{jk} \leq \lambda_j^k \leq \lambda_j^0 \leq 1$, where the superscript on λ_j refers to which firm dumped: i.e. ' jk ' indicates that both the firm in j and k dumped, and '0' indicates that *neither* the firm in j nor k in the x sector dumped. Therefore, we allow for the notion that the probability of Foreign j winning the case depends on the potential 'dumping' activity involved.

The process by which we model the resolution of a trade dispute is similar to that established in Bown (forthcoming). It is fairly simple, but is one which we consider to be institutionally realistic as it has features that are consistent with how the GATT/WTO dispute settlement system works in practice. That is, we assume that if Foreign j wins the case, then the GATT/WTO dispute settlement mechanism authorizes Foreign j compensation in the form of a tariff threat, or a "withdrawal of concessions" limited by the rule of *reciprocity* as defined by Bagwell and Staiger (2001).³¹ Assuming that Home's second period ADDs were the tariff combination of $\{\tau_j^{x,O}, \tau_k^{x,FT}\}$ of (7), reciprocity is defined as follows (as applied to our setting): given an initial state of free trade, a set of tariffs by X and Foreign j , $\{\tau_j^{x,O}, \tau_k^{x,FT}, \tilde{\tau}_X^j\}$, is defined as satisfying the condition of *reciprocity* if the proposed tariff changes bring about equal changes in the volume of X and j 's imports and exports, when valued at existing world prices.³² That is, this definition *implies* that the tariffs $\{\tau_j^{x,O}, \tau_k^{x,FT}, \tilde{\tau}_X^j\}$ then satisfy

³⁰This interpretation of the cost is reminiscent of Kovenock and Thursby's (1992) cost of "international obligation."

³¹To clarify, we should note that Bagwell and Staiger do not utilize the reciprocity definition to address the issue of compensation in trade disputes. In fact, there is some question as to whether the threat of retaliation under the GATT/WTO's dispute settlement provisions is in fact limited by the reciprocity condition, for a discussion see Bown (forthcoming). We will show below, however, that our basic results hold even if reciprocity were not a binding constraint (in which case Foreign j could threaten its Nash tariff, say), and indeed we pursue this question further in our discussion of potential reforms. For a more general discussion on the rules of tariff retaliation serving to balance concessions and compensate in GATT trade disputes, see Dam (1970 pp. 79-81).

³²Referring again to the general equilibrium interpretation of the model, given that world prices are the same as the

the following condition

$$[p_j^x(0,0) - p_j^x(\tau_j^{x,O},0)]q_j^{x,N}(\tau_j^{x,O},0) = [p_X^j(0,0) - p_X^j(\tilde{\tau}_X^j,0)]q_X^{j,N}(\tilde{\tau}_X^j,0) \quad (21)$$

where $q_j^{x,N}(\cdot)$ and $q_X^{j,N}(\cdot)$ are as in (2).³³ We first assume that the reciprocity condition implies a *maximum* level of retaliation that j can threaten. That is, we assume that j 's credible threat for its reciprocity retaliation is $\tau_X^{j,R} \equiv \min \{\tilde{\tau}_X^j, \tau_X^{j,O}\}$, where $\tilde{\tau}_X^j$ is the tariff implicitly defined in (21) and $\tau_X^{j,O} = \alpha^j/22$ is Foreign j 's optimal tariff with respect to X given that it is continuing free trade with k , from (7).

It is sufficient for our purposes to simply characterize some of $\tilde{\tau}_X^j$'s useful properties. First note that when the reciprocity condition of (21) binds so that $\tau_X^{j,R} = \tilde{\tau}_X^j$, by comparing (21) and (9) we have the following

Observation 1 *The Foreign j retaliatory tariff that satisfies the reciprocity condition of (21) will serve to neutralize the terms of trade effect induced by Home's ADD, $\tau_j^{x,O}$.*

On the other hand, the reciprocity condition will fail to bind when even Foreign j 's optimal tariff, $\tau_X^{j,O}$ is not sufficiently large to neutralize the terms of trade effects induced by Home's ADD. That is, (21) will not bind when α^j is relatively too small. We can further characterize the tariff implicitly defined in (21) with³⁴

Proposition 1 *Consider the Foreign j tariff, $\tilde{\tau}_X^j$, implicitly defined in (21). Then $\partial\tilde{\tau}_X^j/\partial\alpha^j < 0$.*

prices received by the exporting firms (given the absence of export policies) the reciprocity condition is *defined* in our setting as

$$p_j^x(0,0)[q_j^{x,N}(\tau_j^{x,O},0) - q_j^{x,N}(0,0)] + M_{Xj}(\tau_j^{x,O},0,\tilde{\tau}_X^j,0) - M_{Xj}(0,0,0,0) = p_X^j(0,0)[q_X^{j,N}(\tilde{\tau}_X^j,0) - q_X^{j,N}(0,0)].$$

where M_{Xj} denotes Home imports of the numeraire good 0_{Xj} . We then proceed in two steps. First, eliminate existing trade volumes from this condition by utilizing the requirement of bilateral balanced trade at the existing set of world prices. Second, use the requirement of balanced trade at the set of world prices determined by the proposed tariffs to eliminate trade in the numeraire good under the proposed tariffs. Given these two conditions, the definition of reciprocity implies the condition found in (21).

³³It is important to note that we do not allow for Home to consider imposing some second period ADD that might be a best response to the reciprocity condition defined in (21). For our purposes we assume that Home imposes its one period optimal tariff of (7).

³⁴The proofs of all propositions are found in the appendix.

One interesting feature of Proposition 1 and (21) is the non-monotonicity of Foreign j 's tariff response, $\tau_X^{j,R}$, with respect to α^j : a sufficiently large α^j is needed for the reciprocity condition of (21) to even bind, but then once the condition binds so that Foreign j is constrained to threaten a retaliation of $\tilde{\tau}_X^j < \tau_X^{j,O} = \alpha^j/22$, then $\tilde{\tau}_X^j$ is actually *decreasing* in the size of the Foreign j market, α^j .

Next, we proceed to a formal characterization of the rest of the trade dispute process. With probability λ_j Foreign j is authorized to make a tariff threat of $\tau_X^{j,R}$. Foreign j 's reciprocity tariff threat is then used in conjunction with Home's second period ADD to identify an expected welfare pair $\{\hat{W}_X, \hat{W}_j\}$ which will serve as a welfare 'benchmark.'³⁵ We then use the benchmark in conjunction with the Nash bargaining procedure to simplify the process by which the countries negotiate back to free trade. We illustrate this negotiating process through Figure 2. To simplify and focus attention on the GATT/WTO rules of retaliation, we also assume equal bargaining power across countries in the Nash bargaining, and with free trade being the ultimate final outcome and the lump sum transfer, the welfare attainable under the panel outcome is illustrated by the 'Panel' frontier, which is linear with slope -1 . It is also important to note that the joint welfare attainable on the 'Panel' frontier is interior to the welfare attainable when Home simply withdraws the ADDs and refunds the duties (i.e. the 'ADD Withdrawal' frontier), given the cost of prosecution and defense in the panel outcome. Therefore, F_X and F_j affect not only the location of the welfare benchmark in the negotiations, but they also affect how far away the 'Panel' welfare frontier rests, relative to the 'ADD Withdrawal' frontier. Finally we note that the free trade welfare is simply $W_X^{FT} = W_X^x(0,0) + W_X^y(0,0) + W_X^z(0,0)$ and $W_j^{FT} = W_j^x(0,0) + W_j^y(0,0) + W_j^z(0,0)$.

One justification for modeling the trade dispute in this manner is its consistency with some of the important features of how the GATT/WTO dispute settlement process transpires in practice, which is the foremost intent of our analysis, given our abstraction away from issues of enforcement. While retaliation is authorizable under the GATT/WTO system, it has formally been carried out in very few occasions (see, as examples, footnote 5), and a more frequent outcome to any dispute is a managed

³⁵Note that the expected welfare at the benchmark is

$$\begin{aligned}\hat{W}_X &= W_X^x(\tau_j^{x,O}, 0) + \lambda_j W_X^j(\tau_X^{j,R}, 0) + (1 - \lambda_j)W_X^j(0,0) + W_X^k(0,0) - F_X \\ \hat{W}_j &= W_j^x(\tau_j^{x,O}, 0) + \lambda_j W_j^j(\tau_X^{j,R}, 0) + (1 - \lambda_j)W_j^j(0,0) + W_j^k(0,0) - F_j.\end{aligned}$$

trade arrangement.³⁶ Alternatively, if the compensation involves a transfer from Home to Foreign j , the transfer could be interpreted as a refunding of a *portion* of the second period tariff revenue that Home collected. If, on the other hand, the compensation involves a transfer from Foreign j to X , rather than an income transfer which we may not observe in actual cases, we interpret this as perhaps Foreign j allowing Home an extended “reasonable period of time” before Home implements the panel ruling to conform its policies and remove the ADDs.³⁷ Whether the equilibrium transfer is positive or negative, the key point is to note that even though Foreign j makes a tariff *threat* which is used along with Home’s second period ADD to establish the welfare benchmark, in the final equilibrium no third period tariffs are actually in place.

It is thus straightforward to show that the transfer from Home to Foreign j when a trade dispute makes it through the panel (P) stage under this structure is simply³⁸

$$T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R}) = \frac{1}{2} \left[\Omega_{Xj}^x(\tau_j^{x,O}, 0) - \lambda_j \Omega_{jX}^j(\tau_X^{j,R}, 0) \right]. \quad (22)$$

We will characterize and discuss $T_{Xj}^P(\cdot)$ momentarily, but before doing so let us turn briefly to a discussion of the dispute settlement process. That is, if Foreign j ’s expected welfare under a panel outcome, $W_j^{FT} - T_{Xj}^P(\cdot) - F_j$, is larger than the welfare it receives were Home to simply continue the imposition of its ADD in the third period, $W_j^x(\tau_j^{x,O}, 0) + W_j^y(0, 0) + W_j^z(0, 0)$, then Foreign j will request a panel. This can be captured by the following:

Observation 2 *Foreign j will only request a panel if $F_j < [\Pi_j^x(0, 0) - \Pi_j^x(\tau_j^{x,O}, 0)] - T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R})$.*

That is, if the combination of the regained profit to its exporters of x in the third period and the

³⁶It would be straightforward to extend our simple model to allow an equilibrium managed trade agreement formally, in a manner similar to that discussed in Bown (forthcoming). By adding political economy features to the model so that equilibrium tariffs were positive, the finalized negotiated outcome would simply entail Home restructuring its original ADD on the firm from j so as to allow the foreign government in j to impose a VER or perhaps engage in *price undertakings*, thereby obtaining compensation in the form of the original ADDs “quota rents.” Such a framework avoids secondary inefficiencies that would be generated by a tariff retaliation, and is a point made in a related context by Ohno (1991).

³⁷This is consistent with the outcomes of disputes such as Korea vs. US over *Stainless Steel Plate* (WTO 2001b), and India vs. EU over *Cotton-Type Bed Linen* (WTO 2001c) where the panel found that the defendant’s AD measures did not conform with their WTO obligations, and the parties to the dispute then negotiated over the period of time for the defendant to conform.

³⁸We formally illustrate the calculation of the transfer in the appendix.

transfer is larger than the cost of pursuing a formal trade dispute and panel outcome, then Foreign j will choose to request a panel.³⁹ Otherwise, if the gains from pursuing a panel are too small, Foreign j will simply not pursue the case any farther. For the rest of this paper, we make the assumption that the condition $F_j < [\Pi_j^x(0,0) - \Pi_j^x(\tau_j^{x,O}, 0)] - T_{Xj}^P$ is satisfied so that Foreign j always finds it in its interest to pursue a panel.

Given that Foreign j will pursue a panel, the next question to consider is Home's decision of whether or not it should settle the dispute before a panel is initiated, where its welfare is $W_X^{FT} + T_{Xj}^D(\tau_j^{x,O})$, given that Foreign j has requested consultations. The other choice for Home is to forego the settlement opportunity and abide by the panel's outcome, where its expected welfare is $W_X^{FT} + T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R}) - F_X$. Our next result can thus be formalized with

Observation 3 *Home will only settle by withdrawing the ADD, refunding second period duties and avoiding the panel outcome if $F_X > T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R}) - T_{Xj}^D(\tau_j^{x,O})$.*

Here the intuition is that, if the cost to Home of being a defendant in a panel is too high, then it will simply choose to settle and avoid a panel outcome. Note that this is less likely when the second period duties collected, $T_{Xj}^D(\cdot)$ of (20), are sizable. In what follows we also assume that $F_X < T_{Xj}^P - T_{Xj}^D$ to allow us to focus on the rules of retaliation under the ultimate panel outcome. Therefore, given that Foreign j will request a panel and that Home will not look to settle the dispute by avoiding the panel and simply refunding the ADD revenue, we can proceed to a characterization of the equilibrium transfers under the panel outcome. First note that,

Proposition 2 *Assume that α^y and α^z are sufficiently small so that both reciprocity conditions of (21) fail to bind. Even if $\lambda^j = 1$, if $c_k^x \geq c_j^x$ then $T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R}) \geq 0$ for $j \neq k \in \{Y, Z\}$.*

This proposition identifies the first problem with the current rules of the dispute settlement system. Consider for a moment, a trade dispute under these conditions against the alternative outcome that no ADD had been imposed so that there were no trade dispute and free trade prevailed in the third period (in which case the implicit third period transfer between Home and j is zero). This proposition states that if both Y and Z are so small in their consumption of goods y and z , respectively, that the reciprocity conditions for their retaliatory tariff threats fail to bind, then Home can always find a

³⁹Note that we can use (12) and $\tau_j^{x,O}$ to rewrite $[\Pi_j^x(0,0) - \Pi_j^x(\tau_j^{x,O}, 0)] = (4/1089)(\alpha^x - 10c_j^x + 8c_k^x)(5\alpha^x - 17c_j^x + 7c_k^x)$, where we note that this is increasing in α^x and c_k^x and decreasing in c_j^x .

partner with whom even the threat of a trade dispute will leave Home better off in the third period than continued free trade. And this result is for the third period only - we have not yet even considered the second period welfare gain that Home would receive from the imposed ADD! Hence for “small” (as measured by α^j) Foreign trading partners, the rules of dispute settlement are not sufficient to deter the imposition of trade dispute-provoking ADDs by Home, even if the trading partner would ‘win’ the dispute with certainty.

Next let us turn back to a discussion of the equilibrium transfer under a panel outcome in order to identify what factors lead Home’s transfer with Foreign Y to be potentially different from that with Foreign Z . We will not attempt to exhaustively characterize the transfers, but instead we will tend to focus primarily on conditions that allow for $T_{XY}^P(\tau_Y^{x,O}, \tau_X^{y,R}) \geq T_{XZ}^P(\tau_Z^{x,O}, \tau_X^{z,R})$.

Proposition 3 *If $c_Z^x > c_Y^x$ and both reciprocity conditions of (21) bind, then $T_{XY}^P > 0$ and there exist parameters such that $T_{XZ}^P < 0$.*

Under the assumption that $c_Z^x > c_Y^x$, a third period trade dispute with Foreign Y will *always* lead to a transfer from Foreign Y to Home, whereas we can find parameter values that would make a trade dispute between Home and Foreign Z result in a transfer from Home to Z . The intuition behind the distinction in the two transfers is the following. Since Home’s *terms of trade gain* in a dispute with either Y or Z is neutralized by the binding reciprocity constraints of (21), it is largely due to the smaller *trade diversion effect* of (11) in the case with Foreign Y , that drives this result. Home would have a smaller *trade diversion effect* with Y relative to a dispute with Z , since with $c_Z^x > c_Y^x$ the firm in Y the low cost producer.⁴⁰

In order to reduce the set of equilibria under consideration in the next section, we will assume $c_Z^x \geq c_Y^x$ and only consider equilibrium parameterizations that allow for $T_{XY}^P \geq T_{XZ}^P$.

4.1.2 A Trade Dispute with Both Partners

Instead of a trade dispute with one partner, assume that Home has now imposed an ADD on second period imports from the exporter of x in Y and in Z , where the ADDs are given by the $\{\tau_Y^{x,T}, \tau_Z^{x,T}\}$

⁴⁰Note that Proposition 3 is not saying that with $c_Z^x > c_Y^x$, that Home would always prefer a trade dispute with Foreign Y to one with Foreign Z . In fact, there are parameter values that make $T_{XZ}^P(\tau_Z^{x,O}, \tau_X^{z,R}) > T_{XY}^P(\tau_Y^{x,O}, \tau_X^{y,R}) > 0$, for example, if neither reciprocity condition binds, it is straightforward to show that $T_{XZ}^P > T_{XY}^P$ if α^z is sufficiently smaller than α^y .

combination of (8). We assume that Foreign Y and Z initiate a joint trade dispute against Home. It simplifies the presentation to assume that Y and Z collaborate in their dispute and share the cost of prosecution (now given by $F_{YZ} \geq 0$), though this assumption does not impact the primary results under analysis in the paper. Note further that we continue to assume that $c_Z^x \geq c_Y^x$.

Given that a panel is convened, we assume that Home will be found to have violated its GATT/WTO obligations (and will face an authorized retaliatory tariff threat) with respect to Y with probability λ_Y and with respect to Z with probability λ_Z . Now we have that the retaliation facing Home is determined by two reciprocity conditions, one with respect to each Foreign trading partner. That is, given an initial state of free trade, a second set of tariffs $\{\tau_Y^{x,T}, \tau_Z^{x,T}, \bar{\tau}_X^y\}$ and $\{\tau_Y^{x,T}, \tau_Z^{x,T}, \bar{\tau}_X^z\}$, respectively, can be shown to satisfy distinct reciprocity conditions with respect to Y and Z if we have the following

$$[p_Y^x(0, 0) - p_Y^x(\tau_Y^{x,T}, \tau_Z^{x,T})]q_Y^{x,N}(\tau_Y^{x,T}, \tau_Z^{x,T}) = [p_X^y(0, 0) - p_X^y(\bar{\tau}_X^y, 0)]q_X^{y,N}(\bar{\tau}_X^y, 0) \quad (23)$$

$$[p_Z^x(0, 0) - p_Z^x(\tau_Y^{x,T}, \tau_Z^{x,T})]q_Z^{x,N}(\tau_Y^{x,T}, \tau_Z^{x,T}) = [p_X^z(0, 0) - p_X^z(\bar{\tau}_X^z, 0)]q_X^{z,N}(\bar{\tau}_X^z, 0). \quad (24)$$

where $q_Y^{x,N}(\cdot)$, $q_X^{y,N}(\cdot)$, $q_Z^{x,N}(\cdot)$, and $q_X^{z,N}(\cdot)$ are as in (2). Again we first assume that the reciprocity condition implies a *maximum* level of retaliation that Y and Z can threaten. That is, we assume that Y 's credible threat for its reciprocity retaliation is $\tau_X^{y,S} \equiv \min\{\bar{\tau}_X^y, \tau_X^{y,O}\}$, where $\bar{\tau}_X^y$ is the tariff implicitly defined in (23) and $\tau_X^{y,O}$ is Foreign Y 's optimal tariff with respect to X given that it is continuing free trade with Z , from (7). Symmetrically, Z 's credible threat for its reciprocity retaliation is $\tau_X^{z,S} \equiv \min\{\bar{\tau}_X^z, \tau_X^{z,O}\}$, where $\bar{\tau}_X^z$ is the tariff implicitly defined in (24) and $\tau_X^{z,O}$ is Foreign Z 's optimal tariff with respect to X given that it is continuing free trade with Y , from (7). We can then make

Observation 4 *The Foreign Y [Z] retaliatory tariff that satisfies the reciprocity condition of (23) [(24)] will serve to neutralize the terms of trade effect on Y [Z] through the imposition of Home's ADDs, $\{\tau_Y^{x,T}, \tau_Y^{x,T}\}$.*

Just like in the one ADD case, here the respective reciprocity conditions will not bind when even the Foreign optimal tariff is not sufficiently large to neutralize the terms of trade effects induced by Home's ADDs. Further, when comparing the reciprocity tariffs implicitly defined in (21) to (23) and (24) we can state

Observation 5 *Since the terms of trade effect induced by Home in the two-country ADD case, given by (16), is larger than the terms of trade effect induced by Home in the one-country ADD case, given by (9), it is straightforward to show that $\bar{\tau}_X^j > \tilde{\tau}_X^j$.*

Next, we move on to a formal characterization of the rest of the trade dispute process. With probability λ_Y (λ_Z) Foreign Y (Z) is authorized to make a tariff threat in the two-country ADD case of $\tau_X^{y,S}$ ($\tau_X^{z,S}$). For simplicity we assume that λ_Y and λ_Z are independent, though this assumption can easily be modified. The process by which we reach the transfer follows a similar route to that identified in the last section, but we relegate the formal steps to an appendix. The net equilibrium transfer from Y and Z to Home under a two country panel outcome can be shown to be

$$T_{XYZ}^P = \frac{1}{2} \left\{ \Omega_{XYZ}^x(\tau_Y^{x,T}, \tau_Z^{x,T}) - \lambda_Y \left[\Omega_{YX}^y(\tau_X^{y,S}, 0) + \frac{2}{9} \tau_X^{y,S} (\alpha^y + \tau_X^{y,S}) \right] - \lambda_Z \left[\Omega_{ZX}^z(0, \tau_X^{z,S}) + \frac{2}{9} \tau_X^{z,S} (\alpha^z + \tau_X^{z,S}) \right] \right\}, \quad (25)$$

where $\Omega_{XYZ}(\cdot)$, $\Omega_{YX}(\cdot)$, and $\Omega_{ZX}(\cdot)$ are determined in (19) and (15) and the other two terms of (25) are the *profit diversion* to Z (from Y 's tariff increase on imports from the firm in X in the y sector) and *profit diversion* to Y (from Z 's tariff increase on imports from the firm in X in the z sector) as in (13). In the one country trade dispute against Y , [see $T_{Xj}^P(\cdot)$ of (22)] these profit diversion effects were not included as Foreign Y and Z were not joint plaintiffs. In fact, Z actually enjoys improved welfare through the trade diversion effect when Home imposes an ADD on the firm in Y only. Therefore, in the one country dispute, there is no reason for Foreign Y to account for the profit diversion enjoyed by Z in its welfare calculation. This profit diversion is relevant in the two-country dispute, as we are looking at Foreign Y and Foreign Z 's joint welfare, therefore it is necessary to consider the profit diversion that Y 's tariff yields to Z and the profit diversion that Z 's tariff yields to Y . Finally, note that the transfer that would occur if Home had refunded the second period duties (D) to Y and Z is⁴¹

⁴¹Then we have analogous propositions to the earlier ones that we won't pursue here. That is, Foreign Y and Z will pursue a panel if the joint cost of prosecution, F_{YZ} , isn't too large, relative to the gains from the panel outcome. As well, Home will not settle by withdrawing the ADDs and refunding the collected duties provided F_X is not too large. We therefore assume that F_X and F_{YZ} are sufficiently small to ensure a panel outcome. Finally, we should also note that we do not investigate here the outcome that Home might choose to avoid the panel outcome with one country and not with the other, leaving such extensions for future work.

$$\begin{aligned}
T_{XYZ}^D &\equiv - \left[\tau_Y^{x,T} \cdot q_Y^{x,N}(\tau_Y^{x,T}, \tau_Z^{x,T}) + \tau_Z^{x,T} \cdot q_Z^{x,N}(\tau_Y^{x,T}, \tau_Z^{x,T}) \right] \\
&= -\frac{1}{16}(\alpha^{x^2} - 2\alpha^x c_Y^x - 2\alpha^x c_Z^x + 5c_Y^{x^2} - 6c_Y^x c_Z^x + 5c_Z^{x^2}).
\end{aligned} \tag{26}$$

4.1.3 Comparing the Panel Transfers in the One- and Two-Plaintiff Country Disputes

As we will discuss in detail in the next section, in most circumstances the rules of dispute settlement on their own are not able to effectively discourage the imposition of ADDs. In fact, given the full, three period model, we will show that Home generally finds it in its interest to impose ADDs against both of the exporters of x .

Consider for a moment the following thought experiment. Assume that the model were not the three period model, but instead were only a one period model consisting of this third period trade dispute phase. Suppose that under this scenario Home had to choose among (i) imposing an ADD versus one country only, (ii) imposing an ADD versus both, and (iii) not imposing an ADD at all.

Why consider such a thought experiment? We feel that this exercise is worth investigating for at least two reasons. First, some trade disputes are actually initiated during the national AD authority's *investigation* stage,⁴² where the threat of an immediate WTO panel may have the ability to influence an AD authority to terminate an investigation without even imposing ADDs. Second, if countries are perhaps statutorily compelled (or under political pressure) to impose ADDs against a trading partner but, perhaps due to the cumulation rule which rewards 'over-naming' have some discretion *against whom* the ADDs might be imposed, the national AD authority may be interested in minimizing the costs associated with a potential trade dispute driven by the imposition of politically motivated (and GATT/WTO unacceptable) ADDS. The question that we address is, when focusing on the third period alone, does this model suggest that there would be an occasion when Home would prefer to have imposed a second-period ADD against *one* of its trading partners as opposed to *both* and *none*? We can answer this question in the affirmative with the following illustrative example

Proposition 4 *Assume α^z is sufficiently large so (24) binds and α^y is sufficiently small so that Foreign Y's reciprocity tariff of (21) binds with equality at $\tau_X^{y,R} = \tilde{\tau}_X^y = \tau_X^{y,O} = \alpha^y/22$. Then if $\lambda_Y = \lambda_Z = 1$ and $c_Z^x > c_Y^x$, there exists a third period equilibrium where $T_{XY}^P > T_{XYZ}^P$, $T_{XY}^P > 0$, and $T_{XY}^P > T_{XZ}^P$.*

⁴²See, for example, Mexico's dispute with Venezuela over *Certain Oil Country Tubular Goods* (WTO 1997).

While we relegate the formal proof to an appendix, we highlight the significance of this result and the intuition behind it here. This result states that, in a trade dispute, with a relatively low α^y and high α^z , we can find parameters to sustain an equilibrium where Home prefers a panel outcome with Foreign Y alone to all other outcomes. As well, this incentive exists regardless of the dumping activity that has taken place and even if Home is aware that it will lose the dispute with certainty. That is, $T_{XY}^P > 0$ indicates that the rules of dispute resolution of the GATT/WTO system are not sufficient to discourage Home from imposing even the most (statutorily) dubious of ADDs on Foreign Y . Furthermore, with the result that $T_{XY}^P > T_{XYZ}^P$, the rules can be interpreted as having generated an incentive for Home to discriminate between exporters in Foreign Y and Z based on the fact that Foreign Z has the *capacity* to retaliate (through a relatively higher α^z that causes (24) to bind) while Foreign Y does not. As was suggested by Proposition 3, $T_{XY}^P > T_{XZ}^P$ so that Home prefers an ADD with Y to one with Z because Foreign Y is the low cost producer and there is thus a smaller trade diversion effect.

The economic intuition behind this proposition is fairly straightforward and can be further understood by appealing to the components of T_{XY}^P and T_{XYZ}^P of (22) and (25), respectively, that were decomposed earlier. By comparing Ω_{XYZ} of (19) and Ω_{XY} of (14), Home does improve its bargaining position in the x sector more under the two-ADD case than in the one-ADD case, as its imposition of an ADD against both trading partners (as opposed to just one) causes it to suffer no *trade diversion effect* in the x sector, and instead it enjoys *terms of trade gains* with respect to both Y and Z . These effects work against the above result. However, in this parameterization, because the reciprocity conditions of (21) and (24) bind, by Observations 1 and 4, much of Home's terms of trade gains in the x sector are neutralized by the Foreign Y and Z threatened response. In addition to this, in T_{XYZ}^P of (25), the traditional *trade diversion* effects in the y [z] market through Foreign Y 's [Z 's] response of $\bar{\tau}_X^y$ [$\bar{\tau}_X^z$] are now captured by the third partner, Foreign Z [Y]. This is not true in the one-ADD case where Home is negotiating with Y only.

4.2 Period 2 - The Antidumping Duty Decision

When we consider the full three period model, the antidumping decision made by Home in the second period is not made by comparing T_{XY}^P and T_{XYZ}^P alone, but by also taking into consideration the differences in second period welfare when Home imposes one ADD as opposed to two. Let the second period welfare gains to Home in the one and two ADD cases be given by, respectively

$$\omega_{XY}(\tau_Y^{x,O}, 0) \equiv W_X^x(\tau_Y^{x,O}, 0) - W_X^x(0, 0) = \frac{1}{396}(\alpha^x - 10c_Y^x + 8c_Z^x)^2 \quad (27)$$

$$\begin{aligned} \omega_{XYZ}(\tau_Y^{x,T}, \tau_Z^{x,T}) &\equiv W_X^x(\tau_Y^{x,T}, \tau_Z^{x,T}) - W_X^x(0, 0) \\ &= \frac{1}{72}(\alpha^{x^2} - 2\alpha^x c_Y^x - 2\alpha^x c_Z^x + 19c_Y^{x^2} - 34c_Y^x c_Z^x + 19c_Z^{x^2}) \end{aligned} \quad (28)$$

Clearly the second period welfare gain from imposing one ADD of (27) is less than what Home achieves when it imposes ADDs against both Y and Z of (28). In fact, when taking into consideration the welfare effects of the third *and* second periods, letting $\delta \leq 1$ be the discount rate on third period welfare, we have the following

Observation 6 *In the three period model, Home prefers ADDs against both trading partners to an ADD against Y only, provided $\omega_{XYZ}(\tau_Y^{x,T}, \tau_Z^{x,T}) + \delta T_{XYZ}^P > \omega_{XY}(\tau_Y^{x,O}, 0) + \delta T_{XY}^P$, and Home prefers an ADD against both Y and Z to ADDs against neither provided $F_X < \omega_{XYZ}(\tau_Y^{x,T}, \tau_Z^{x,T}) + T_{XYZ}^P$.*

In relation to our discussion of the last section, it is now straightforward to show that even for the parameterization of Proposition 4 that led to the $T_{XY}^P > T_{XYZ}^P$, when we consider the full model (even with $\delta = 1$), Home prefers to apply ADDs to imports from both countries. The intuition is simply that the third period transfers are dominated by the unchecked welfare gains in the second period, and these welfare gains are largest when Home imposes ADDs against both trading partners. Therefore, in the full model, the rules of the dispute settlement process are generally insufficient to dissuade Home from pursuing ADDs with respect to both of its trading partners, whenever the cost to Home of facing a panel isn't too large.⁴³

In one sense, the result captured in this observation illustrates the limitations of the model. Observation 6 suggests that, given the recourse available under the rules of the dispute settlement system alone, we shouldn't be surprised to observe the proliferation of ADDs, and in fact, we should be surprised that we don't perhaps observe more! However, our exercise of the last section illustrated how,

⁴³Note that the two-country trade dispute analog to Observation 3 is that Home will only settle by withdrawing the ADD and refunding second period duties to both Y and Z if $F_X > T_{XYZ}^P - T_{XYZ}^D$. By inspection of Figure 1b., the second period welfare gain in the two-country ADD case [$\omega_{XY}(\tau_Y^{x,T}, \tau_Z^{x,T})$] is smaller than the tariff revenue collected in the two-country ADD case [$-T_{XYZ}^D$]. Therefore, ignoring for a moment our earlier assumption on the size of F_X , we should note that it would be possible to sustain an equilibrium where Home finds it advantageous to impose a second period ADD against both trading partners (satisfying Observation 6) *and* to have it settle the dispute before a panel was convened in the third period (satisfying $F_X > T_{XYZ}^P - T_{XYZ}^D$).

when there is no “second period” (i.e. the dispute settlement process is able to proceed before Home actually enjoys a period of ADDs with no threat of retaliation), then there exist conditions such that Home finds it preferable to discriminate and impose ADDs against one partner in lieu of ADDs versus both. On the other hand, the results of the three period model illustrate starkly the fundamental weakness in the current set of rules of the GATT/WTO dispute settlement system. Even when generously interpreted, the current set of rules and procedures for compensation in trade disputes does little to deter countries from abusing national AD measures.

Finally, we note that our framework can be used to identify where some of the weakness in the system rests in order to provide a setting in which we can consider changes to the dispute settlement rules that might generate a more successful deterrent to the frivolous imposition of ADDs. This is the focus of section 5 below. Before we turn to the question of reform, however, we last consider the question of whether the GATT/WTO dispute settlement rules might induce ‘dumping’ behavior on the part of firms.

4.3 Period 1 - The Dumping Decision

Will either of the duopolist exporters in Y or Z dump? That is, do the rules of dispute settlement create an incentive for dumping behavior in any way? Our results suggest that this is not the case, and for the following reasons. First, the firm in Y will clearly not dump. By construction, the exporter in Y faces the ADD (and is clearly worse off) under the parameterization that might allow Home to consider discriminating between exporters and imposing one-ADD only.

The final question is will the firm in Z dump?⁴⁴ As we assumed earlier, suppose that λ_Y is decreasing in the potential dumping activity by the duopolist in Foreign Z , in the sense that dumping by any firm causes confusion and increases the likelihood that Foreign Y would lose a potential trade dispute that it would bring against Home in period 3. Our initial response might be that the firm in Z could choose to dump to increase this likelihood (provided the parameters lined up as in Proposition 4) because in the

⁴⁴This question is reminiscent of the points made by Blonigen and Ohno (1998) and Prusa (1994). Blonigen and Ohno (1998) have suggested that foreign exporters may voluntarily dump to induce AD measures against rival exporters, when the dumping firm is planning to undertake FDI (instead of exporting) in the following period so that it will avoid the ADDs. Prusa (1994), on the other hand, in a one Home firm and one Foreign firm Bertrand rivalry, finds an incentive for the Home firm to dump and “injure” itself in the first period to induce an ADD against a rival in order to obtain larger second period profits.

one-ADD case between Home and Y , the firm in Z appears to gain due to the *profit diversion* of (13). However, the third period dispute settlement phase contains only “threats” of retaliation and tariffs and therefore no realized *profit diversion* in equilibrium. Therefore, the only realized profit diversion that could potentially take place in the model would have to happen during the second period. But we have argued that the same conditions that allow for Home to prefer imposing an ADD against Y only when considering *only* the third period generate an equilibrium where Home actually prefers to impose ADDs against both trading partners when a second period exists. And under this two-country ADD outcome, the duopolist firm in Z clearly is worse off, relative to free trade. Therefore, we find little evidence in this model to suggest that the current rules of dispute settlement generate an incentive for one firm to dump to increase the chance of ADDs against a rival exporter.

5 Potential Reforms

In this section we briefly consider a simple proposal of reform to the rules of the dispute settlement system with respect to cases involving the allegations of abuse of national AD provisions.

In lieu of the current rules of dispute settlement where the final compensation is ultimately negotiated under the GATT/WTO authorized threat of tariff retaliation, suppose that Home were *required* to refund the second period tariff revenue in any lost formal trade dispute.⁴⁵ What would be the impact on the trade dispute process? Would there be an affect on the pattern of ADDs and/or the likelihood that they would be imposed?

First, if we focus solely on the third period transfers alone, we have that $T_{XY}^D < 0$ and $T_{XYZ}^D < 0$ from (20) and (26), respectively. But even comparing this outcome to Proposition 2, this compensation scheme would serve to help even the “small” (as measured by α^j) Foreign trading partners who in the ‘retaliation-as-compensation’ system always faced $T_{XY}^P > 0$. Second, in considering the full three period model, if, for a moment we assume $\delta = 1$ and $\lambda_Y = \lambda_Z = 1$, we can show that both that $\omega_{XY}(\tau_Y^{x,O}, 0) + T_{XY}^D < 0$ and $\omega_{XYZ}(\tau_Y^{x,T}, \tau_Z^{x,T}) + T_{XYZ}^D < 0$. That is, even when taking into consideration the second period welfare gain that Home receives through the imposition of ADD(s), this result suggests that the mandatory refunding of duties would arguably better serve to discourage Home from imposing frivolous ADDs, relative to the current rules and procedures.⁴⁶

⁴⁵For example, suppose that any revenue collected under ADDs that were challenged by a formal trade dispute were put into an escrow account that would ultimately be distributed after the resolution of the dispute.

⁴⁶With $T_{XY}^D > T_{XYZ}^D$, we should also note that this proposal does not fully solve the issue identified in Proposition 4

6 Conclusion

This paper takes a first step toward considering how the rules of dispute settlement under the GATT/WTO system impact national antidumping decisions. We consider a stylized model of rival foreign firms in the presence of antidumping provisions and trade disputes that address the misuse of national AD provisions. We show how the ‘retaliation-as-compensation’ approach of the current GATT/WTO dispute settlement system can induce an asymmetric equilibrium in the sense of national administration of asymmetric ADDs, providing a theoretical motivation for another factor that may serve to influence the *structure* of administered protection when ADD authorities are able to exercise discretion. We illustrate the conditions that make it likely for disputes to settle before the initiation of a panel, and we also explore why the current system of dispute settlement may have difficulty in acting to successfully deter the frivolous imposition of ADDs.

The theory presented here has ready empirical implications for researchers analyzing AD decisions and filing activity that will serve to assess its validity. For example, one would expect to find that, when they have the discretion, AD authorities in their accept/reject decision are not only considering the evidence that a foreign firm dumped, that a domestic firm was injured, or that there are political economy factors at stake, but the theory suggests that they are also likely considering the prospect of repercussions to any ADDs through the foreign firm’s national government making a credible threat of retaliation under the rules of the GATT/WTO system.⁴⁷ Relevant observables that would gauge this foreign capacity for retaliation would be the size of Home exports to foreign markets, as well as perhaps the foreign country’s (pre-retaliation) levels of tariff and non-tariff protection. As we have noted, this framework might also be used as an additional explanation as to why some affirmative AD petitions result in price undertakings or VERs as opposed to ADDs. Finally, one might also expect that domestic industry would recognize that their petition would be more likely to be accepted if it *named* firms from countries that were relatively weak and did not name firms from countries which were relatively strong. This may then affect the filing patterns of firms that lodge AD petitions, contributing to the bias in AD petitions received.⁴⁸ However, in terms of caveats, the theory does not differentiate that the rules generate an incentive for Home to discriminate between trading partners when imposing ADDs. However, this point is certainly less important if $\omega_{XY} + \delta T_{XY}^D < 0$ and $\omega_{XYZ} + \delta T_{XYZ}^D < 0$, as then Home would impose ADDs against neither one firm nor both (it would prefer free trade) making the comparison of the relative sizes of T_{XY}^D and T_{XYZ}^D irrelevant.

⁴⁷This question is addressed in the empirical investigation of Blonigen and Bown (forthcoming).

⁴⁸If there is some cost to increasing the number of foreign countries named in related petitions, we conjecture that

between the filing decision of domestic firms and the ADD decision of the national government.

Finally, the analysis undertaken here has implications for discussions on substantive reform of national AD provisions. That is, suppose that WTO members were able to negotiate what economists might consider to be more reasonable guidelines for statutory definitions of ‘material injury’ or even ‘dumping’ in national AD provisions. Seen against the backdrop of dispute settlement in the GATT/WTO system, this model illustrates the underlying influence that the ‘retaliation-as-compensation’ approach has on the potential bias in the use of such national provisions. We would thus argue that any reforms which do not simultaneously affect the WTO rules on dispute settlement may have a smaller-than-desired effect on changes to the composition of petition filings and AD decisions that are seen to be biased against firms from these “small” countries.

this may be seen as working against the effect of the “cumulation” rule which by itself suggests that domestic industry might want to name firms from as many foreign countries as possible to increase the likelihood of a positive injury determination.

Appendix

Proof of Proposition 1

To show that $\partial \tilde{\tau}_X^j / \partial \alpha^j < 0$, use the definition of $\tau_Y^{x,O}$ of (7) in (21) along with the implicit function theorem and the knowledge that $\tilde{\tau}_X^j < \tau_X^{j,O} = \alpha^j / 22$ when reciprocity binds. **Q.E.D.**

Determining $T_{Xj}^P(\tau_j^{x,O}, \tau_X^{j,R})$

Given the definition of $\{\hat{W}_X, \hat{W}_j\}$ (see footnote 35) and the equation of the ‘Panel Frontier’ through the point $\{W_X^{FT} - F_X, W_j^{FT} - F_j\}$, it is straightforward to show that Home’s welfare at point P on Figure 2 is simply

$$\begin{aligned} W_X^P &= \frac{1}{2} \left\{ \left[(W_X^x(\tau_Y^{x,O}, 0) + W_X^x(0, 0)) - (W_Y^x(\tau_Y^{x,O}, 0) - W_Y^x(0, 0)) \right] \right. \\ &\quad \left. - \lambda_Y \left[(W_Y^y(\tau_X^{y,R}, 0) - W_Y^y(0, 0)) - (W_X^y(\tau_X^{y,R}, 0) - W_X^y(0, 0)) \right] \right\} + W_X^y(0, 0) + W_X^z(0, 0) - F_X \end{aligned}$$

Since we’ve also *defined* the transfer to be $W_X^P = (W_X^{FT} - F_X) + T_{Xj}^P$, we use the definitions of $\Omega_{Xj}(\cdot)$ and $\Omega_{jX}(\cdot)$ in (14) and (15) to rewrite this as the form given in (22) given in the text.

Proof of Proposition 2

Use $\tau_Y^{x,O}$ and $\tau_X^{j,O}$ of (7) and the definitions of $\Omega_{Xj}(\cdot)$ and $\Omega_{jX}(\cdot)$ in (14) and (15) in (22) to find

$$T_{Xj}^P = \frac{1}{2} \left[\frac{1}{4356} \left(91\alpha^{x^2} - 1292\alpha^x c_j^x + 928\alpha^x c_k^x + 3820c_j^{x^2} - 5056c_j^x c_k^x + 1600c_k^{x^2} - 91\alpha^{j^2} \right) \right]. \quad (29)$$

Note that in general we can also use the values for $\tau_Y^{x,O}$ and $\tau_X^{j,O}$ of (7) to rewrite the reciprocity condition of (21), when it is (weakly) non-binding as

$$\frac{1}{363} (3\alpha^{x^2} - 38\alpha^x c_j^x + 26\alpha^x c_k^x + 80c_j^{x^2} - 84c_j^x c_k^x + 16c_k^{x^2}) \geq \frac{\alpha^{j^2}}{121} \quad (30)$$

In this case, since (30) is nonbinding, we can solve this inequality for α^{j^2} , and then using this in (29) we have

$$T_{Xj}^P > \frac{1}{2} \left[\frac{19}{594} (c_k^x - c_j^x) (\alpha^x - 10c_j^x + 8c_k^x) \right] \geq 0$$

given the assumption that $(c_k^x \geq c_j^x)$ and using (7) to rule out import subsidies. **Q.E.D.**

Determining $T_{XYZ}^P(\tau_Y^{x,T}, \tau_Z^{x,T}, \tau_X^{y,S}, \tau_X^{z,S})$

Given the expected welfare of the benchmark in the two-ADD case of

$$\begin{aligned}\hat{W}_X &= W_X^x(\tau_Y^{x,T}, \tau_Z^{x,T}) + \sum_{j \in \{Y, Z\}} \left[\lambda_j W_X^j(\tau_X^{j,S}, 0) + (1 - \lambda_j) W_X^j(0, 0) \right] - F_X \\ \hat{W}_Y + \hat{W}_Z &= \sum_{j \in \{Y, Z\}} \left[\left(W_j^x(\tau_Y^{x,T}, \tau_Z^{x,T}) \right) + \lambda_j \left(W_Y^j(\tau_X^{j,S}, 0) + W_Z^j(\tau_X^{j,S}, 0) \right) \right. \\ &\quad \left. + (1 - \lambda_j) \left(W_Y^j(0, 0) + W_Z^j(0, 0) \right) \right] - F_{YZ}\end{aligned}$$

Home's welfare at point P on Figure 2 (where $W_j = W_Y + W_Z$ is the horizontal axis) is now

$$\begin{aligned}W_X^P &= \frac{1}{2} \left\{ \left(W_X^x(\tau_Y^{x,T}, \tau_Z^{x,T}) + W_X^x(0, 0) \right) - \sum_{j \in \{Y, Z\}} \left(W_j^x(\tau_Y^{x,T}, \tau_Z^{x,T}) - W_j^x(0, 0) \right) \right. \\ &\quad \left. - \sum_{j \in \{Y, Z\}} \lambda_j \left[\left(W_Y^j(\tau_X^{j,S}, 0) - W_Y^j(0, 0) \right) + \left(W_Z^j(\tau_X^{j,S}, 0) - W_Z^j(0, 0) \right) - \left(W_X^j(\tau_X^{j,S}, 0) - W_X^j(0, 0) \right) \right] \right\} \\ &\quad + W_X^y(0, 0) + W_X^z(0, 0) - F_X\end{aligned}$$

Since the transfer in the two-ADD case is defined as be $W_X^P = (W_X^{FT} - F_X) + T_{XYZ}^P$, we use the definitions of $\Omega_{XYZ}(\cdot)$ and $\Omega_{jX}(\cdot)$ in (19) and (15) to rewrite this as the form given in (25) given in the text.

Proof of Proposition 3

When the reciprocity conditions bind, by Observation 1, the terms of trade effects are neutralized.

Therefore, we can rewrite T_{Xj}^P whenever these bind for $j \in \{Y, Z\}$ as

$$T_{Xj}^P = \frac{1}{2} \left[ER \text{ Effect vs. } j - TD \text{ Effect} - DWL \text{ Effect} - (1/2) \cdot TOT \text{ Effect vs. } j - (1/9) \cdot \tilde{\tau}_X^{j^2} \right],$$

where $ER \text{ Effect vs. } j$ is as in (12), $TD \text{ Effect}$ is as in (11), $DWL \text{ Effect}$ is as in (10), $TOT \text{ Effect vs. } j$ is as in (9), and finally $\tilde{\tau}_X^j$ is the tariff defined in (21). We can use these equations to rewrite this as

$$T_{Xj}^P = \frac{1}{2} \left[\frac{1}{4356} (\alpha^x - 10c_j^x + 8c_k^x) (\alpha^x - 142c_j^x + 140c_k^x) - \frac{1}{9} \tilde{\tau}_X^{j^2} \right]. \quad (31)$$

Again use the reciprocity condition of (30) but now take this right where it binds with equality at $\tilde{\tau}_X^j = \tau_X^{j,O} = \alpha^j/22$. Then inserting this into (31) yields

$$T_{Xj}^P = \frac{1}{2} \left[\frac{19}{594} (c_k^x - c_j^x) (\alpha^x - 10c_j^x + 8c_k^x) \right] \quad \text{for } j \neq k. \quad (32)$$

First assume $j = Y$. Then T_{XY}^P of (32) is positive, since we have assumed that $c_Z^x > c_Y^x$. But since $\partial \tilde{\tau}_X^y / \partial \alpha^y < 0$ by Proposition 1, by (31), $T_{XY}^P > 0$ whenever (21) binds.

Now assume $j = Z$. Then T_{XZ}^P of (32) is negative right at this point where reciprocity binds and $\tilde{\tau}_X^z = \tau_X^{z,O}$, under the assumption that $c_Z^x > c_Y^x$. **Q.E.D.**

Proof of Proposition 4

(i) First show that under these conditions $T_{XY}^P(\tau_Y^{x,O}, \tilde{\tau}_X^y) > T_{XYZ}^P(\tau_Y^{x,T}, \tau_Z^{x,T}, \tau_X^{y,O}, \tilde{\tau}_X^z)$.

Note that we can use the assumption that the reciprocity condition with respect to Z is binding to rewrite this as the following

$$\begin{aligned} T_{XY}^P - T_{XYZ}^P &= \frac{1}{2} \left[\left(\frac{1}{4356} (\alpha^x - 10c_Y^x + 8c_Z^x) (91\alpha^x - 382c_Y^x + 200c_Z^x) - \frac{91}{4356} \alpha^{y^2} \right) \right. \\ &\quad \left. - \left(\frac{1}{192} (5\alpha^{x^2} - 66\alpha^x c_Y^x + 46\alpha^x c_Z^x + 169c_Y^{x^2} - 206c_Y^x c_Z^x + 57c_Z^{x^2}) - \frac{137}{4356} \alpha^{y^2} - \frac{11}{9} \tilde{\tau}_x^{z^2} \right) \right] \end{aligned} \quad (33)$$

Then using algebra, the assumption that $\tilde{\tau}_X^y = \tau_X^{y,O} = \alpha^y/22$ and (30), we insert this into (33) to find

$$\begin{aligned} T_{XY}^P - T_{XYZ}^P &= \frac{1}{2} \left[\frac{1}{209088} \left(1131\alpha^{x^2} - 18110\alpha^x c_Y^x + 13586\alpha^x c_Z^x \right. \right. \\ &\quad \left. \left. + 58199c_Y^{x^2} - 80178c_Y^x c_Z^x + 26503c_Z^{x^2} \right) + \frac{11}{9} \tilde{\tau}_x^{z^2} \right] > 0, \end{aligned}$$

since $\tilde{\tau}_X^z > 0$ and assuming $\alpha^x > 3c_Y^x - c_Z^x$, given (8) and our assumption ruling out import subsidies.

(ii) To show $T_{XY}^P(\tau_Y^{x,O}, \tilde{\tau}_X^y) > 0$, see the proof of Proposition 3.

(iii) Finally, show that there exist parameters such that $T_{XY}^P(\tau_Y^{x,O}, \tilde{\tau}_X^y) > T_{XZ}^P(\tau_Z^{x,O}, \tilde{\tau}_X^z)$.

Here we follow the intuition of Proposition 3 to show that $T_{XZ}^P < 0$, but we cannot simply rely on the implications of that proposition, because we have only proven that $T_{XZ}^P < 0$ of (32) at the boundary

where $\tilde{\tau}_X^z = \tau_X^{z,O}$, which is not a feasible parameter consideration here since we have assumed that $\tilde{\tau}_X^z$ binds and we know from Observation 5 that $\tilde{\tau}_X^z > \tau_X^z$. Therefore, let's take the level of α^z such that (24) binds at $\tilde{\tau}_X^z = \tau_X^{z,O} = \alpha^z/22$.

Take, for example, the values of $\alpha^x = 1$, $c_Z^x = 1/20$, and $c_Y^x = 1/25$. With (24) binding at $\tilde{\tau}_X^z = \tau_X^{z,O} = \alpha^z/22$, these parameters imply a level for the Z market of $\hat{\alpha}^z \approx 0.9092$ and with (21) binding at $\tilde{\tau}_X^y = \tau_X^{y,O} = \alpha^y/22$ these parameters imply a level for the Y market of size $\hat{\alpha}^y \approx 0.8582$. It is straightforward to then use (21) to calculate $\tilde{\tau}_X^z \approx 0.0355$ (which is less than $\tau_X^{z,O} = \hat{\alpha}^z/22$, so that constraint is satisfied) and therefore by definition of T_{XZ}^P of (31), we have $T_{XZ}^P < 0$. **Q.E.D.**

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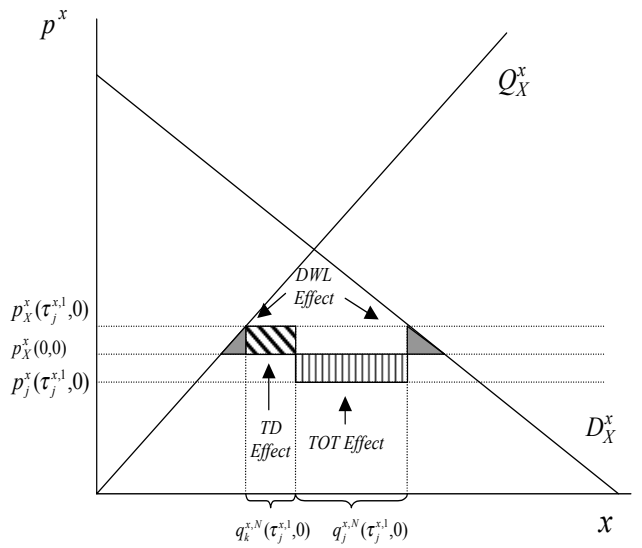
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Table 1: GATT/WTO Trade Disputes that Concerned Claims of Misuse of National Antidumping Measures, 1989-2001

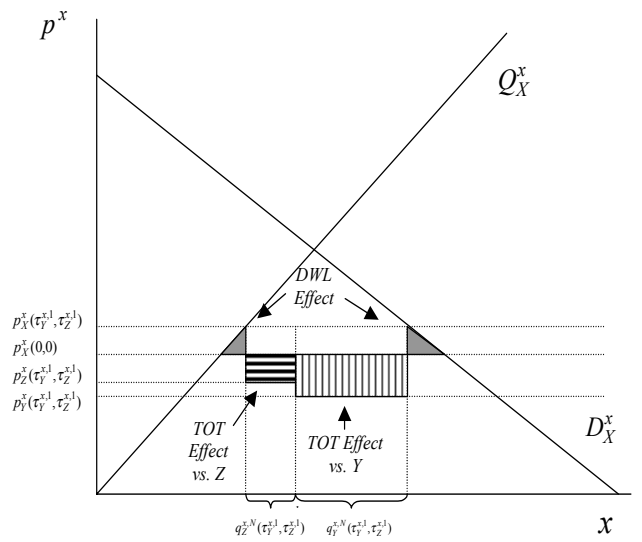
	Country Imposing the AD Duty	Complainant	Good(s)
1	US	Sweden	Seamless Steel Hollow Products [†]
2	US	Mexico	Cement [†]
3	US	Norway	Fresh and Chilled Atlantic Salmon [†]
4	Korea	US	Polyacetal Resins [†]
5	EC	Japan	Audio Tapes in Cassettes [†]
6	EC	Brazil	Cotton Yarn [†]
7	Guatemala	Mexico	Cement
8	US	Korea	Semiconductors
9	Mexico	US	High-Fructose Corn Syrup
10	EC	India	Cotton Bed Linen
11	Thailand	Poland	Angles, Shapes and Sections of Iron or Non-Alloy Steel, H-Beams
12	US	Korea	Stainless Steel Plate in Coils, Sheet and Strip
13	US	Japan	Certain Hot-Rolled Steel Products
14	Ecuador	Mexico	Cement
15	Argentina	EC	Carton Board Imports from Germany and Ceramic Floor Tiles from Italy
16	Trinidad and Tobago	Costa Rica	Macaroni and Spaghetti
17	South Africa	India	Certain Pharmaceutical Products
18	Argentina	EC	Drill Bits from Italy
19	EC	India	Unbleached Cotton Fabrics
20	US	EC	Solid Urea from the Former GDR
21	US	Korea	Colour TVs
22	Australia	Switzerland	Coated Woodfree Paper Sheets
23	US	Mexico	Fresh or Chilled Tomatoes
24	Venezuela	Mexico	Certain Oil Country Tubular Goods
25	US	EC	Seamless Pipe from Italy
26	Brazil	EC	Cast Iron Tube or Pipe Fittings
27	Brazil	Mexico	Electric Transformers
28	Philippines	Korea	Polypropylene Resins
29	Egypt	Turkey	Steel Rebar
30	Turkey	Brazil	Steel and Iron Pipe Fittings
31	US	India	Steel Plate
32	Argentina	Brazil	Poultry
33	US	Japan	Carbon Steel Flat Products
34	US	Canada	Softwood Lumber

Source: Compiled by the author from WTO (1995) and WTO (2002).

[†] Disputes arising between 1989-1994 under the Tokyo Round's "Antidumping Code," all other disputes were brought before the WTO's DSU.



a. Welfare Effects with a Tariff Increase Against Foreign j Only



b. Welfare Effects with a Tariff Increase Against Both Countries

Figure 1: Home Welfare Effects Resulting from a Unilateral Policy Change

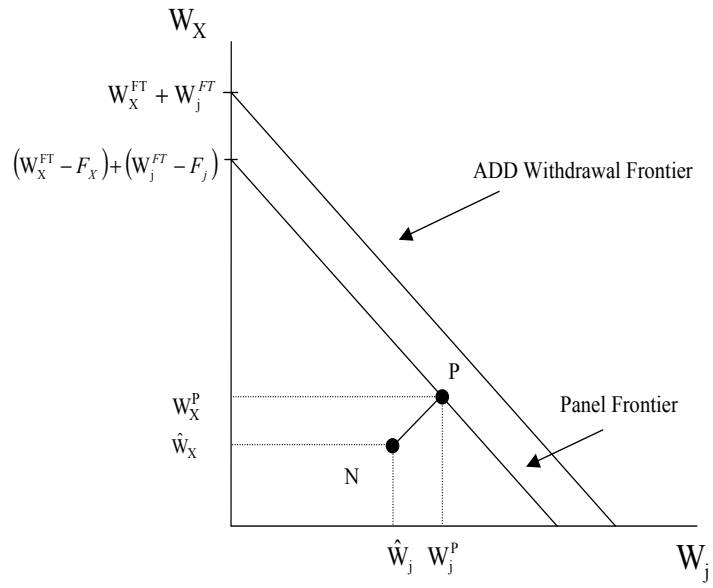


Figure 2: Trade Disputes: The Nash Benchmark and Negotiations