

ON THE ECONOMIC SUCCESS OF GATT/WTO DISPUTE SETTLEMENT

Chad P. Bown*

Abstract—What features of the dispute settlement process help governments live up to their trade liberalization commitments? Exploiting data on GATT/WTO trade disputes initiated and completed between 1973 and 1998, this paper identifies economic and institutional determinants that help defendant governments commit to liberalizing trade. We find substantial evidence consistent with the theory that power measures, including threat of retaliation by the plaintiff, yield credibility to allow defendant governments to live up to their commitments. We find only limited evidence, however, that particular procedural or institutional features beyond the basic GATT/WTO dispute settlement forum itself contributed to the successful economic resolution of trade disputes.

I. Introduction

WHAT features of the dispute settlement provisions of the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) help governments live up to their trade liberalization commitments? As a government struggles to implement the liberalization commitments made in an earlier GATT negotiating round and finds itself faced with a trade dispute, are there particular features of the dispute settlement process that help it credibly commit to freer trade? For example, do defendant countries rely on the threat of retaliation by the plaintiff trading partner? Does the stigma of a possible legal rebuke by the international community induce economic compliance?

This paper exploits data on formal GATT/WTO trade disputes over the 1973–1998 period to address these questions empirically for the first time. We focus on trade disputes involving allegations either that the defendant country has provided an increase in protection to its import-competing sectors above the maximum level to which it agreed in an earlier negotiating round, or that it has refused to liberalize in a sector as previously agreed.¹ Our analysis looks to determine what economic and institutional factors influence the *economic* outcomes of these cases, that is, what features affect the ability of defendant governments to follow through with trade liberalization commitments.

Received for publication January 4, 2002. Revision accepted for publication May 13, 2003.

* Brandeis University.

I gratefully acknowledge financial support from a Mazer Award at Brandeis University. Thanks to Robert Staiger, Rachel McCulloch, Giovanni Maggi, Kyle Bagwell, Çağlar Ozden, and David Richardson for informative discussions, as well as seminar participants at the NBER Summer Institute, Brandeis, and the Midwest International Economics Group meetings and two anonymous referees for helpful comments on an earlier version. All remaining errors are my own.

¹ This approach requires, of course, that the allegations in the disputes have legal merit. Our data, together with compiled estimates from Hudec (1993) and other formal GATT/WTO panel reports, suggest that in only nine out of over one hundred cases in which a formal trade dispute panel report was circulated did a panel fail to find the defendant “guilty.” Of the remaining observations that did not result in a panel being established, compilations from Hudec (1993) and additional formal GATT/WTO correspondence provide evidence that in nearly one-half of those cases the defendant admitted to some level of culpability by removing or reforming the alleged GATT/WTO violation.

International trade theorists have identified at least two efficiency-enhancing roles for trade agreements. The first, highlighted by Staiger and Tabellini (1987) and Maggi and Rodríguez-Clare (1998), is to provide a commitment device for governments that are unable to commit credibly to liberalization with respect to behavior of domestic constituencies.² The second, highlighted by Bagwell and Staiger (1999), is to provide a commitment device for governments of large countries that are unilaterally unable to commit to the elimination of trade policies that result in a terms-of-trade-driven prisoner’s dilemma. The key implication of these theoretical papers is that unilateral policies that are set in the absence of a trade agreement are suboptimal, and that a government could better achieve its objectives with access to an external commitment device that would force it to follow through with a policy of liberal trade. One way to interpret the trade disputes in our data set is that they are examples of countries testing the role of the GATT/WTO commitment device, where defendant governments attempt to take advantage of whatever commitment power the GATT/WTO system can provide in order to liberalize trade and follow through with their obligations. The purpose of this paper is to empirically determine the origins of this commitment power.³

This paper is therefore a first attempt to identify empirically which potential *costs* imposed by the GATT/WTO trade dispute process allow defendant governments to overcome being unable to unilaterally commit to import liberalization. In the estimation, we attempt to separate out the cost of potential *retaliation* from what Kovenock and Thursby (1992) refer to as the cost of *international obligation*, or the stigma associated with failing to liberalize in the face of GATT/WTO procedures and evidence that the defendant is not complying with the rules or its obligations.⁴ After controlling for other factors in the estimation, we then

² Staiger and Tabellini (1987) suggest that trade agreements are useful in overcoming the time-inconsistency problem of free-trade policies that occurs when a government has an incentive to surprise its workers with protection, resulting in protection being anticipated and resources being allocated inefficiently in equilibrium. Furthermore, Maggi and Rodríguez-Clare (1998) find that trade agreements may be a valuable tool in foreclosing domestic political pressures when the foreclosure prevents a distortion in resource allocation for which the government would not be compensated.

³ We should clarify at this stage that this paper is not an attempt to differentiate between theories and decide empirically which is the main reason countries seek the commitment power provided by the GATT and WTO. Along these lines, Staiger and Tabellini (1999) empirically investigate the hypothesis that the GATT and WTO are providing commitment power that wouldn’t otherwise exist.

⁴ Kovenock and Thursby (1992, p. 160) borrow this concept from international law and motivate it in their theoretical model by suggesting that “[i]n the political economy interpretation of the model, we can think of this disutility [of international obligation] as a loss of goodwill in the international arena or the political embarrassment that comes from being suspected of violation”

interpret the economic success (that is, trade liberalization) that results from the dispute settlement process as being due to the commitment power the defendant country enjoys through participation in the GATT/WTO system.

A second motivation for this paper is to identify the fundamental determinants of economic success in formal trade disputes in the GATT/WTO system. Given the rate of growth in the number of formal disputes filed, the diversity of plaintiff countries initiating cases, and the number of cases resulting in adopted panel reports, the evidence certainly points to an increasingly efficient institutional structure and an increasingly *legalized* system.⁵ However, researchers have yet to determine whether the dispute settlement process is accomplishing the primary task of the GATT/WTO system, which is to liberalize trade. Here we do not assess whether the procedures are adequately performing this role, as any measure of success of the *system* must consider not only the effectiveness of dispute resolution in liberalizing trade in disputes that occur, but also the system's effectiveness in deterring countries from imposing policies that conflict with their GATT/WTO obligations.⁶ However, by illustrating that the pattern of economic success in these cases is influenced by incentives that the framers of the dispute settlement provisions may or may not have envisioned, we can perhaps identify reforms that might lead to a more economically successful dispute resolution framework.⁷

Our approach also complements and contributes to the existing empirical literature on trade disputes, which we characterize as falling into two categories. The first area also looks at the *outcomes* of trade disputes, but has focused almost exclusively on the United States's use of Section 301 of its trade law, where American exporters can petition the government to initiate a dispute against a foreign country. For example, Bayard and Elliott (1992, 1994) and Elliott and Richardson (1997) examine when the U.S. use of Section 301 resulted in market opening versus market closing. Kherallah and Bhegin (1998) also focus on U.S. trade

disputes and identify economic and political factors that increase the likelihood of the petition ending in a trade war as opposed to an agreement.⁸ In each of these papers, the outcome of the dispute was characterized as a categorical variable, interpreted by the researchers and from the perspective of the plaintiff country. Our approach differs in that we look at measures of resulting *trade liberalization* as our indicator of the dispute's economic resolution.⁹ Relative to papers that consider only cases in which the U.S. is a plaintiff, our approach is also much wider in scope in that we consider a set of trade disputes involving many developed and developing countries in the GATT/WTO system.

The second area of the empirical literature relates to the *initiation* of GATT/WTO trade disputes and includes investigations by Horn, Mavroidis, and Nordström (1999) and Bown (2004).¹⁰ Bown (2004) uses data on disputes and safeguard measures under the GATT regime to determine what factors influence a country's decision whether to provide import protection through the agreement's safeguard provisions rather than through a measure that leads to the initiation of a dispute. The results are consistent with those found here, in that concerns for retaliation appear to affect government trade policy decisions.¹¹ On the other hand, Horn et al. (1999) do not find evidence of a bias in the pattern of disputes that have been initiated under the WTO. They use a probabilistic model to illustrate that the pattern of disputes can be explained fairly well by the value of trade and the diversity of trading partners. They conclude that even though the United States, the European Union, Canada, and Japan initiate over 60% of all complaints, these two factors cause them to be involved in more formal trade disputes and therefore that measures of power do not affect dispute initiation. As we discuss below, these results contrast with our findings that power measures, including the threat of retaliation, matter when considering the economic outcome of disputes.

As a preview of our results, we find substantial evidence that the threat of retaliation is an important influence determining a defendant country's ability to credibly commit to

⁵ For a complete discussion of the legal and institutional aspects of the GATT/WTO dispute settlement system, including an analysis of the legal reforms implemented at the end of the Uruguay Round, see Petersmann (1997).

⁶ It is difficult to measure empirically the success of the provisions in dissuading behavior that would possibly lead to a trade dispute and potential retaliation, and thus we do not address that issue here. Bown (2002, 2004), however, provides a theoretical and an empirical approach, respectively, that address this issue.

⁷ It is also important to understand whether the dispute settlement provisions of the GATT and WTO are successful in inducing behavior consistent with GATT/WTO rules, given the recent theoretical literature focusing on the efficiency-enhancing properties of these rules. For example, Bagwell and Staiger (1999, 2001a, forthcoming) have illustrated how the rules of MFN and reciprocity induce countries to negotiate sustainable multilateral trade agreements, and such papers typically assume a functioning dispute resolution mechanism capable of enforcing these rules. To the extent that we can identify factors that affect the functioning of the dispute settlement mechanism, we may be able to improve our understanding of the scope of applicability of the results of this research area as well.

⁸ In the political science literature, Reinhardt (2001) does use data on GATT disputes and similarly derives an interpreted, ordinal measure of the extent to which a defendant "conceded" in a case. The question of interest in that study is what factors cause defendants to concede at different stages of the dispute settlement process. See also Busch and Reinhardt (2000), which further addresses WTO disputes.

⁹ Therefore, we concentrate on measures of economic success taken from the perspective of the dispute settlement system. That is, even though a defendant country may 'lose' a case and liberalize, the defendant government may see the dispute as a success in that the GATT/WTO has yielded the ability to commit to a more efficient policy than it was unable to commit to unilaterally.

¹⁰ Grinols and Perrelli (2002) also focus on the political and economic factors affecting the probability that a trade dispute will be initiated, but they consider only U.S. disputes.

¹¹ In other research assessing the role of retaliation in trade policy formulation, Gawande (1995) uses data on 1983 U.S. nontariff barriers that face its major trading partners and finds evidence of a substantial retaliatory component. See also the results and discussion of Gawande and Hansen (1999).

liberalization. Our results imply that, *ceteris paribus*, a plaintiff country that receives a 1 percentage point greater share of the defendant country's exports will receive a 2% to 3% increase in trade liberalization. We also find the somewhat surprising result that the threat of retaliation does not appear limited to the disputes in which the United States is the plaintiff country, as non-U.S. plaintiffs also obtain greater liberalization, the greater is their ability to threaten retaliation against the defendant should the defendant refuse to liberalize. On the other hand, we find only limited evidence that the costs imposed by international obligation are sufficiently large to give defendant countries commitment power. Thus even if the Uruguay Round reforms did create a more efficient legalized system, our results suggest that these reforms may have minimal *economic* impact on the resolution of disputes.

The rest of this paper proceeds as follows. Section II presents the basic theory of the tradeoffs facing a defendant country in a trade dispute and its liberalization decision, as well as a review of the GATT/WTO institutional background. Section III discusses the trade dispute data and our econometric framework. Section IV illustrates the empirical results, and Section V concludes with a discussion of additional caveats and areas for further research.

II. Theory and Institutional Background

In this section we briefly discuss the underlying theory and the institutional background of the GATT/WTO dispute settlement process that serves to motivate our empirical analysis.

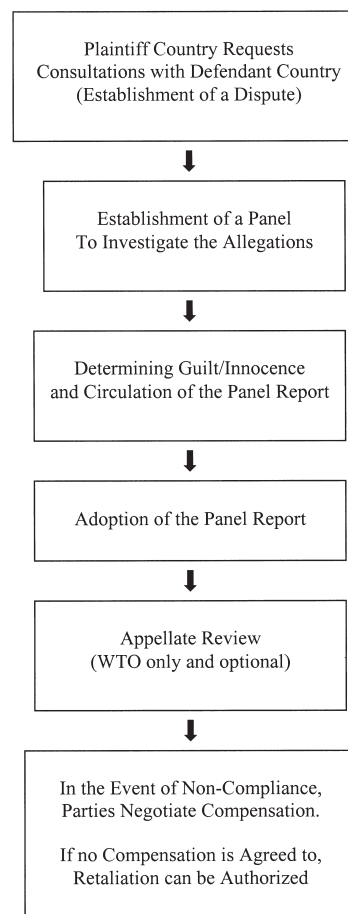
We start our analysis from the setting that countries have held a negotiating round and agreed to *bind* their tariffs, which refers to the GATT/WTO negotiating process by which governments agree to limit their applied tariffs to a rate at or below the negotiated level. The tariff bindings serve to establish conditions of expected market access facing exporters of trading partners.¹² From the GATT/WTO perspective, a deterioration in the conditions of market access, due to either the imposition of a nontariff measure or a tariff above the binding, violates that country's GATT/WTO obligations and would be grounds for a trade dispute.

Assume next that one government nevertheless implements a policy that results in such a deterioration of market access, thus leading to the initiation of a formal trade dispute by one of its trading partners.¹³ In keeping with the GATT/WTO institutional structure, we assume that if the defendant country loses the case and refuses to liberalize in

¹² For a discussion of the role of GATT and WTO in securing market access commitments, see Bagwell and Staiger (2001b).

¹³ A country might initiate such a unilateral policy in response to incentives generated from domestic interests [for example, those identified in Staiger and Tabellini (1987) or Maggi and Rodríguez-Clare (1998)] or in response to the large country's incentive to take advantage of its ability to affect the terms of trade (see, for example, Bagwell and Staiger, 1999).

FIGURE 1.—THE BASIC ELEMENTS OF THE GATT/WTO DISPUTE SETTLEMENT PROCESS



Source: Derived from Petersmann (1997, p. 184).

the disputed sector, it faces the costs imposed by the dispute settlement system. Figure 1 shows the important basic features of the dispute settlement process under the GATT and WTO.¹⁴ If the dispute settlement costs are large enough, they can offset the political and economic gains to implementing a unilateral policy that violates the terms of market access implied by the announced tariff binding. For sufficiently large costs, the defendant government will be able to commit credibly to trade liberalization, and the dispute settlement process will result in an *economic success*.¹⁵

The literature on dispute settlement suggests two important costs facing a defendant government which has violated

¹⁴ The differences between the GATT and WTO systems that are of importance to our empirical exercise are two. First, under the GATT regime, either country had the ability to veto the dispute process, at any step along the way. Second, under the WTO there is now a formal appellate procedure (and appellate body report) that the parties can resort to, and this was not available under the GATT regime.

¹⁵ In keeping with GATT/WTO practice, we assume there are no compensatory or punitive damages for past illegal behavior in the dispute settlement process. The defendant government only faces costs (to be spelled out below) in the dispute settlement process if it refuses to comply with its obligations and liberalize.

its GATT/WTO obligations.¹⁶ The first cost is any stigma attached to the failure to comply with GATT/WTO laws or rulings—what Kovenock and Thursby (1992) term the cost of *international obligation*. This cost may be realized through a weakening of the dispute settlement system; in future trade disputes where the current defendant is a plaintiff, the country may experience difficulty in obtaining economic success even though it too may legally win its case. Alternatively, the cost may manifest itself in future GATT/WTO negotiations; for example, in a future negotiating round the defendant's interests may not take priority on the agenda.

The second cost to a guilty defendant facing dispute settlement proceedings is the potential economic cost of retaliation by the plaintiff country that is authorizable by the GATT or WTO. As the defendant cannot be compelled to compensate the plaintiff, in order for the defendant to be forced to face the economic costs of dispute settlement, the plaintiff must have the capacity to retaliate. Bown (2002), for example, uses a simple bargaining framework of trade dispute negotiations to illustrate that when countries are large, a plaintiff's ability to affect the terms of trade will greatly influence its capacity to threaten retaliation. In that model, a tariff response by a large plaintiff country can both increase the plaintiff's welfare and decrease the defendant's welfare, thus having twice the effect on the critical benchmark, or *threat point*, that drives the outcome of the negotiations. A small plaintiff country's tariff that cannot affect the terms of trade will be less successful at improving the threat-point bargaining position, even if it is able to impose adjustment costs on the defendant, as it will not be able to improve its own benchmark welfare relative to free trade.

In order for the defendant government to credibly commit to liberalization, the dispute settlement costs must be large enough to offset the potential gains to the defendant government of offering protection. Therefore, when confronted with the trade dispute, the defendant government must weigh the tradeoffs—the potential costs of the failure to liberalize generated by the dispute settlement process—against the political and economic costs involved in liberalizing a potentially preferred sector. These costs are likely to differ across sectors and defendants, thus generating the variation in liberalizing activity necessary to allow us to estimate the effects of these costs on the economic success of the dispute settlement process.

III. Data and Estimation

B. Econometric Model and the Dependent Variable

For our empirical approach, we have constructed a data set of formal GATT and WTO trade disputes that were started and completed between 1973 and 1998 and that

¹⁶ The resource costs of litigation are less relevant, as the defendant could choose not to put up a fight.

involve allegations of excessive import protection. The trade dispute data are generated from a compilation by Hudec (1993), from WTO (1995, 1997), and from various panel reports.¹⁷ With regard to the basic data, each dispute involves a single plaintiff¹⁸ and defendant government as well as a disputed sector. For each dispute let t be the year of the dispute's initiation. Then we assume that successful economic resolution of the dispute is influenced by the following estimation equation:

$$IMP_LIB = \alpha + \beta R_{d,p} + \gamma I + \delta M + \psi D + \epsilon, \quad (1)$$

where the dependent variable, $IMP_LIB \equiv \ln(IMP_{d,p,T+3}^i) - \ln(IMP_{d,p,t-1}^i)$, is the log growth rate of the defendant (d) country imports from the plaintiff (p) country in the disputed sector i between the year before the start of the dispute ($t - 1$) and three years after the end of the dispute ($T + 3$).¹⁹ We define the end year (T) of the dispute to be: (i) the year the appellate body report was adopted, if the panel report was appealed, or (ii) the year the panel report was adopted, if it was adopted and not appealed, or (iii) otherwise the latest year that there was a formal correspondence between one of the parties and the GATT or WTO regarding the dispute. To construct the import data, we rely on GATT and WTO panel reports which identify the Harmonized System (HS) tariff lines of the products under dispute. We then use the six-digit HS import data available from UNCTAD (1995, 2002) to generate our measure of import liberalization.²⁰

With regard to our dependent variable, we note that the GATT or WTO does not formally assess a defendant's conformity with its obligations by looking at trade flows. Instead, panels are concerned with the disputed sector's conditions of competition, or *market access*. Better measures of economic success would thus include detailed information on the change in the tariff or nontariff measure under dispute. Unfortunately, these data are both difficult to measure (for the case of nontariff barriers) and unavailable for the countries and years necessary for our analysis. We

¹⁷ We also use portions of the data set compiled by Reinhardt (2001) to establish termination dates for a handful of the GATT-era cases not found in Hudec (1993).

¹⁸ A few disputes have multiple plaintiffs filing jointly, but we separate these into individual disputes, in view of our interest in and focus on bilateral negotiations. We discuss the implication of focusing on bilateral measures of trade liberalization and the associated caveats in section V.

¹⁹ Article 21.5 of the WTO's Dispute Settlement Understanding gives a defendant country up to 18 months to make policies consistent with panel rulings. Therefore, depending on when in the calendar year a ruling was adopted, the impact on trade of a policy reform may not be fully felt until the third year after the last correspondence between parties and the GATT or WTO. Nevertheless, we illustrate below that our results are robust to reasonable changes in the time frame under consideration.

²⁰ For disputes prior to 1991, the six-digit HS data are not available, and thus we use the four-digit SITC import data of Feenstra, Lipsey, and Bowen (1997) and Feenstra (2000). For cases that do not explicitly state which HS or SITC products are under dispute, we rely on a description of the product at issue and the concordance files of Feenstra (2000) and UNCTAD (1995, 2002) to match the product description with the appropriate industry or tariff line number.

thus proxy with data on bilateral trade, under the assumption that increased trade is highly correlated with more competitive market conditions and greater market access. Furthermore, from the perspective of the dispute settlement system, the best measure of success of the dispute resolution process may also take into account the potential outcome that concessions between the plaintiff and defendant might be balanced through either retaliation or alternative liberalization being granted by the defendant. Finding systematic data on this is also difficult and beyond the scope of the current analysis.

Of the explanatory variables in equation (1), the matrix $R_{d,p}$ captures the plaintiff country's capacity to retaliate against the defendant, and thus measures one potential cost to the defendant of the failure to liberalize. The other potential cost of failing to liberalize, the cost of international obligation, is captured in the matrix I . Next, M is a matrix of macroeconomic and trade-related control variables, and D is a matrix of dummy variables including sets of time, country, sector, and allegation dummies that will also be used as controls and discussed in more detail below. Finally, α , β , γ , δ , and ψ are the vectors of parameters to be estimated, and ϵ is the additive error term. In the next section we discuss the construction of these explanatory variables.

B. The Explanatory Variables and Data Construction

Retaliation and the Costs of the Failure to Liberalize: First consider the retaliation costs facing a defendant that fails to liberalize. Referring again to equation (1), in the matrix $R_{d,p}$ we include variables such as EXP_SHARE , which is the share of the defendant's total exports sent to the plaintiff in T and is the primary measure of the plaintiff country's capacity to retaliate, as this captures its ability to impose economic costs on the defendant. In some specifications we also include $REAL_EXP$, which is the real dollar value of defendant exports to the plaintiff in year T . In both cases the export data are taken from Feenstra et al. (1997) and Feenstra (2000). Theory predicts that with regard to the costs imposed by retaliation, these variables should have a positive influence on liberalization: the more reliant is the defendant on the plaintiff's market for its own exports, the more import liberalization it would be expected to undertake in the disputed sector.

Institutional Features, International Obligation, and the Costs of the Failure to Liberalize: Consider next the costs of failing to liberalize that are generated by international obligation. The matrix I includes the variable $PANEL_GUILT$, which is an indicator that a panel made a negative ruling in the dispute that the defendant had imposed a policy that was inconsistent with either GATT/WTO rules or its own obligations. The theory highlighting the role of international obligation suggests that this would have a positive impact on dispute resolution: failing to comply with a

negative GATT/WTO ruling would impose political costs on the defendant government. Therefore, a guilty determination should give the government more credibility and result in more liberalization than the defendant would find possible without the ruling. We interact this variable with another indicator, $SMALL_PLAINTIFF$, which takes on a value of 1 if the plaintiff in the dispute was a country other than the United States, the European Union, Japan, or Canada. This investigates the hypothesis that international obligation is particularly costly to defendants in cases where the plaintiff country is not one of these four traditional GATT/WTO litigants. Data on the legal outcomes of the cases were compiled by the author from Hudec (1993) and individual panel reports.

Furthermore, for WTO cases we also include an indicator for whether the panel decision was appealed ($APPEALED = 1$). Panel resolutions that are appealed may signal particularly sensitive disputes in which liberalization may be unlikely even with a negative ruling by a panel. Finally, note that we drop from the estimation nine observations in which a GATT or WTO panel determined the defendant to be innocent, as we are interested in focusing on disputes where defendant liberalization is expected.²¹

Other Controls Affecting Disputed Sector Import Growth: In our estimation of equation (1) we must also control for the fact that imports in the disputed sector may be increasing due to factors aside from any explicit liberalization decisions made by the defendant government. For example, imports tend to rise with income growth. Therefore, in the matrix M we include $GDP_GROWTH \equiv \ln(RGDP_{d,T+3}) - \ln(RGDP_{d,t-1})$, which measures the defendant country's real income growth ($RGDP_d$) over the same time period as the dependent variable. The GDP data are taken from World Bank (2001).

Next, we also include in M a measure of the defendant's growth in imports from the plaintiff (between $t - 1$ and $T + 3$) in the other sectors ($-i$) that are not being disputed. Define this variable as $IMP_LIB_AOG \equiv \ln(IMP_{d,p,T+3}^{-i}) - \ln(IMP_{d,p,t-1}^{-i})$. This variable controls for the trade of certain plaintiff and defendant pairs becoming more integrated (for example the United States and Canada in their free-trade area starting in the late 1980s), which naturally would lead to an increase in trade between the pair that is unrelated to the results of dispute settlement negotiations. Therefore, we would also expect this variable to be positively correlated with disputed sector import growth. For 1991–1998 cases, the “all other good” import data are six-digit HS data taken from UNCTAD (1995, 2002), and for 1973–1990 cases, the import data are four-digit SITC data taken from Feenstra et al. (1997) and Feenstra (2000).

²¹ We have considered specifications where we keep these observations and include an indicator controlling for the innocent outcome, and this had little effect on the results.

TABLE 1.—A BREAKDOWN OF THE DATA IN THE SAMPLE: 174 OBSERVATIONS

Sectors		Defendant Countries (20)		Plaintiff Countries (36)	
Animal products	18	E.U. ^a	58	U.S.	40
Vegetables and fruits	46	U.S.	50	E.U. ^a	28
Animal or vegetable fats and oils	1	Japan	21	Canada	22
Prepared foodstuffs	37	Canada	10	India	9
Minerals	3	Argentina	5	Brazil	7
Chemicals	8	Korea	5	Chile	7
Leather	5	Australia	4	Argentina	6
Wood	4	Brazil	2	Australia	6
Pulp and paper	2	Norway	3	Japan	4
Textiles and clothing	7	Czech/Slovak	3	Mexico	4
Footwear	5	Chile	3	Colombia	3
Base metals	3	Finland	2	Thailand	3
Machines and electronic equipment	8	Spain	1	Hong Kong	3
Vehicles	4	Sweden	1	Guatemala	2
Fish and marine products	13	Mexico	1	New Zealand	3
Other	10	Peru	1	Korea	2
		Venezuela	1	Finland	2
		New Zealand	1	Philippines	2
		India	1	Peru	2
		Malaysia	1	Costa Rica	2
				Venezuela	2
				Portugal	1
				Sweden	1
				Nicaragua	1
				Switzerland	1
				Singapore	1
				Pakistan	1
				Indonesia	1
				Malaysia	1
				Sri Lanka	1
				Panama	1
				Dominican Rep.	1
				Cuba	1
				Norway	1
				Uruguay	1
				Zimbabwe	1
GATT/WTO Period					
Tokyo Round	13				
1980–1985	38				
Uruguay Round	70				
WTO	53				
Measures		Institutional Aspects			
Quantitative restrictions and licensing	54	Panel established	96		
Tariff measures	14	Panel adopted	71		
Antidumping measures	15	Panel not adopted	25		
Countervailing duties	18	Appealed	18		
Safeguard measures	8				
Domestic subsidies	13	Panel guilty	73		
Domestic standards	18	Admission guilty	37		
Rules of origin or tariff schedule misclassification	7	Other/unknown	64		
Discriminatory internal tax regimes	10	(Panel innocence	9)		
Government procurement	3				
Other	14				

^a Includes any dispute involving any member of the European Union or European Economic Community at the time the agreement was formally constituted and the GATT/WTO trade dispute was initiated.

The estimation must also take account of the plaintiff's supply-side considerations, that is, that a particular plaintiff's disputed sector exports to the defendant may be changing because of country-specific supply shocks experienced over the period of the dispute's resolution. We control for this by defining $EXP_GROWTH \equiv \ln(IMP^i_{-d,p,T+3}) - \ln(IMP^i_{-d,p,t-1})$, which measures the plaintiff's export growth of the disputed product i to all other (nondefendant) markets between $t - 1$ and $T + 3$. We would also expect this relationship to be positive, and here the export data are derived from UNCTAD (1995, 2002), Feenstra et al. (1997), and Feenstra (2000) as well.

Consider finally the matrix D , which includes additional controls. First, in different specifications we control for the nature of the allegation in the dispute through the *MEASURE* categories (tariff versus nontariff measures, antidumping measures versus subsidies versus domestic standards, and so on), defined in table 1. These eleven different categories for alleged GATT/WTO violations may differ in (i) the ease of reform required for the defendant to make itself GATT/WTO-compliant, (ii) the domestic political economy considerations that led to the GATT/WTO-inconsistent policies to be initiated, and (iii) the impact on

imports and thus on potential import liberalization. Data for categorizing the dispute into a *MEASURE* category was compiled by the author from Hudec (1993) and WTO (2001). For disputes in which more than one measure was under dispute, we categorize the case according to a judgment as to which disputed measure appeared to be most important. The categories for the trade barrier measures are, with slight modification, the categories found in Jackson (2000, Table B-9).

In the matrix D we also control for the *SECTOR* under dispute. We include the sixteen different industry categories listed in table 1, and this allows us to control for any sector-specific political economy considerations that may affect the trade liberalization resulting from dispute settlement negotiations. The categories for the sectors are also a slightly modified version of the categories described in Jackson (2000, table B-8). In different specifications we also include *DEFENDANT* country fixed effects, in order to control for country differences in responsiveness to domestic political economy interests and/or their international obligations. Finally, we also consider indicators for the period in which the dispute was initiated over the 1973–1998 sample. For example, due to the increased

TABLE 2.—SUMMARY STATISTICS FOR THE ESTIMATION VARIABLES: 174 OBSERVATIONS

Variable	Predicted Sign	Mean Value	Standard Deviation	Minimum	Maximum
Dependent Variable					
<i>IMP_LIB</i>		0.0078	1.8335	-8.1852	6.5793
Explanatory Variables					
<i>EXP_SHARE</i>	Positive	0.1232	0.1739	0	0.8195
<i>REAL_EXP</i> ^a	Positive	0.0322	0.0435	0	0.1795
<i>PANEL_GUILT</i> × <i>SMALL_PLAINTIFF</i>	Positive	0.1897	0.3932	0	1
<i>APPEALED</i>	Negative	0.1034	0.3054	0	1
<i>WTO</i>	Positive	0.3046	0.4616	0	1
<i>NTM</i>	Negative	0.9195	0.2728	0	1
<i>GDP_GROWTH</i>	Positive	0.1554	0.0880	-0.1022	0.5012
<i>IMP_LIB_AOG</i>	Positive	0.3033	0.4188	-0.8730	1.4932
<i>EXP_GROWTH</i>	Positive	0.2277	1.0121	-4.8374	7.5465

^a Scaled so that 0.032 is equivalent to \$32 billion (\$1992).

legalization of the dispute settlement process, we might expect disputes that were begun under the WTO to result in more liberalization than those begun under the GATT regime. Another claim is that many trade disputes are initiated during an ongoing negotiating round, not because the plaintiff is interested in following through with the case and obtaining liberalization through that forum, but instead as a political maneuver to force the defendant country to allow the sector to be given priority in the round's negotiating agenda. One purpose of the United States initiating a variety of disputes with the European Union over Airbus in the late 1980s was arguably to highlight the issue of aircraft subsidies on the Uruguay Round agenda.

Notably absent from the analysis are industry-level political and economic variables that are typically used, as in Gawande (1995) or Hansen and Prusa (1997), in studies of country-specific trade policies. Examples of such variables include changes in industry employment, domestic shipments, capacity utilization rates, or concentration ratios and political contributions.²² Unfortunately, the industry-level time series of data necessary for our analysis is not readily available and would require a substantial commitment to data collection that is beyond the scope of the current project. Thus we attempt to take account of these political-economic features with our *SECTOR*, *DEFENDANT*, and *MEASURE* controls, with the associated caveat that this is a limitation of the current study.

This data collection approach leaves us with 174 trade dispute observations for which we have sufficient data for the $t - 1$ to $T + 3$ period. Tables 1 and 2 illustrate the summary statistics and other features of the data used in the estimation.

C. Additional Estimation Issues

We conclude this section with a brief discussion of potential omissions from our data set and the associated

²² For a review of the empirical political economy literature on U.S. trade policy, see Gawande and Krishna (forthcoming). For political economy features of the empirical literature for the particular case of antidumping policy, see Blonigen and Prusa (forthcoming).

implications for the estimation. Although we are essentially looking at the relevant population of dispute settlement activity under the GATT and WTO, this is admittedly only a sample of GATT/WTO-inconsistent policies that governments undertake. There are surely other examples of GATT/WTO-inconsistent policies that have not been submitted to the dispute settlement provisions and thus aren't part of our data set. Horn et al. (1999) have provided evidence that there does not appear to be a bias in trade dispute initiation under the WTO; nevertheless, here we discuss briefly the characteristics of potential unreported activity and comment on whether its omission is likely to introduce bias into the estimation and thus affect the interpretation of our results.

First consider the typical characteristics of GATT/WTO-inconsistent activity that would take place without being reported. A potential plaintiff (that is, a country facing a deterioration of market access conditions of a trading partner, relative to what it expected) would not initiate a dispute even in the face of a GATT/WTO-inconsistent policy if the expected gain from dispute initiation were smaller than the cost. This is more likely if (i) the gains to the plaintiff from the defendant actually removing the GATT/WTO-inconsistent policy are small, (ii) the probability of the defendant actually removing the GATT/WTO-inconsistent policy is small, and (iii) the costs to the plaintiff of pursuing a case are large.²³ We consider the implication of each issue in turn.

First, assume that our data set systematically omits GATT/WTO-inconsistent activity that, if removed, would lead to only small welfare gains for the plaintiff, which is likely if the value of trade at stake in the potential dispute is very small. It is unlikely that omitting such GATT/WTO-inconsistent activity would bias our results, given that we are estimating the effects of various determinants on the

²³ Furthermore, there may also be a free-rider problem that would discourage plaintiffs from pursuing disputes when there are multiple affected exporting countries. Free riding may lead to an overrepresentation of disputes initiated in response to import-restricting policies that affect a concentrated group of exporters (antidumping or countervailing duties, other violations of MFN, and the like).

TABLE 3.—REGRESSION RESULTS: BASIC MODEL SELECTION

Independent Variable	Baseline Specification (1)	Add DEFENDANT Dummies (2)	Add MEASURE Dummies (3)	Add SECTOR Dummies (4)
<i>EXP_SHARE</i>	1.616*** (0.615)	2.992*** (1.024)	2.305** (0.783)	2.607*** (0.573)
<i>PANEL_GUILT</i> × <i>SMALL_PLAINTIFF</i>	0.797* (0.460)	0.939* (0.544)	0.440 (0.387)	0.466 (0.358)
<i>APPEALED</i>	-0.557 (0.384)	-0.756* (0.434)	-0.637 (0.358)	-0.674 (0.396)
<i>WTO</i>	0.285 (0.302)	0.586* (0.307)	0.507 (0.333)	0.439 (0.373)
<i>NTM</i>	-0.601* (0.326)	-0.575 (0.420)	—	—
<i>GDP_GROWTH</i>	6.676*** (2.094)	4.680*** (2.368)	5.148** (1.827)	5.370** (2.235)
<i>IMP_LIB_AOG</i>	-0.387 (0.423)	-0.276 (0.494)	-0.237 (0.516)	-0.217 (0.561)
<i>EXP_GROWTH</i>	0.262* (0.135)	0.296* (0.163)	0.195 (0.141)	0.167 (0.170)
<i>CONSTANT</i>	-0.799* (0.410)	-0.699 (0.492)	-0.611** (0.277)	-1.193 (1.067)
<i>DEFENDANT</i>	No	Yes	Yes	Yes
<i>MEASURE</i>	No	No	Yes	Yes
<i>SECTOR</i>	No	No	No	Yes
Observations	174	174	174	174
<i>R</i> ²	0.16	0.27	0.34	0.38
Akaike information criterion	3.971	4.109	4.114	4.240

NOTES: Dependent variable is *IMP_LIB*. Standard errors are in parentheses. Standard errors are White's heteroskedasticity-consistent in specifications (1) and (2) and further corrected for clustering on the *MEASURE* variable in specifications (3) and (4). Finally, ***, **, and * denote parameter estimates statistically different from zero at the 1, 5, and 10 percent levels, respectively.

growth rate of imports in equation (1) and not on their levels.

Next assume that our set of trade disputes omits GATT/WTO-inconsistent activity that faces a low probability of removal. The theory suggests that a potential defendant will be less likely to abandon a policy (and therefore it will fail to liberalize imports) when the costs of the dispute settlement process are not high enough to induce it to comply with its obligations. If our sample of data systematically omits observations that are less likely to result in liberalization because the retaliatory or international obligation costs facing the defendant are too low, this will lead our results us to *underestimate* the impact of these variables overall.

Finally, consider omissions of GATT/WTO-inconsistent activity due to high costs to the plaintiff pursuing the case. First note that the pecuniary costs facing a plaintiff for merely initiating a dispute are not large. However, the political costs for doing so may be large and particularly important for poor plaintiffs facing potential defendants on whom they may be reliant for bilateral aid, military assistance, and so on. Furthermore, the pecuniary costs of following through with the litigation are substantial and may be prohibitive for certain poor plaintiff countries, suggesting endogeneity between *SMALL_PLAINTIFF* and *PANEL_GUILT*. Nevertheless, because equation (1) is not affected by income levels, it is unclear that such a data omission would otherwise influence the interpretation of our results.

IV. Empirical Results

A. Initial Estimation Results and Basic Model Selection

Given our empirical approach, table 3 provides our first set of results of estimating equation (1). Column (1) presents the initial and simplest specification. The reported parameter estimates of the key explanatory variables are generally of the sign the theory predicts. For example, the parameter estimate on the plaintiff's capacity to retaliate, as measured through *EXP_SHARE*, is positive and statistically significant. Defendants thus tend to liberalize more in cases where they are more reliant on the plaintiff as a destination for their own exports.

Furthermore, for plaintiffs other than the United States, the European Union, Japan, or Canada, the impact of a negative GATT or WTO panel ruling against the defendant (*PANEL_GUILT* = 1) is positive and statistically significant at the 10% level. Specification (1) also documents that *APPEALED* cases end in less liberalization, whereas cases taking place under the WTO receive more liberalization, *ceteris paribus*, though the estimates for the effects of these variables are not statistically significant at the 10% level.²⁴ Disputes concerning allegations over nontariff measures also tend to result in less liberalization, as we would expect.

²⁴ Specifications including other indicators for disputes initiated during the Tokyo or the Uruguay Round of negotiations resulted in insignificant parameter estimates and are thus omitted here.

Our control for the effect of the defendant's national income growth is also positive and significant, as is the control for the plaintiff's supply-side growth through its exports of the disputed product to all other (nondefendant) countries. Finally, the effect of growth in the defendant's imports from the plaintiff in all other (nondisputed) sectors, is not statistically different from 0.

In specifications (2), (3), and (4) of table 3 we sequentially add controls for *DEFENDANT* countries involved in the dispute, the alleged *MEASURE* in violation of GATT/WTO rules in the dispute, and the *SECTOR* of the disputed product, respectively. Adding *DEFENDANT* country controls in specification (2) results in a substantially larger effect of the retaliation (*EXP_SHARE*) variable as well as improved statistical significance of the *APPEALED* and *WTO* variables and an estimate for the *NTM* dummy that is no longer statistically different from 0. This last result on the *NTM* variable may be due to substantial heterogeneity in the types of nontariff measures at issue in these disputes. Thus, in specification (3) we drop the simple *NTM* dummy and add separate indicators for each of the categories of alleged barriers through the *MEASURE* variable categories listed in table 1. Furthermore, to address the concern about heteroskedasticity across different types of trade barriers, we calculate standard errors based on the clustering of observations around the *MEASURE* categories. The result of specification (3) is that the signs of the parameter estimates on the explanatory variables are unchanged, and those estimates that had a marginal statistical significance in specification (2) are no longer significant. This result also holds when we include industry fixed effects through the *SECTOR* indicators added in specification (4).

To summarize the results of table 3, though we have found some evidence that both the concern for tariff retaliation and international obligation (when facing a small plaintiff) affect the defendant's disputed sector import liberalization, only the measure of retaliatory capacity is robust to slight changes in model specification. Finally, as the R^2 measure rises with each set of added controls, in each specification we also report Akaike's information criterion as a measure of model fit to inform the model selection choice. Given these statistics, we will rely on variants of model (4) for the remainder of the specifications under consideration.

B. The Importance of Retaliation Threats

In this subsection we investigate the importance of the plaintiff's capacity for retaliation, the one potential defendant cost of failing to liberalize that is statistically significant across specifications in table 3. First, though the effect of *EXP_SHARE* is statistically significant, is it economically important? The results of specifications (2) through (4) imply that each percentage point increase in *EXP_SHARE* leads to a 2.3% to 3.0% increase in the growth rate in the value of disputed sector imports from the plaintiff.

In table 4 we further check the sensitivity of the retaliation result to alternative measures and specifications. In specification (5) we include an additional variable to investigate whether the concern for retaliation through *EXP_SHARE* is driven entirely by the cases in which the United States is the plaintiff, as the United States has historically been the GATT and WTO participant most vocal in articulating (and carrying out) its retaliatory threats. Nevertheless, when we include a variable interacting *EXP_SHARE* with an indicator for disputes not involving the United States as a plaintiff, though the estimate is negative, it is not statistically significant. This implies that *EXP_SHARE* is important for both U.S.- and non-U.S.-plaintiff cases.²⁵

A second question is whether retaliatory threats have a greater or lesser effect under the WTO than in disputes that took place during the GATT regime. A priori, an argument can be made that the effect could go either way: Retaliatory threats could play a greater role under the WTO in view of the elimination of the unilateral veto power under the GATT that made it possible for a defendant to forbid GATT-sanctioned retaliation. On the other hand, with the legalization of the dispute settlement system under the WTO, legal scholars have argued that power would be expected to play a less prominent role in the new regime. The estimate presented in specification (6) is consistent with this ambiguity—the capacity to retaliate through *EXP_SHARE* does not have a statistically significant difference in its effect on *IMP_LIB* under the WTO from what it had under the GATT.

In model (7) we verify the robustness of our retaliation measure itself by substituting export *levels* (*REAL_EXP*) for export *shares*. The pattern of qualitative results is unchanged, but the statistical significance falls. However, this is likely due to the fact that the variable is defined with no implicit normalization: that a certain dollar value of trade may be large for one defendant country and small for another, given the difference in defendant countries' sizes in the sample.

C. Further Robustness Checks

In the last three columns of table 4 we consider final sensitivity checks to our results. Specification (8) of table 4 takes our baseline specification (4) of table 3 and redefines all of the growth variables to be over the $t - 1$ to $T + 2$ period, instead of $T + 3$. The qualitative pattern of results is largely unchanged, except that the parameter estimate on *EXP_SHARE* is slightly larger and the estimate for *GDP_GROWTH* is no longer statistically significant.

In specification (9), we again use the $t - 1$ to $T + 3$ period, but instead of conventional log growth rate measures, we use Davis and Haltiwanger's (1992) approach to measuring growth rates. This allows us to utilize the

²⁵ For the U.S.-plaintiff cases, this is consistent with Elliott and Richardson's (1997) results on Section 301 disputes.

TABLE 4.—REGRESSION RESULTS: INVESTIGATING MEASURES OF THE CAPACITY FOR RETALIATION

Independent Variable	U.S. vs. non-U.S. Plaintiffs (5)	GATT vs. WTO (6)	<i>REAL_EXP</i> instead of <i>EXP_SHARE</i> (7)	<i>T</i> + 2 instead of <i>T</i> + 3 (8)	Alternative Growth Rate Measure (9)	Probit Model ^a (10)
<i>EXP_SHARE</i>	2.664*** (0.573)	2.814*** (0.550)	—	3.453*** (0.985)	1.092** (0.476)	3.291*** (0.688)
<i>EXP_SHARE</i> × <i>NON-US_PLAINTIFF</i>	-0.348 (1.687)	—	—	—	—	—
<i>EXP_SHARE</i> × <i>WTO</i>	—	-1.263 (1.967)	—	—	—	—
<i>REAL_EXP</i>	—	—	5.320* (2.820)	—	—	—
<i>PANEL_GUILT</i> × <i>SMALL_PLAINTIFF</i>	0.459 (0.359)	0.473 (0.357)	0.371 (0.440)	0.697 (0.437)	0.263 (0.226)	0.551* (0.322)
<i>APPEALED</i>	-0.682 (0.405)	-0.607 (0.440)	-0.630 (0.460)	-1.042 (0.656)	-0.289 (0.422)	-0.130 (0.630)
<i>WTO</i>	0.433 (0.369)	0.554 (0.430)	0.287 (0.406)	0.405 (0.329)	0.228 (0.336)	0.308 (0.484)
<i>GDP_GROWTH</i>	5.431** (2.182)	5.194** (2.271)	5.782** (2.279)	2.922 (3.231)	2.372** (1.021)	2.949** (1.245)
<i>IMP_LIB_AOG</i>	-0.223 (0.554)	-0.199 (0.570)	-0.286 (0.591)	-0.598 (0.571)	0.072 (0.180)	0.263 (0.271)
<i>EXP_GROWTH</i>	0.167 (0.170)	0.162 (0.170)	0.179 (0.164)	0.036 (0.106)	0.123 (0.155)	0.077 (0.108)
<i>CONSTANT</i>	-1.202 (1.048)	-1.104 (1.156)	-1.153 (1.141)	0.404 (0.554)	-0.351 (0.586)	-2.265*** (0.673)
<i>DEFENDANT</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>MEASURE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>SECTOR</i>	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174	174	174	180	183	181
<i>R</i> ²	0.38	0.38	0.37	0.37	0.30	—
Akaike information criterion	4.251	4.249	4.264	4.267	3.104	1.488

NOTES: Dependent variable is *IMP_LIB*. In parentheses are White's heteroskedasticity-consistent standard errors corrected for clusters defined on the *MEASURE* variable. ***, **, and * denote variables statistically different from zero at the 1%, 5%, and 10% levels, respectively.

^a Dependent variable is equal to 1 if *IMP_LIB* > 0.

observations that had zero trade in either $t - 1$ or $T + 3$ and that were thus dropped from the earlier sample of observations. We therefore redefine the import growth rate of the dependent variable as

$$IMP_LIB \equiv \frac{IMP_{d,p,T+3}^i - IMP_{d,p,t-1}^i}{\frac{1}{2}(IMP_{d,p,t-1}^i + IMP_{d,p,T+3}^i)}, \quad (2)$$

where $IMP_{d,p,t-1}^i$ is again the real dollar value of the defendant's disputed sector i imports from the plaintiff in time $t - 1$. This measure of import growth is symmetric around 0, and it lies in the closed interval $[-2,2]$ with trade flows that end (start) at 0 corresponding to the left (right) endpoint.²⁶ We use analogous equations to define *GDP_GROWTH*, *IMP_LIB_AOG*, and *EXP_GROWTH* for specification (9), and we are then able to use nine additional trade dispute observations in the estimation. The result is that the sign and statistical significance of the parameter estimates is unchanged. The size of the estimate on *EXP_SHARE* is smaller in specification (9), but this is due to the fact that the growth rate measure of the dependent variable

²⁶ Furthermore, Davis and Haltiwanger note that this measure of the growth rate is monotonically related to the conventional growth rate measure, with the two measures being approximately equal for small rates of growth.

is now forced to lie in the interval $[-2,2]$, whereas this was not the case when we used the log growth rate measure.

Finally, in specification (10) we use a probit model and estimate the effect of the explanatory variables on the *likelihood* that there will be any liberalization in the disputed sector at all. Therefore, we define the dependent variable as taking on a value of 1 if *IMP_LIB* > 0. The result for *EXP_SHARE* is consistent with the other specifications. Furthermore, the cost of international obligation (measured through the interaction of *PANEL_GUILT* and *SMALL_PLAINTIFF*) is also important in this specification regarding the likelihood of liberalization, as its parameter estimate is positive and statistically significant at the 10% level.

D. What Effect do Different GATT/WTO-Inconsistent Measures Have on Liberalization?

Do different trade barriers have differential effects on the trade liberalization resulting from dispute settlement negotiations? Each of specifications (3) through (10) in tables 3 and 4 included fixed effects for the each different GATT/WTO-inconsistent *MEASURE* that the defendant country allegedly used to restrict imports. Table 5 presents an expansion of the results of specifications (3) and (4) and

TABLE 5.—EXPANDED REGRESSION RESULTS FROM TABLE 3: THE INFLUENCE ON LIBERALIZATION OF DIFFERENT NONTARIFF MEASURES

<i>MEASURE</i> Category	With <i>DEFENDANT</i> and <i>MEASURE</i> Dummies Only (3)	With <i>DEFENDANT</i> , <i>MEASURE</i> , and <i>SECTOR</i> Dummies (4)
Quantitative restrictions and licensing	−0.087 (0.201)	−0.256 (0.213)
Domestic standards	−0.101 (0.312)	−0.179 (0.331)
Discriminatory internal tax regimes	−0.476 (0.268)	−0.038 (0.405)
Antidumping measures	−0.618* (0.283)	−0.519 (0.296)
Countervailing duties	−0.520 (0.299)	−0.797* (0.407)
Safeguard measures	−0.693* (0.320)	−1.002*** (0.307)
Domestic subsidies	−1.896*** (0.135)	−1.764*** (0.562)
Rules of origin and tariff schedule misclassification	−0.478** (0.193)	−0.593** (0.231)
Government procurement	0.886*** (0.272)	1.192* (0.555)
Other NTM	0.376 (0.360)	−0.057 (0.394)

NOTES: Omitted category is a dispute over a tariff measure. The standard errors in parentheses are White's heteroskedasticity-consistent ones, corrected for clustering on the *MEASURE* variable, and ***, **, and * denote parameter estimates statistically different from 0 at the 1%, 5%, and 10% levels, respectively.

reports the estimated effects of these different trade barriers.²⁷

The omitted category in table 5, and thus the benchmark, involves disputes alleging GATT/WTO-inconsistent *tariff* measures. Not surprisingly, the first row of estimates indicates that there is no differential effect between tariff barriers and disputes on quantitative restrictions or licenses, which are “border” measures that would also be relatively easy to bring into GATT/WTO compliance. We also find that disputes involving tariff measures result in similar rates of trade liberalization to those involving domestic standards or problems relating to a country's internal tax regime, *ceteris paribus*. On the other hand, disputes involving defendants that have used GATT/WTO-inconsistent antidumping measures, countervailing duties, safeguards, subsidies, and rules of origin or tariff schedule misclassifications all conclude in less liberalization than disputes over tariffs, *ceteris paribus*. This result is also not surprising, given that it may be necessary in these disputes for the defendant government to reform domestic statutes or bureaucratic procedures in order to make itself consistent with a panel ruling and/or its GATT/WTO obligations. Finally, disputes involving issues of government procurement tend to result in more liberalization than tariff cases, though we interpret this result with some caution, as there were only three procurement cases in the data set.

E. The Costs of International Obligation and Final Caveats

In specifications (1) and (2) of table 3 and specification (10) of table 4 we presented some statistical evidence that

²⁷ Specifications (5) through (9) resulted in qualitatively similar estimates for the different categories in *MEASURE*; thus to conserve space we do not report them here. They are available by request from the author.

cases which involved small plaintiffs and guilty panel rulings had a positive impact on the defendant's disputed sector import liberalization. However, this evidence supporting the importance of the costs of international obligation was not robust to alternative specifications.

In unreported results, we have considered alternative specifications investigating whether other features of the dispute resolution process (see again figure 1 and table 1) affect the liberalization of disputed sector imports. We investigated whether disputes which were settled before the panel stage might result in more liberalization, perhaps because they involved complaints that were politically easier to resolve. We also investigated whether the panel process might play a different role in the WTO, given the Uruguay Round reforms which eliminated the veto power that defendant countries had at their disposal under the GATT and which resulted in a more efficient panel process. However, none of these alternative specifications led to estimates for the appropriately defined variables that were statistically different from 0.

Finally, we have also not reported parameter estimates on the different *SECTOR* variables included in specifications (4) through (9), because the estimated effect of most variables is not statistically different from 0. Exceptions are the chemicals and footwear sectors, where there is consistently less liberalization than in the benchmark animal products category. Furthermore, we also note that the explanatory values of the models as measured through the R^2 statistic are low. We speculate that this may largely be due to a data concern that we identified earlier: our inadequate measures for the domestic political economy considerations that also likely affect the defendant's trade liberalization decision.

V. Conclusion

This paper provides a first attempt at empirically identifying the features of the dispute settlement process that give governments the ability to commit to trade liberalization. We use data on formal GATT/WTO trade disputes between 1973 and 1998 and conclude that it is the potential costs of retaliation that allow governments to commit. With respect to evidence from trade disputes, a government's ability to commit appears to be derived from the power of the defendant's (plaintiff) trading partner. Thus, whereas Horn et al. (1999) conclude that the *initiation* of disputes may not be influenced by power measures, our results suggest that the successful economic *resolution* of disputes is influenced by the concern for retaliation. The results have economic significance, and they are present in both U.S.-plaintiff and non-U.S.-plaintiff cases and in disputes initiated under both the GATT and the WTO. On the other hand, we find only limited evidence that the cost of international obligation, or the stigma associated with failing to comply with a negative GATT/WTO panel ruling, is sufficiently large to influence a defendant's liberalization decision.

For a government that seeks to use the GATT and WTO as a commitment device but who is unable to do so given that the trading partner from whom it derives the disputed sector imports is bilaterally weak, one potential remedy has been identified by Maggi (1999). He suggests that an additional feature of the GATT/WTO *multilateral* institution is the ability to coordinate power-sharing in the presence of bilateral imbalances of power. This role may thus be underexploited in the current state of the GATT and WTO, given our evidence that reliance on the *GATT/WTO system* itself is insufficient to fully induce trade liberalization. Furthermore, as we suggested in the introduction, our results also have implications for the scope of applicability of theoretical research that assumes a functioning dispute settlement system that enforces that GATT and WTO's efficiency-enhancing rules. This question should be further investigated empirically.

The results presented in this paper are also subject to some additional caveats. In particular, our measure of the economic success of dispute resolution has focused exclusively on measures of bilateral trade liberalization. We have not addressed the potential trade diversion that may be occurring, if there is no *net* liberalization and what is happening in the economically "successful" disputes is that the plaintiff is simply reallocating imports toward powerful defendant trading partners and away from other exporting third countries. Bagwell and Staiger (forthcoming) have identified an efficiency-enhancing feature of the GATT/WTO rules that in theory attempts to prevent such potential *bilateral opportunism* from occurring. The empirical question is an open area for future research.

Finally, though we have been able to provide evidence as to what it is about the GATT/WTO system that gives a defendant government the power to commit to liberalization

in a disputed sector, we have not addressed the question of why disputes are initiated. Though theorists have provided a variety of motives for governments to turn to the GATT and WTO for commitment power, there is no empirical work that can speak to which of these theories is the most important for understanding why governments turn to the GATT and WTO in reality. We have been unable to address the question why governments face trade disputes that test this commitment power, and furthermore, why the particular set of GATT/WTO-inconsistent policies in our data set has found its way into formal trade dispute activity while other dubious policies have not. These are difficult and yet important areas that should also be subject to further inquiry.

Nevertheless, our results do have a direct implication for questions concerning the evolution of dispute settlement in the GATT/WTO system and its role as a dispute settlement model for other areas of international concern. The evidence suggests that when it comes to the economic success of dispute settlement, it is economic incentives that matter. Reforms that target legal or institutional efficiency and not economic incentives may therefore have a small economic impact. This is not to say that the reforms of the Uruguay Round that improved the efficiency of the dispute settlement process were counterproductive; it is simply that they may not be sufficient to achieve economic success.

REFERENCES

- Bagwell, Kyle, and Robert W. Staiger, "An Economic Theory of GATT," *American Economic Review* 89:1 (1999), 215–248.
- "Domestic Policies, National Sovereignty, and International Economic Institutions," *Quarterly Journal of Economics* 116:2 (2001a), 519–562.
- "The WTO as a Mechanism for Securing Market Access Property Rights: Implications for Global Labor and Environmental Issues," *Journal of Economic Perspectives* 15:3 (2001b), 69–88.
- "Multilateral Trade Negotiations, Bilateral Opportunism and the Rules of GATT/WTO," *Journal of International Economics* (forthcoming).
- Bayard, Thomas, and Kimberly Elliott, "'Aggressive Unilateralism' and Section 301: Market Opening or Market Closing?" *The World Economy* (November 1992), 685–706.
- *Reciprocity and Retaliation in U.S. Trade Policy* (Washington, DC: Institute for International Economics, 1994).
- Blonigen, Bruce A., and Thomas J. Prusa, "Antidumping," in James Harrigan (Ed.), *Handbook of International Trade* (Basil Blackwell, forthcoming).
- Bown, Chad P., "The Economics of Trade Disputes, the GATT's Article XXIII, and the WTO's Dispute Settlement Understanding," *Economics and Politics* 14:3 (2002), 283–323.
- "Trade Disputes and the Implementation of Protection under the GATT: An Empirical Assessment," *Journal of International Economics* 62:2 (2004), 263–294.
- Busch, Marc L., and Eric Reinhardt, "Bargaining in the Shadow of the Law: Early Settlement in GATT/WTO Disputes," *Fordham International Law Journal* 24 (2000), 158–172.
- Davis, Steven J., and John Haltiwanger, "Gross Job Creation, Gross Job Destruction, and Employment Reallocation," *Quarterly Journal of Economics* 107 (1992), 819–863.
- Elliott, Kimberly, and J. David Richardson, "Determinants and Effectiveness of 'Aggressively Unilateral' U.S. Trade Actions," in Robert C. Feenstra (Ed.), *The Effects of U.S. Trade Protection and Promotion Policies* (Chicago: University of Chicago Press, 1997).
- Feenstra, Robert, "World Trade Flows, 1980–1997, with Production and Tariff Data," University of California, Davis, mimeograph and accompanying CD-ROM (2000).

- Feenstra, Robert, Robert Lipsey, and Harry Bowen, "World Trade Flows, 1970–1992, with Production and Tariff Data," NBER working paper no. 5910 and accompanying CD-ROM (1997).
- Gawande, Kishore, "Are U.S. Nontariff Barriers Retaliatory? An Application of Extreme Bounds Analysis in the Tobit Model," *this REVIEW*, 77:4 (1995), 677–688.
- Gawande, Kishore, and Wendy L. Hansen, "Retaliation, Bargaining, and the Pursuit of 'Free and Fair' Trade," *International Organization* 53 (1999), 117–159.
- Gawande, Kishore, and Pravin Krishna, "Political Economy of U.S. Trade Policy: The Empirical Evidence," in James Harrigan (Ed.), *Handbook of International Trade*, Basil Blackwell (forthcoming).
- Grinols, Earl L., and Roberto Perrelli, "Politics, the WTO, and Trade Disputes: Evidence from U.S. Cases," *Pacific Economic Review* 7:2 (2002), 335–357.
- Hansen, Wendy, and Thomas J. Prusa, "The Economics and Politics of Trade Policy: An Empirical Analysis of ITC Decision Making," *Review of International Economics* 5 (1997), 230–245.
- Horn, Henrik, Petros C. Mavroidis, and Håkan Nordström, "Is the Use of the WTO Dispute Settlement System Biased?" CEPR discussion paper no. 2340 (1999).
- Hudec, Robert, *Enforcing International Trade Law: The Evolution of the Modern GATT Legal System* (Salem, NH: Butterworth Legal Publishers, 1993).
- Jackson, John H., "The Role and Effectiveness of the WTO Dispute Settlement Mechanism," in Susan M. Collins and Dani Rodrik (Eds.), *Brookings Trade Forum, 2000* (Washington, DC: The Brookings Institution, 2000).
- Kherallah, Mylene, and John Beghin, "US Trade Threats: Rhetoric or War?" *American Journal of Agricultural Economics* 80 (1998), 15–29.
- Kovenock, Daniel, and Marie Thursby, "GATT, Dispute Settlement, and Cooperation," *Economics and Politics* 4 (1992), 151–170.
- Maggi, Giovanni, "The Role of Multilateral Institutions in International Trade Cooperation," *American Economic Review* 89 (1999), 190–214.
- Maggi, Giovanni, and Andrés Rodríguez-Clare, "The Value of Trade Agreements in the Presence of Political Pressures," *Journal of Political Economy* 106:3 (1998), 574–601.
- Petersmann, Ernst-Ulrich, *The GATT/WTO Dispute Settlement System: International Law, International Organizations and Dispute Settlement* (London: Kluwer Law International, 1997).
- Reinhardt, Eric, "Adjudicating without Enforcement in GATT Disputes," *Journal of Conflict Resolution* 45:2 (2001), 174–195.
- Staiger, Robert, and Guido Tabellini, "Discretionary Trade Policy and Excessive Protection," *American Economic Review* 77 (1987), 823–837.
- , "Do GATT Rules Help Governments Make Domestic Commitments?" *Economics and Politics* 11:2 (1999), 109–144.
- UNCTAD, *Trade Analysis and Information System (TRAINS), Version 3.0* (Geneva: UNCTAD, 1995).
- , *Trade Analysis and Information System (TRAINS), Version 9.0* (Geneva: UNCTAD, 2002).
- World Bank, "Global Development Network Growth Database" on-line data set available at <http://www.worldbank.org/research/growth/GDNdata.htm> (access date November 10, 2001).
- WTO, *Analytical Index: Guide to GATT Law and Practice, volume 2* (Geneva: WTO, 1995).
- , "Panel Reports under the MTN Agreements and Arrangements (Tokyo Round Codes) of 1979," unpublished WTO document (1997).
- , "Update of WTO Dispute Settlement Cases," WTO on-line document at http://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm (access date October 18, 2001).