Trade policy under the GATT/WTO: empirical evidence of the equal treatment rule

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Abstract. A fundamental difference between multilateral trade agreements like the GATT and WTO and a preferential agreement is the multilateral agreements' inclusion of a most-favoured-nation principle. Though MFN requires that members implement policies that provide equal treatment to all GATT/WTO countries, how far do members actually follow the MFN principle when so required? We empirically investigate a sample of GATT/WTO trade disputes and the effect of successful dispute settlement negotiations on the disputed product trade of third country exporters to the defendant country. We document evidence of trade liberalization consistent with defendant countries successfully applying the equal treatment rule. JEL classification F13

Politique commerciale sous le régime GATT/OMC : résultats empiriques de la règle du traitement équivalent. Une différence fondamentale entre les accords commerciaux multilatéraux comme le GATT ou l'OMC et un accord préférentiel est que dans le premier cas on fait appel au principe de la nation la plus favorisée. Même si ce principe requiert que les membres mettent en place des politiques qui assurent un traitement équivalent à tous les pays de l'accord GATT/OMC, reste à savoir jusqu'à quel point les membres se soumettent à ce principe quand c'est requis. Ce mémoire étudie la question en faisant enquête sur un échantillon de disputes commerciales autour d'accords de type GATT/OMC, et sur l'effet du succès des négociations dans la résolution de conflit sur le commerce du produit au cœur de la dispute en provenance de pays tiers exportant vers le pays qui se défend. On montre que les résultats de la libéralisation du commerce sont consistants avec l'application de la règle du traitement équivalent par les pays qui se défendent.

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1. Introduction

A fundamental pillar of the multilateral, GATT/WTO system is the most-favoured-nation (MFN) clause, designed to promote non-discrimination in trade policy in the form of the equal treatment of trading partners.[1] The existence of this pillar in such arrangements is perhaps the key distinction between multilateral and preferential trade agreements (PTAs), which, by their very nature, allow countries to discriminate by offering better terms of market access (usually free trade) to the members of the PTA, than are offered to non-members. Theoretical research assessing the impact of including an MFN clause in trade agreements is an emerging area, and recent papers exploring this role include Bagwell and Staiger (2004) and Ethier (2004).[2] For example, one concern facing countries that participate in multilateral agreements such as the GATT/WTO is what Bagwell and Staiger (2004) define as the problem of 'bilateral opportunism,' since subsets of countries have an incentive to renegotiate aspects of the agreement over time in order to enhance their own well-being at the expense of third countries excluded from the bilateral renegotiations. They argue that the MFN principle is an important rule that helps the GATT/WTO prevent such bilateral opportunism from occurring.[3]

There are many examples of countries taking advantage of *exceptions* to the MFN rule and applying GATT/WTO-consistent *differential* treatment to trading partners – whether it be through the formation of PTAs, affording 'special and differential treatment' to developing countries through the generalized system of preferences (GSP), or applying country-specific antidumping measures. As we review in more detail below, the empirical trade policy literature has investigated various examples of permissible differential treatment. The question that has not yet been addressed in the MFN discussion is whether there is *evidence* that countries in the GATT/WTO system actually implement non-discriminatory policies, or provide equal treatment to trading partners, when the rules require that they do so.

In this paper we investigate the equal treatment question by focusing on one GATT/WTO setting where a trade liberalizing country is supposed to follow

1 A second principle of non-discrimination under the GATT/WTO is the national treatment rule embodied in Article III. This other non-discrimination principle, which relates to the unequal treatment of domestic and foreign produced goods, will not be a topic of investigation here. We use the terms 'MFN,' 'equal treatment,' and 'non-discrimination' interchangeably throughout this paper.

2 Horn and Mavroidis (2001) provide a comprehensive survey of the fundamental economic and legal issues in the theoretical literature on the MFN rule. Other important papers in the literature on the role and impact of including an MFN clause in trade agreements include Saggi (forthcoming), McCalman (2002), Ludema (1991), Cebin and Ludema (2001), and Caplin and Krishna (1988).

3 Ethier (2004) finds that MFN allows countries to insure against a similar phenomenon termed 'concession diversion.'

the MFN principle. We then assess whether trade liberalization gains granted by one country under bilateral negotiations are accompanied by the equal treatment of its other trading partners. The particular setting is the bilateral (plaintiff/defendant) GATT/WTO dispute settlement negotiations over allegations that a defendant country has violated its GATT/WTO obligations by offering excessive protection to an import-competing sector. We focus on formal disputes that result in sectoral trade liberalization's being afforded by the defendant to a plaintiff country, and we empirically assess the impact of those bilateral liberalization gains on the trade of third countries that also export the disputed product to the defendant.

To clarify some of the issues involved in our analysis, consider a specific example. In January 1997 the EU filed a formal WTO complaint accusing Japan of restricting imports of European pork. Shortly thereafter, Canada filed with the WTO a formal request to intervene in the Japanese/EU bilateral dispute settlement consultations as an interested third party.[4] At the time of the dispute, Japan was the world's largest importer of pork (Agriculture and Agri-Food Canada 1997), and Canadian and EU pork exporters supplied roughly 11% and 14% of the Japanese import market, respectively. One explanation for Canada's request to participate in the consultations was its concern that Japan would ultimately discriminate against Canadian exporters in favour of EU exporters when allocating its final import market access commitments. Canada may have had an incentive to intervene in this particular case for additional reasons. First, both Japan and the EU had already been formally accused of previously engaging in bilaterally opportunistic behaviour. Bagwell and Staiger (2004) identify as examples, (i) a U.S. complaint that the EU had negotiated preferential tariffs on citrus imports from certain Mediterranean countries, and (ii) an EU complaint filed against Japan concerning preferential access given to the United States in the Japanese market for semi-conductor products. Furthermore, in 1997, 15% of total Japanese exports went to the EU, whereas less than 2% of total Japanese exports went to Canada. From a retaliation-threat viewpoint, Japan thus had more to fear from the EU than from Canada, perhaps giving Japan an additional incentive to restructure its pork market-access commitments in favour of EU exporters. In considering all of these aspects, Canada took advantage of its WTO rights to legally protect its market-access commitments by thus intervening in the negotiations as an interested third party.

In this paper we focus on the impact that GATT/WTO *bilateral* negotiations have on the exports to a defendant's disputed sector from *third* countries. In the context of the example presented above, our fundamental question is: What impact do the *bilateral* Japanese/EU trade dispute negotiations over European pork exports to Japan have on the pork exports to Japan from a

4 See trade dispute documents WT/DS66/1 and WT/DS66/3 available at the WTO's website, http://www.wto.org.

third country like Canada? Specifically, we focus on a sample of 1991–98 GATT/WTO dispute settlement negotiations, including a subset of cases that we define as being 'economically successful' at the bilateral level, that is, that resulted in trade liberalization between the defendant and plaintiff countries. We examine whether these successes are accompanied by the equal treatment of all exports of the disputed product to the defendant.

This research builds on our prior empirical work assessing the impact of GATT/WTO rules and the determinants of *economic* success of dispute resolution.[5] In Bown (2004a), we used data on bilateral GATT/WTO trade dispute negotiations and found substantial evidence to support the theory that 'power' measures, such as the credible threat of retaliation by the plaintiff, allow defendant governments to live up to their trade liberalization commitments. On the other hand, the investigation found only limited evidence that particular procedural or institutional features of the GATT/WTO dispute settlement process have contributed to the successful *economic* resolution of trade disputes. Here, we extend the analysis to take the perspective of 'third' (non-plaintiff, non-defendant) countries that have an obvious interest in the dispute settlement process through their desire to export to the defendant's disputed sector.[6] One key result of Bown (2004a) was to document empirically the importance of the GATT/WTO *reciprocity* principle: if the plaintiff in the dispute has made valuable market access commitments to the defendant that it can threaten to withdraw as retaliation, the defendant is better able to follow through with the (reciprocal) liberalization. Here we investigate the effectiveness of another GATT/WTO rule, the MFN principle.

In addition to an investigation into the effectiveness of GATT/WTO rules, this paper is also a contribution to the broader literature assessing the place of discriminatory trade policy in trade agreements. The closest related empirical work is research that considers a noted exception to the MFN rule, such as a PTA or the use of country-specific antidumping measures, and assesses the impact of the MFN-exception on trade flows, that is, the prevalence of Viner's (1950) 'trade diversion.'[7] The work of Clausing (2001) is one recent example;

5 Related research in the political science literature includes papers by Busch and Reinhardt (2000) and Reinhardt (2001), which use data on GATT and WTO disputes and derive an interpreted, ordinal measure of the extent to which a defendant 'conceded' in a case. The question of primary interest in those studies is what factors cause defendants to concede at different stages of the dispute settlement process. In addition to not considering the issue of MFN, their approach also differs in that the outcome of the dispute was characterized as a categorical variable, interpreted by the researchers and from the perspective of the plaintiff country. The approach of Bown (2004a) and here is different in that we look at measures of resulting *trade liberalization* as our indicator of the dispute's economic resolution.

6 Note that in Bown (2004a) and here, we do not claim to measure the overall performance of the dispute settlement system. Any such assessment must also take into consideration the system's performance at *discouraging* the type of activity that violated GATT/WTO rules in the first place.

7 For example, an empirical analysis of preferential trade agreements typically assesses the impact of discriminatory trade policies on trade flows comparing the amount of 'trade creation' with the amount of 'trade diversion.' See Clausing (2001) for a review of this literature.

she addresses the Canadian and U.S. experience in the Canada-U.S. Free Trade Agreement (CUSFTA), finding substantial evidence of trade creation and little evidence of trade diversion. In another paper related in spirit to our analysis Prusa (2001) investigates the presence of trade diversion in the context of U.S. antidumping (AD) cases. He illustrates that *decreased* trade from 'named' countries in an AD investigation is accompanied by *increased* trade – or trade diversion – from (third) countries that were 'not-named' in the U.S. AD petition. While both the Clausing and the Prusa papers are empirical assessments of the presence of trade diversion, these papers cannot address the question of whether countries implement policies on an MFN basis when it is expected of them, given that the CUSFTA and the U.S. imposition of AD duties are both GATT/WTO-permitted exceptions to the MFN rule through the GATT's Articles XXIV and VI, respectively.

In our setting of GATT/WTO dispute settlement negotiations, we distinguish between disputes in which bilateral (plaintiff/defendant) liberalization and the application of the MFN rule would expectedly lead to the multilateralization of trade gains versus disputes in which trade from third country exporters might be expected to actually fall. For example, if the defendant's *initial* GATT/WTO violation were a discriminatory policy, then its initial negative effect on the plaintiff implied a relatively positive effect on the other (third) exporting countries that supplied the defendant's disputed market. In such disputes, any bilateral liberalization afforded to the plaintiff would not need to be extended to third countries, and, in fact, the *equal treatment* of all trading partners would expectedly lead to defendant disputed sector imports from third country exporters (that are no longer being treated preferentially, relative to the plaintiff) to fall.

As a preview of our results, we find evidence from trade data to support the claim that the successful bilateral economic resolution to a trade dispute between a plaintiff and a defendant country is accompanied by the equal treatment of third countries that also export the disputed product to the defendant. Controlling for other factors, we estimate that, at the conclusion of a trade dispute where the multilateralization of bilateral gains to third countries might be most expected a priori, third countries on average *increase* exports by 0.76% to 0.99% for a 1% increase in exports gained by the plaintiff. We also provide evidence of the equal treatment rule working in the other direction in disputes in which the defendant's act of initial protectionism discriminated against the plaintiff, relative to third country exporters. In some cases in which the plaintiff is able to increase its disputed sector exports to the defendant, we estimate that third countries *decrease* their exports to the defendant on average by 1.69% to 2.47% for a 1% increase in exports gained by the plaintiff, as the third countries' original (implicit) preferential treatment is removed. Finally, we also find evidence that retaliation threats and the concern for a future trade dispute brought by the third country also matter in achieving such liberalization, which is consistent with the results of related research.

The rest of this paper proceeds as follows. In section 2 we discuss the basic theory and in section 3 present the econometric model and a discussion of data. In section 4 we describe our estimation results, and section 5 concludes.

2. Theory and institutional background

In this section we introduce the underlying theory and the institutional background of the GATT/WTO system that serves to motivate our empirical analysis. Before turning to the fundamental questions of interest regarding MFN and *third* country exports, we discuss the theory used to derive the related framework of Bown (2004a), which establishes determinants of the bilateral liberalization negotiations between the *plaintiff* and defendant governments.

2.1. The defendant's bilateral liberalization decision

Consider a scenario where a country has violated its GATT/WTO obligations by offering more protection to a domestic, import-competing sector than it had agreed it would limit itself to in a prior negotiating round. As a result of this protection, the country finds itself in the role of a defendant in a formal GATT/WTO trade dispute facing the question of whether it will liberalize and implement its previously negotiated import market access commitments.

The literature on dispute settlement in international trade policy suggests that there are at least two important costs facing a defendant government that has violated its GATT/WTO obligations and offered excessive protection to an import-competing sector.[8] The first such cost is the stigma of failing to comply with GATT/WTO laws and to abide by GATT/WTO rulings, an idea introduced into the economics literature by Kovenock and Thursby (1992) and termed the cost of 'international obligation.'[9] The refusal of the defendant to liberalize after the determination of guilt by a panel may thus be politically costly. The second cost to a guilty defendant facing dispute settlement proceedings would be the potential *economic* cost of retaliation by the plaintiff country that is authorizable by the GATT/WTO, and if the defendant is to be forced to face the economic costs of dispute settlement, the plaintiff must have

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

9 Kovenock and Thursby (1992, 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.' 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 has legally 'won' its case.

the capacity to retaliate.[10] In order for the defendant government to credibly commit to liberalization, the combination of these costs imposable by the dispute settlement system must be larger than the political and economic gains to the defendant government of continuing to protect its private sector.

Bown (2004a) documents evidence on these costs impacting the defendant's liberalization decision with respect to the plaintiff. First, it appears that only in recent years (i.e., under the WTO) and only in cases initiated by countries other than the four primary GATT/WTO litigants (United States, EU, Canada, or Japan) has there been a positive and significant impact of a 'guilty' panel ruling on the trade liberalization received by the plaintiff country, thus implying a limited effectiveness of the cost of 'international obligation.' There is strong evidence, however, that the potential *economic* cost of a plaintiff's retaliation assists the defendant government in committing to bilateral trade liberalization with respect to imports from the plaintiff. The empirical results highlighting the threat of *retaliation* indicate that when a government needs a trade agreement to commit to reform, such an agreement may be most effective if it is with respect to imports from *large* countries who have the capacity to retaliate and impose substantial costs on the government, should it deviate from the reform. Thus the results also demonstrate the importance of the GATT/WTO *reciprocity* principle identified in the theoretical work by Bagwell and Staiger (1999): if the plaintiff has made valuable market access commitments to the defendant that it can threaten to withdraw by retaliating, the defendant will be better able to fulfil its reciprocal trade liberalization commitments. We return to a discussion of this evidence in section 4.1 below.

2.2. The defendant's multilateralization decision

The focus of the current paper is to assess empirically the effectiveness of another fundamental principle of the GATT/WTO system – the MFN principle, or the policy of not discriminating between trading partners. Economists have long argued that multilateral trade agreements that incorporate an MFN rule can allow countries to avoid the potential trade diversion losses initially identified by Viner (1950) that are associated with bilateral, preferential, or otherwise discriminatory trading arrangements. One practical difficulty with multilateral agreements, however, is that pairs of countries have a strong incentive to renegotiate the agreement's terms and form bilateral sub-agreements wherein the welfare of each bilateral participant improves at the expense of a third country that has been excluded from the negotiations. Nevertheless, Bagwell and Staiger (2004) have illustrated how, in theory, the GATT/WTO rules of reciprocity, MFN, and the potential for third countries to file future

10 Bown (2002) provides a simple theory using a Nash 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.

'non-violation' complaints under the dispute settlement provisions effectively aid countries in avoiding bilateral opportunism or other forms of systematic discrimination against third countries.[11]

How effective are the rules of the GATT/WTO system at overcoming the practical problem of countries providing unequal treatment to trading partners when they are not authorized to do so? In order to better frame this issue within the context under investigation here, we consider the following question: How effective is the MFN clause at multilateralizing successes in bilateral trade liberalization negotiations (where appropriate) and otherwise allowing for the equal treatment of trading partners? Here, we thus extend the analysis of the determinants of bilateral (plaintiff/defendant) trade liberalization negotiations to assess the impact of bilateral liberalization gains on the trade to the defendant by 'third' (non-plaintiff) country exporters of the disputed product.

What trade-offs does a defendant face when deciding whether to extend liberalization gains to 'third' countries? As was the case with respect to the question of whether trade from the plaintiff would be liberalized, the defendant may be more likely to liberalize with respect to a given third country if it faces the threat of substantial costs for failing to live up to its GATT/WTO obligations were it to do so. One example is if the third country were a 'substantial supplier' to the defendant of the product of interest in the original dispute. Given that it was a substantial supplier and that the plaintiff of the original dispute had been afforded additional market access that was both at the expense of the third country's exporters and inconsistent with its GATT/WTO obligations, the third country would have the right to file a future trade dispute against the defendant claiming that its market-access rights have been violated. The costs of a future third country dispute facing the defendant include the potential economic cost of retaliation as well as concern for the political stigma of failing to abide by GATT/WTO rules (this time, the MFN principle), which can again be motivated by Kovenock and Thursby's (1992) cost of 'international obligation.' Thus, the defendant may also find it costly to fail to extend liberalization gains to a third country that has followed GATT/WTO procedure by formally intervening and identifying itself as interested in the bilateral defendant/plaintiff dispute settlement negotiations.

3. Econometric model and data

The equal treatment question of interest is the impact of the *bilateral* (plaintiff/defendant) trade liberalization on the trade in the disputed sector between

11 'Non-violation' complaints are disputes in which a trading partner claims that, though the defendant may not have broken any GATT/WTO rules, it failed to yield the market access commitments that the plaintiff had a legitimate expectation of receiving. For a legal discussion, see Petersmann (1997, chap. 4).

the defendant and 'third' countries. Because some determinants of the growth of plaintiff/defendant trade may affect third country/defendant trade, we require a two-stage econometric framework. In the following section we introduce the basic data of the underlying trade dispute, as well as the equations to be estimated and the formal econometric procedure, before turning to a discussion of variable construction. We then conclude this section with a discussion of sample selection bias and techniques used to address this concern.

3.1. The estimation equations of interest

For our empirical approach, we have constructed a set of data on formal GATT and WTO trade disputes that were started and completed between 1991 and 1998 and involve legitimate allegations of excessive import protection over a well-defined set of products.[12] The trade dispute data are generated from a compilation of Hudec (1993), WTO (1995, 1997), and various formal GATT/WTO panel reports, which gives us the plaintiff and defendant countries, the products and time line of the case, as well as any third countries that formally intervene and identify themselves to the GATT/WTO as being interested in the proceedings. Given our primary interest in the impact on 'third' countries, we combine all disputes that involve the same defendant and disputed product into a single dispute. Therefore, we do not have any observations in which a country is a 'third' country in one observation and a 'plaintiff' country in a related (same product, same defendant) dispute in another observation. In disputes that have multiple plaintiffs, these cases are therefore aggregated, so that we can focus on the third party repercussions of a bilateral dispute between a defendant and an 'aggregate' plaintiff.

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, 2001) to generate our measures of import liberalization of the disputed product.[13] We use the defendant's import data to identify all of the 'third' countries that also export the disputed product to the defendant in the time period in question. Thus, the identities of the third countries of primary interest in the estimation are revealed by the trade data and are therefore *not* limited solely to those countries that formally intervene by identifying themselves as interested third parties to the GATT or WTO. Table 1 provides a summary of the country participation in our sample of trade dispute data under investigation.

12 The legitimacy of the allegations is determined as much as possible by referring to the GATT/WTO panel reports and other documentation, as well as the information provided in Hudec (1993). We therefore omit from the data the few disputes in which a GATT/WTO panel determined the defendant to be 'innocent.'

13 For cases that do not explicitly state which HS products are under dispute, we rely on a description of the product at issue and the concordance files of UNCTAD (1995, 2001) to match the product description with the appropriate tariff line number.

TABLE 1
Country representation as GATT/WTO defendants, plaintiffs and third countries in the sample of 1991–98 trade disputes

Country	Number of country observations in the data set		
	As defendant country (18 different countries)	As plaintiff country (26 different countries)	As third country (108 different countries)
US	21	9	25
EU*	19	13	23
Argentina	5	4	27
Japan	4	2	37
Canada	2	10	36
Brazil	2	4	36
Czech/Slovak Republics	2	0	17
Australia	2	0	41
Chile	1	4	26
Mexico	1	3	33
Venezuela	1	2	23
Guatemala	1	2	17
Korea	1	1	39
Norway	1	1	34
Malaysia	1	1	28
Peru	1	0	15
Turkey	1	0	21
Poland	1	0	36
India	0	6	29
Thailand	0	3	38
Colombia	0	2	24
Other country observations	0	12	1178
Total	67	79	1783

We use a modified version of Bown (2004a) to model the successful economic resolution[14] to each bilateral (plaintiff/defendant) dispute as

14 Note that in a trade dispute, the GATT/WTO does not formally assess a defendant's conformity with its GATT/WTO obligations by looking at trade volumes, but instead the panels are concerned with the conditions of competition, or *market access*, in the sector under dispute. For a discussion of the role of GATT/WTO in securing market access commitments, see Bagwell and Staiger (2001). A better measure of 'economic success' would include detailed information on the change in the tariff or non-tariff barrier under dispute. Unfortunately, these data are not available for the countries and years necessary for our analysis; thus, we proxy for this with data on bilateral trade volumes, under the assumption that increased trade is highly correlated with more competitive market conditions and greater market access. This same point applies to the dependent variable in equation (2) below. 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 concessions being granted by the defendant.

$$IMP\_LIB^{i}_{d,p} = \alpha_0 + \alpha_1 R_{d,p} + \alpha_2 I_1 + \alpha_3 M_{d,p} + \alpha_4 D_1 + \epsilon_{d,p}, \qquad (1)$$

where the dependent variable, $IMP\_LIB^{i}_{d,p}$, is the 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 ($T+3$).[15] 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/WTO regarding the dispute.[16] As we discuss in more detail below, equation (1) serves as the first-stage equation of a two-stage estimation procedure assessing the impact of the MFN principle.

With respect to the explanatory variables in equation (1), the $R_{d,p}$ matrix 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, or the cost of 'international obligation,' is captured in the I_1 matrix. $M_{d,p}$ is a matrix of macroeconomic and trade-related control variables, and D_1 is a matrix of dummy variables including indicators for whether the defendant's GATT/WTO-inconsistent policy was a tariff or non-tariff measure. Finally, the αs are the vectors of parameters to be estimated, and $\epsilon_{d,p}$ is the additive error term.

Next we turn to consideration of the MFN question of interest – how are defendant imports from a third country affected by the bilateral plaintiff/defendant negotiations? Again, note that a third country is revealed by the data as another source of the defendant country's imports of the six-digit HS product under dispute. The second stage estimation equation used to address the equal treatment question is then the following:

$$IMP\_LIB^{i}_{d,h} = \beta_0 + \beta_1(V \; x \; IMP\_LIB^{i}_{d,p}) + \beta_2 R_{d,h} + \beta_3 I_2 + \beta_4 M_{d,h} + \beta_5 D_2 + \epsilon_{d,h}, \qquad (2)$$

where in equation (2), the dependent variable, $IMP\_LIB^{i}_{d,h}$, is the growth of the defendant (d) country imports from a 'third' (h) country in the disputed sector i between $t-1$ and $T+3$. The explanatory variable of primary interest to the MFN question is $IMP\_LIB^{i}_{d,p}$, or the impact that growth in the defendant's

15 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/WTO. Nevertheless, we investigate the robustness of our results to reasonable changes in the time frame under consideration.

16 We also drop WTO disputes that were appealed but that went to arbitration in 1999, given that our series of trade data ends in 2001.

disputed sector *i* imports from the *plaintiff* have on defendant imports from the *third country*, which we interact with an indicator of the defendant's initial *violation* from the vector V.

In terms of the other explanatory variables in equation (2), the $R_{d,h}$ matrix captures one potential cost to the defendant of discriminating against the third country, through the third country's capacity to retaliate in a future dispute. The I_2 matrix again attempts to capture the potential cost of 'international obligation,' suggesting that third countries that formally intervene as interested parties in the dispute settlement process may enjoy additional liberalization from the defendant, relative to other third countries that do not intervene. $M_{d,h}$ is a matrix of macroeconomic and trade-related control variables; D_2 is a matrix of sector, country, and allegation control variables; the βs are the vectors of parameters to be estimated; and $\epsilon_{d,h}$ is the additive error term.

3.1.1. Predictions for the equal treatment variables

We first note that our approach can at most provide *indirect* evidence on whether different exporting countries are being treated equally, as the MFN principle so requires. The MFN clause captured in the GATT's Article I is a legal principle applying to tariff rates and conditions of market access, and there is nothing in the GATT/WTO formally linking the MFN rule to equal changes in the volume of trade. Nevertheless, because we cannot observe or track all policies that allow for exporters to be treated differently, we focus on changes in the pattern of trade and interpret these changes as proxying for the effects of these unobservable policies. After controlling for other factors that affect changes in trade patterns, we investigate whether the relationship between plaintiff and third country exports to the defendant are consistent with an effective equal treatment rule.

Furthermore, as we have suggested earlier, finding an estimate for the impact of $IMP\_LIB^{i}_{d,p}$ in equation (2) and interpreting the effectiveness of the equal treatment rule is also complicated by the fact that the size and sign of the estimated coefficient for β_1 depends on the defendant country's initial *violation* that is at the heart of the dispute. Therefore, in equation (2), we interact $IMP\_LIB^{i}_{d,p}$ with a vector of indicators V, which are categories for the defendant's initial *violation*.

To see how an effective equal treatment rule would lead to opposing predictions for the sign of β_1 depending on the defendant's initial *violation*, consider two potential examples for elements of V in our data. First suppose that the defendant's initial violation restricted imports only from the plaintiff through a discriminatory policy. A concrete example would be that the defendant initially imposed a country-specific antidumping measure that restricted imports of *i* only from the eventual plaintiff. Suppose the defendant imposed this measure without showing that its domestic producers of *i* were injured, thus violating GATT/WTO rules. In this case, a successful resolution to the

bilateral dispute between the plaintiff and defendant and the application of the equal treatment rule to all of the defendant's trading partners would lead to an estimate for $\beta_1 < 0$. Ceteris paribus, as the defendant removes the GATT/WTO violation (AD measure) that originally discriminated *against* the plaintiff (and, implicitly, *in favour* of third country exporters) towards a policy of 'equal treatment,' exports of i from the plaintiff rise and exports of i from third country suppliers would fall.

Consider a second example, where the defendant's initial violation V that is at the heart of the dispute was non-discriminatory in nature. A concrete example would be a defendant that initially imposed an MFN-based safeguard measure that restricted imports of i from all of its trading partners. Nevertheless, suppose, again, that the measure was inconsistent with GATT/WTO rules because the defendant failed to show that its domestic producers of i had been injured. In this case, an economically successful resolution to the bilateral dispute between the plaintiff and defendant accompanied by an application of the equal treatment rule to all of the defendant's trading partners would lead to an estimate for $\beta_1 > 0$, where might define $\beta_1 = 1$ as evidence of a 'full' multilateralization, or a one-for-one increase of third country exports with plaintiff exports in the disputed sector.

Our particular categories for the various defendant *violations* under consideration in V are listed in table 2. A priori, we expect that interacting the $IMP\_LIB^i_{d,p}$ variable with indicators for a defendant violation of the implementation of safeguards, quantitative restrictions or domestic (standards, subsidies, internal taxes) policies would likely lead to a multilateralization of successful bilateral trade liberalization gains ($\beta_1 > 0$), since the initial violation was less likely to have been discriminatory in its treatment of trading partners. On the other hand, interacting the $IMP\_LIB^i_{d,p}$ variable with indicators for an initial defendant violation of the implementation of a country-specific antidumping or countervailing duty measure is more likely to result in third country exports falling ($\beta_1 \leq 0$), owing to the application of the equal treatment rule, given the initial discriminatory implementation of protection.

3.1.2. The two-stage least squares framework

With respect to the underlying equations (1) and (2), it is likely that $\epsilon_{d,p}$ and $\epsilon_{d,h}$ are correlated, which would lead OLS estimation of equation (2) alone to provide inconsistent estimates for β_1.[17] Therefore, we proceed with two-stage least squares estimation – first estimating equation (1) and then using the parameter estimates to generate predicted values of $IMP\_LIB^i_{d,p}$ to be used in

17 For a discussion on the method of indirect least squares used here, see, for example, Baltagi (1998).

TABLE 2
GATT/WTO violations and third country representation in the trade dispute data set

Defendant's initial GATT/WTO violation	Underlying disputes (third countries)	Disputes with plaintiff receiving import growth between $t-1$ and $T+3$ (third countries)	Disputes with plaintiff not receiving import growth between $t-1$ and $T+3$ (third countries)
Safeguard measure	5 (228)	3 (207)	2 (21)
Quantitative restriction (quota or tariff rate quota)	8 (104)	5 (54)	3 (50)
Domestic policy (standards, subsidies, internal tax regime)	13 (376)	4 (157)	9 (219)
Antidumping measure	11 (225)	5 (123)	6 (102)
Countervailing duty	11 (176)	6 (134)	5 (42)
Rules of origin, licensing, or tariff classification	6 (257)	2 (141)	4 (116)
Tariff measure or tariff preference	9 (337)	6 (239)	3 (98)
Other non-tariff measure	4 (80)	2 (27)	2 (53)
Total	67 (1783)	33 (1082)	34 (701)

NOTE: A 'third country' is revealed by the six-digit HS import data as also exporting the disputed product i to the defendant country at least once in $t-1$, t, T, $T+1$, $T+2$ or $T+3$, but is not a country that has filed a dispute against the defendant country over the disputed product i.

the estimation of equation (2). In the next section we discuss the construction of the variables and the data used in the estimation.

3.2. Variable construction and data

3.2.1. Disputed sector import growth

Consider, first, the import growth variables $IMP\_LIB^{i}_{d,h}$, that is, the dependent variable in equation (2), and $IMP\_LIB^{i}_{d,p}$, that is, the dependent variable in equation (1) and the explanatory variable of interest in equation (2). One concern is that, in both estimation equations, there are a large number of observations in which either plaintiff and/or third country exports to the defendant in the six-digit HS product of the disputed sector were zero in either $t-1$ or $T+3$. This generates problems for standard growth rate measures, so to deal with this issue, we use the approach suggested by Davis and Haltiwanger (1992), and we define the import growth rates as

$$IMP\_LIB^{i}_{d,p} \equiv \frac{IMP^{i}_{d,p,T+3} - IMP^{i}_{d,p,t-1}}{1/2(IMP^{i}_{d,p,t-1} + IMP^{i}_{d,p,T+3})}, \qquad \text{and}$$
$$IMP\_LIB^{i}_{d,h} \equiv \frac{IMP^{i}_{d,h,T+3} - IMP^{i}_{d,h,t-1}}{1/2(IMP^{i}_{d,h,t-1} + IMP^{i}_{d,h,T+3})}, \tag{3}$$

where $IMP^{i}_{d,p,t-1}$ ($IMP^{i}_{d,h,t-1}$) is the real dollar value of the defendant's disputed sector i imports from the plaintiff (third country) at time $t-1$. These measures of import growth are symmetric around zero, and they lie in the closed interval $[-2,2]$ with trade flows that end (start) at zero corresponding to the left (right) end point.[18] In our sensitivity analysis we also report results both with alternative growth rate measures and for import growth over alternative time periods. The import growth variables of equation (3) that are used in estimating equations (1) and (2) are generated from six-digit HS import data available from UNCTAD (1995, 2001). We next turn to a discussion of the construction of the other explanatory variables used in the estimation.

3.2.2. Retaliation threats

Next, consider the potential retaliation costs of the failure to liberalize captured in $R_{d,p}$ of equation (1). The explanatory variable is defined as the share of the defendant's total exports sent to the plaintiff, and it proxies for the plaintiff country's capacity to retaliate. This captures the plaintiff's ability to impose costs on the defendant: the more reliant are the defendant's exporters on the plaintiff's import market, the more liberalization the plaintiff would be expected to receive. The export data are taken from Feenstra, Lipsey, and Bowen (1997) and Feenstra (2000).

In the estimation equation (2) of interest, $R_{d,h}$ proxies for the capacity of the *third* country to retaliate against the defendant in a future dispute. Such a dispute could take place, for example, if the defendant liberalized imports in its disputed sector in a GATT/WTO-inconsistent manner that impaired the third country's expected benefits. In order to determine which third countries would be eligible to initiate such a future dispute, we refer to the GATT/WTO practice of using the 'substantial supplier' rule to define which countries are eligible to participate in compensation negotiations such as those that occur on the dispute settlement procedure. A substantial supplier is typically defined as a country whose share of the disputed import market in question is at least 10%.[19] Thus, we use the import data to reveal whether a

18 Davis and Haltiwanger also 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.

19 A legal interpretation of one of the key areas of renegotiation under the GATT, Article XXVIII, concludes that 'during the meeting of the Committee on Tariff Concessions in July 1985, it was stated that the "10% share" rule had been generally applied for the definition of "substantial supplier"' (WTO 1995, 941).

particular third country supplies at least 10% of the defendant's disputed import market, and we then indicate this with a dummy variable and interact it with a measure of the share of the defendant country's total *exports* received by the third country. The higher this share, the more reliant are the defendant's exporters on the third country's markets, the greater is the third country's capacity to credibly threaten a retaliation, and the more import liberalization from the defendant the third country would expect to receive.

3.2.3. International obligation

A second potential cost facing a defendant that fails to comply with GATT/WTO rules is the 'international obligation' postulated by Kovenock and Thursby (1992). Again, in equation (1) we capture this cost in I_1 by interacting a variable indicating whether a panel report was issued finding the defendant guilty with indicators that the dispute occurred during the WTO tenure and the plaintiff was a country aside from one of the four primary litigants (the United States, EU, Canada, or Japan). We expect this variable to have a positive impact on the defendant's bilateral liberalization towards the plaintiff in the disputed sector. Data on the panel rulings of disputes were compiled from Hudec (1993) and panel reports.

With respect to the defendant's multilateralization decision, in equation (2) we represent the cost of 'international obligation' in I_2 through an indicator of whether the third country officially intervened in the dispute settlement process as an interested party. The theory is that defendant countries may be more likely to extend liberalization to countries that signal their interest in the dispute by following the GATT/WTO procedure through an official intervention. The defendant's failure to liberalize could lead to political costs associated with disregarding GATT/WTO procedures and rulings. Thus, we also expect third countries that officially intervene to enjoy greater liberalization than countries that do not. Data on third party interventions was compiled from official correspondence between the third parties and the GATT/WTO, as well as from individual panel reports.

3.2.4. Macroeconomic and trade-related variables

The primary task of the estimation is to focus on the impact that the import growth that is extended by the defendant to the plaintiff has on import growth that is extended by the defendant to exporters in third countries. Our interpretation for estimates of the key parameters of interest, β_1, will be inaccurate if we omit other variables from the estimation that affect the defendant's disputed sector import growth.

First, we control for import growth in the defendant's disputed sector that is due not to liberalization decisions but instead to macroeconomic or other forces. Therefore, we include a measure of bilateral 'all other good' (non-sector i) import growth of the defendant country from the plaintiff between the beginning of the dispute and the year after the end of the dispute in

equation (1). This variable controls for the trade of certain country pairs becoming more integrated (e.g., the United States and Canada in their free trade area starting in the late 1980s), which naturally would lead to an increase in sector i trade between the pair that is unrelated to the result of dispute settlement negotiations. Also, in equation (2) we include a comparable variable measuring the bilateral 'all other good' import growth of the defendant country from the third country over the same time horizon, expecting the same positive relationship.[20]

Furthermore, we also use data on the relative change in the bilateral plaintiff/defendant exchange rate in equation (1) as well as the relative change in the bilateral third country/defendant exchange rate in equation (2). The variable is defined as the relative change in the amount of plaintiff (third country) currency required to buy one unit of the defendant's currency. Therefore, an increase in this variable implies a depreciation of the plaintiff (third country) currency, relative to the defendant, which we would expect to be associated with more export growth of the plaintiff (third country) to the defendant, ceteris paribus. The exchange rate data is derived from IMF (2002).

Third, we also control for exporting country, sector i-specific supply shocks by defining two additional variables. In equation (1) we include the growth rate of the plaintiff country's exports of the disputed product i to the rest of the world's (ROW's) (non-defendant) markets over the period of the dispute, that is, between $t-1$ and $T+3$. In equation (2) we include a similarly constructed variable defined as the growth rate of the third country's exports of the disputed product i to the ROW's markets between $t-1$ and $T+3$. We expect each of these variables to be positively associated with defendant country import growth in the disputed product in the respective equation.[21]

Finally, we also control for initial conditions in the defendant's disputed import market. We thus include a variable measuring the third country's share of the disputed import market in $t-1$. In a related context, Clausing (2001) suggests a positive relationship under the theory that a low share of the initial import market may signal that the exporter does not have a comparative advantage in the industry and thus should expect little export growth in favor of countries which have a comparative advantage which would expectedly have a larger initial share of the import market. All of the data on sector i imports and exports described in this section are also derived from UNCTAD (1995, 2001).

20 We have also included defendant GDP growth over the time period in alternative specifications and the results do not change. For parsimony, we have excluded this control variable here.

21 Omitted from the regressors described in this section are the exporting country's product-specific export supply elasticities, which would best control for each country's ability to respond to liberalization opportunities presented by the defendant country. Construction of elasticities for the necessary products and countries is beyond the scope of the current analysis, and the variables introduced in this section are admittedly an ad hoc attempt to control for this issue.

3.2.5. Other controls

The D_1 and D_2 matrices include additional controls. First, in different specifications we control for the nature of the defendant's initial violation under dispute as defined in table 2. The theory is that different types of defendant violations may be more or less difficult to bring into GATT/WTO-compliance, and this may result in more or less liberalization that is independent of the products, countries, or other factors involved in the dispute. Data for categorizing the dispute into these eight different *violation* categories were compiled by the author from Hudec (1993) and various GATT/WTO panel reports. For cases in which more than one type of violation was under dispute, we make a judgment as to which disputed measure appeared to be most important. The categories for the trade barrier violations are, with slight modification, the categories found in Jackson (2000, table B-9).

In various specifications we also control for the *sector* under dispute. We include sixteen different industry categories, 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 country fixed-effects and indicators for the period in which the dispute was initiated. For example, owing to the increased '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. Finally, we also include a measure of distance between the exporting country and defendant in estimating equation (2), to control for the concern that certain countries may not be as responsive to liberalization opportunities because of distance.[22]

Notably absent from the analysis are industry-level political and economic variables that are typically used 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. Unfortunately, the industry-level time series of data necessary for our analysis is not readily available. Thus, we attempt to account for these political-economic features with our sector and violation controls, with the associated caveat that this is a limitation of the current study.

3.3. Additional estimation issues

Before proceeding to the estimation, we turn to a discussion of two potential problems created by selection bias: one that can be addressed econometrically and one that cannot.

22 The distance measure is the log of the kilometre distance between capital cities in the two countries.

3.3.1. Selection bias: plaintiff or a third country?

One potential concern with the approach described thus far is that the third country exporters in our sample are not random, since many of them are countries that could have chosen to be a plaintiff in the dispute but did not so choose. Therefore, we control for the possibility of sample selection bias by formally introducing a selection equation. In the selection equation we take as given that a dispute has been initiated, but we assume that an exporting country then makes a {*Plaintiff*, *Third Country*} decision regarding its role in the dispute.

More formally, rewrite the *j*th observation of the underlying estimation equation (2) of interest as $y_j = x_j\beta + \epsilon_{d,h,j}$, and assume $\epsilon_{d,h,j}$ is distributed $N(0,\sigma)$ for the instance that the exporting country has made the decision to remain simply as a third country in the dispute. Given that a dispute has been filed, suppose that any country that exports the disputed product to the defendant country first faces the decision of whether it should join the dispute as a plaintiff, and assume therefore that

$$Pr(y_j \text{ is observed}|z_j) = Pr(\eta_j > -z_j\gamma) = 1 - \Phi(-z_j\gamma) = \Phi(z_j'\gamma), \tag{4}$$

where z_j is a matrix of covariates affecting the {*Plaintiff*, *Third Country*} decision, γ is a vector of parameters to be estimated, and we assume $\Phi(.)$ is the cumulative normal distribution function for the error term, η_j, thus yielding the probit model. If corr $(\epsilon_{d,h,j}, \eta_j) = \rho \neq 0$, the problem with estimating equation (2) alone is that our estimates for β will be biased. Therefore, we use the Heckman (1979) selection bias correction procedure, and the result is maximum likelihood estimation of the following log likelihood function for observation *j*:

$$l_j = \delta_j \left\{ \ln \left[\Phi \left(\frac{z_j\gamma + (y_j - x_j\beta)\rho/\sigma}{\sqrt{1-\rho^2}} \right) \right] - \frac{1}{2} \left(\frac{y_j - x_j\beta}{\sigma} \right)^2 - \ln (\sqrt{2\pi\sigma}) \right\} + (1 - \delta_j)\Phi(-z_j\gamma), \tag{5}$$

where $\delta_j = 1$ if the exporting country is a third country only, and $\delta_j = 0$ if the exporting country is a plaintiff. Maximum likelihood estimation of (5) provides consistent and asymptotically efficient estimates for the β parameters of interest of the underlying equation (2).

In order to estimate equation (5), however, we require data on determinants of the decision of an exporting country between becoming a plaintiff versus free-riding on the efforts of another plaintiff country in the dispute and simply remaining as a 'third country.' To address this concern and therefore control for the potential selection bias, we appeal to a lengthier discussion in Bown (2003), in which a formal analysis of this and related litigation decisions in GATT/WTO dispute settlement is provided.

What affects a country's decision on whether it should avoid becoming a plaintiff in a dispute? The first criterion is eligibility, forcing us to eliminate from our data set all exporters that were not GATT/WTO members at the time of the dispute and thus were not eligible to initiate a dispute. Second, a given exporter will remain a third country if the expected costs of becoming a plaintiff are larger than the expected benefits.

When would the expected benefits to an exporter becoming a plaintiff be small? First, a given exporter would be more likely to remain simply a third country when it is only a small supplier to the defendant's disputed sector i market, measured both in terms of its share of the market and in real monetary terms. This would reveal the exporting country as having potentially little to gain from proceeding with a formal dispute. Second, it would be more likely to remain a third country if its import share of the defendant's disputed market had actually grown in the period before the case's initiation. This would be an indication that either its market access had not been restricted or that if it had, such a restriction of its expected market access would be more difficult to prove, resulting in a lower probability of winning the case.[23] Third, we similarly expect that an exporting country whose currency had depreciated between $t-1$ and t would be less likely to prove its case as a plaintiff, since it had potentially become relatively more competitive over the period.

Fourth, given the self-enforcing nature of the dispute settlement system, an exporter would be more likely to remain a third country the more 'powerless' it is, which we measure as the size of the defendant's exports sent to the exporting country. This may be thought of as proxying for the exporting country's capacity to retaliate against the defendant were it to become a plaintiff, 'win' the dispute, and become eligible to retaliate against the defendant. The export data we again take from Feenstra, Lipsey, and Bowen (1997) and Feenstra (2000). Furthermore, we also include a measure for the defendant's potential reliance on the exporting country for bilateral assistance – the less reliant is the defendant on the exporting country for its receipt of bilateral aid, the less the exporting country could threaten to withdraw, and thus the more likely would the exporter remain as only a third country. In this context, the retaliatory withdrawal of a small amount of aid by the exporting country would be only a small benefit. The bilateral aid data are derived from OECD (2001).

Next, the expected resource costs to an exporting country becoming a plaintiff for merely initiating a case as a plaintiff are not large, and that is all that is necessary for a country to be revealed as a plaintiff in our data set. However, we measure an additional cost as the exporter's reliance on the defendant country for bilateral assistance. The bigger the share of total aid

23 To construct these measures regarding trade in the disputed sector i, we again use the UNCTAD (1995, 2001) six-digit HS data for the $t-1$ and t periods.

received that derives from the defendant, the more likely is the exporter to remain simply as a third country.

Finally, we also recognize that an exporting country may be more likely to remain a third country given the nature of the defendant's alleged *violation* in the dispute. For example, if the dispute concerns the defendant's misuse of an antidumping measure against one particular exporter, other exporters may not be eligible to join the dispute as additional plaintiffs because they were not harmed by the defendant's action. Thus we control for this issue by including dummies for the various alleged GATT/WTO-inconsistent policies employed by the defendant.

3.3.2. An additional potential bias: the initiated disputes

A final concern that cannot be addressed through bias correction techniques involves potential biases in the data, given the selection of which disputes countries have chosen to initiate.[24] Our approach takes the initiated set of disputes as given. Therefore, it is likely that our sample of data contains an over representation of disputes in which the plaintiff expects to enjoy most of the benefits of the outcome. Put differently, even for the initial *violations* that did involve the defendant discriminating between trading partners, since the MFN rule potentially provides a positive externality to third country exporters that allows them to free ride off the efforts of the plaintiff, we would expect plaintiffs to initiate only disputes in which it is less likely that any trade liberalization gains will be multilateralized.[25]

We argue that our approach does address much of the potential problem introduced by this issue, since we estimate the distinct impact of the equal treatment rule for different types of GATT/WTO *violations*. For example, relative to the underlying population of activity inconsistent with GATT/WTO rules, plaintiffs may indeed initiate more than the average number of disputes concerning antidumping measures. As such, the removal of this type of a GATT/WTO-inconsistent measure would benefit primarily the plaintiff and would expectedly be associated with exports from third countries to the defendant falling, since their implicit preferential treatment has been eliminated. Since our approach to estimating equation (2) investigates the impact of the equal treatment rule for each type of in'itial defendant *violation* separately, our results should not be biased.

24 The trade disputes in our data set are not limited to cases in which the defendant was 'found guilty.' In the attempt to generate as many as possible legitimate allegations of GATT/WTO-inconsistent import protection to avoid sample selection bias problems, a case is included in the sample even if it was settled before the imposition of a panel. Finally, for the 1991–94 period, the data set includes not only Article XXIII cases, but also those that were brought to the separate dispute settlement fora of the 1979 Tokyo Round Codes such as the Antidumping Code and the Subsidies Code, which are found in WTO (1997).

25 Formal bias correction techniques cannot address this problem, since we have no statistical knowledge of the sample of activity that is inconsistent with country's GATT/WTO obligations that goes unreported.

Nevertheless, one could make the argument that within a type of defendant's GATT/WTO-inconsistent policy *violation* listed in table 2, our sample may still be biased. For example, consider the underlying population of non-discriminatory activity that is nonetheless inconsistent with GATT/WTO rules – for example, take the misapplication of a safeguard measure that would typically affect many exporting countries. A legitimate concern is that, relative to the underlying population of GATT/WTO-inconsistent safeguard measures, plaintiffs may tend to initiate disputes only where they stand to gain the most from the removal of the violation. We argue that even in this instance, the empirical approach that we have described thus far helps to address the problem of any potential bias. First, it is important to recall that we use the data of the defendant country's six-digit HS imports to reveal the identity of third country exporters in the sample. Therefore, if the data reveal that very few third countries also export the disputed product to the defendant, the fact that the plaintiff enjoys most of the benefits would not necessarily lead to a biased impact on the third country exporters revealed by the data. Second, our other explanatory variables that control for the third country's propensity to export the disputed product should also help to address any potential bias. Nevertheless, any remaining sample selection problems may tend to bias our estimates against finding a successful impact of the equal treatment rule on third country exporters. Thus, any evidence we find in favour of the equal treatment rule may underestimate its true impact in practice.

3.4. Descriptive analysis

This data collection approach initially yields 79 bilateral (plaintiff/defendant) trade dispute observations for the period under consideration, 1991–98, of which there were 67 distinct disputes.[26] From these bilateral disputes concerning legitimate allegations that the defendant has offered excessive import protection, we have 1,783 third country/defendant observations identified by the data to be used in the estimation of equation (2). The data include 18 different defendant countries, 26 different plaintiff countries, and 108 different third countries. Table 1 provides counts as to the number of times a particular country was a defendant, plaintiff, or third country in this data set.

Furthermore, table 3 presents summary statistics on the 1,783 third country/defendant observations of the variables used in the second-stage estimation. The lower half of this table also reviews the expected sign of the parameters on the various explanatory variables used in equation (2). The upper half of table 3 presents summary statistics and predicted signs for the variables used in the estimation of the selection equation described in section 3.3.1.

26 The twelve other disputes involved a different plaintiff filing a similar dispute against the defendant over the same disputed sector and were thus 'aggregated' into another dispute.

TABLE 3
Summary statistics for the maximum likelihood estimation

Variables	Predicted sign	Mean	Standard deviation	Minimum	Maximum
Selection equation (1862 observations)					
Dependent variable					
Indicator equal to 1 if the exporter is a third country only (i.e., not a plaintiff)		0.9576	0.2016	0	1
Explanatory variables					
Exporting country's share of the defendant's import market for i in $t-1$	Negative	0.0253	0.0977	0	0.9975
Exporting country's value of exports sent to the defendant's import market for i in t	Negative	0.0008	0.0100	0	0.2767
Growth in exporting country's share of the defendant's import market for i between $t-1$ and t	Positive	0.0322	1.0640	−2	2
Depreciation of exporting country's currency relative to the defendant between $t-1$ and t	Positive	−0.0731	0.2986	−2	1.9769
Share of total bilateral assistance received by the exporting country that derives from the defendant	Positive	0.1985	0.2939	0	1
Share of total bilateral assistance received by the defendant that derives from the exporting country	Negative	0.0047	0.0562	0	0.9683
Exporting country's value of total imports sent from the defendant	Negative	0.0106	0.0259	0	0.1795
Regression equation (1783 observations)					
Dependent variable					
Defendant import growth from third country (i.e., $IMP\_LIB^{i}_{d,h}$) in disputed sector between $t-1$ and $T+3$		0.3117	1.2911	−2	2
Explanatory variables					
Equal treatment variables					
Defendant import growth from plaintiff (i.e., $IMP\_LIB^{i}_{d,p}$) in disputed sector between $t-1$ and $T+3$	Depends on violation	−0.0684	0.4035	−1.2785	1.1122
Retaliation/international obligation variables					
Third country export share to defendant country x Dummy variable that third country has 10% of defendant import share	Positive	0.0058	0.0357	0	0.6655
Dummy if the third country formally intervened as an interested third party	Positive	0.0393	0.1943	0	1

(*continued*)

TABLE 3 *concluded*

Variables	Predicted sign	Mean	Standard deviation	Minimum	Maximum
Other control variables					
Third country import share of defendant market for i in $t-1$	Positive	0.0165	0.0711	0	1
Third country growth rate of exports of i to fourth country markets between $t-1$ and $T+3$	Positive	0.2272	1.1203	−2	2
Defendant import growth from third country between $t-1$ and $T+3$ in all other sectors	Positive	0.1850	0.4470	−1.9400	1.9045
Depreciation of third country currency relative to the defendant between $t-1$ and $T+3$	Positive	0.3259	0.5204	−1.8448	2
Distance between third country and defendant	Negative	8.7863	0.7491	5.3468	9.8752
WTO-era dispute	Positive	0.7454	0.4358	0	1

4. Empirical results

In this section we report our results in three steps. First, we describe the estimation results of the determinants of the bilateral liberalization equation regarding defendant imports from the plaintiff, which follows Bown (2004a). Then we briefly discuss the maximum likelihood estimates of the selection equation of an exporting country choosing between engaging in the dispute as a plaintiff or simply remaining as a third country. Finally, in section 4.3 we turn to the focus of the estimation, the regression equation that considers the determinants of the liberalization extended by the defendant to third country exporters and the underlying question of the empirical success or failure of the GATT/WTO equal treatment rule in the trade dispute setting.

4.1. Estimation results of the plaintiff/defendant liberalization equation

Given our empirical approach, table 4 provides results from estimating the first stage equation (1) regarding the bilateral, plaintiff/defendant liberalization relationship. The estimated parameters will be used to construct the primary explanatory variable of interest in estimating equation (2) described in section 4.3. The first column presents the baseline estimates that are used in most specifications, while the second and third columns present additional specifications used in the sensitivity analysis.

The results in table 4 are consistent with those found in Bown (2004a), though the parameters are, in general, accompanied with larger standard

TABLE 4
Regression results from the bilateral disputes: defendant imports from plaintiff

Explanatory variables	Dependent variable is defendant import growth from plaintiff (i.e., $IMP\_LIB^{i}_{d,p}$) between $t-1$ and $T+3$ in disputed sector i		
	Baseline model, used in specifications (1) – (3) and (5) – (7)	Alternative growth rate variables, used in specification (4)	$T+2$ instead of $T+3$, used in specification (8)
Plaintiff export share to defendant country	0.888**	1.178*	0.801
	(0.369)	(0.675)	(0.511)
Panel determination of guilt *x* Plaintiff not the US, EU, Canada or Japan *x* Dispute started under the WTO	0.460*	0.344*	0.428*
	(0.236)	(0.388)	(0.241)
Plaintiff growth rate of exports of *i* to ROW between $t-1$ and $T+3$	0.422**	0.232	0.303*
	(0.172)	(0.134)	(0.164)
Defendant import growth from plaintiff between $t-1$ and $T+3$ in all other sectors	0.403**	−0.347	0.388
	(0.167)	(0.619)	(0.265)
Indicator if there were multiple plaintiff countries involved in the underlying dispute	−0.341*	−0.702***	−0.468**
	(0.190)	(0.190)	(0.194)
Depreciation of plaintiff currency relative to the defendant between $t-1$ and $T+3$	0.518**	0.851***	0.555*
	(0.182)	(0.206)	(0.295)
Disputed non-tariff measure dummy variable	−0.628*	−0.697	−0.432*
	(0.246)	(0.439)	(0.252)
Constant	0.129	0.422	0.150
	(0.210)	(0.412)	(0.215)
Observations	67	56	67
R^2	0.49	0.35	0.31

NOTES: In parentheses are White's heteroscedasticity-consistent standard errors, with ***, **, and * denoting variables statistically different from zero at the 1, 5 and 10% levels, respectively. Time *t* is the year of the start of the dispute and time *T* is the year of the end of the dispute. This estimation equation specification is adapted from Bown (2004a).

errors, which is not surprising given that we are focusing on a smaller sample of data here.[27] The variable measuring the defendant's share of exports sent

27 Bown (2004a) considers bilateral trade disputes during 1973–98 and uses four-digit SITC import data to construct the import variables of interest relating to equation (1) for the period 1973–90. We have focused here only on 1991–98 disputes for which we have the more disaggregated, six-digit HS import data. The gains to more observations over the longer sample would likely be more than offset by the measurement error introduced by looking for the indirect effects of bilateral dispute negotiations at the more aggregated four-digit level. Thus, we have focused only on the 1991–98 period here.

to the plaintiff is positive and significant, as suggested by the theory that the capacity for plaintiff retaliation has a strong impact on the defendant's liberalization decision. The international obligation variable interacting the panel guilt, WTO, and non-primary litigant country (i.e., not the United States, EU, Canada, or Japan) indicators is also positive and significant, indicating that these factors jointly lead to additional liberalization gains. Plaintiffs also receive less liberalization in disputes that involve either non-tariff measures (perhaps owing to the difficulty of policy reform) or *multiple* plaintiff countries. Finally, the other control variables are generally of the theoretically predicted sign and are consistent with other results that focus on a larger sample of data.

4.2. Estimation results of the selection equation

Before turning to the ultimate question of interest regarding the effectiveness of the equal treatment rule, we briefly discuss the parameter estimates for our application of the Heckman (1979) selection equation to address the potential of sample selection bias. The top rows of tables 5a and 6a document our results, which are broadly consistent with those found in Bown (2003).

Taking as given that a trade dispute has been initiated, an exporting country is more likely to remain a 'third country' (i.e., not join the disputed as a plaintiff) the smaller is its trade in the disputed market, measured both as a share of the defendant's import market and in real dollar value, and the larger was its growth in market share in the defendant's disputed import market in the previous period. An exporter is also more likely to remain a third country the less reliant is the defendant on the exporting country as measured through both the share of bilateral assistance it receives from the exporter and the real dollar value of the defendant's exports that are sent to the exporting country. We interpret the estimates of these last two parameters as suggesting that the smaller the exporting country's capacity to retaliate (or the expected benefits from any retaliation) against the defendant, the more likely that it will not join the dispute as a plaintiff but will simply remain as a third country. As these results are fairly consistent across specifications and are not the primary focus of the underlying question of interest in this paper, we will not further comment on them here.[28]

4.3. Estimation results of the third country / defendant liberalization equation

Consider finally the estimation of the third country / defendant liberalization equation (2). Once again, we take the parameter estimates of table 4 and use the estimation equation (1) to generate predicted values for $IMP\_LIB^{i}_{d,p}$. These

28 We have used alternative specifications for the selection equation and these led to qualitatively similar estimates for the underlying equation (2) parameters of interest. As the selection equation is not of particular interest to the questions addressed by this paper, we keep the variables in this equation constant across specifications.

predicted values are then used to find the parameter estimates of interest in equation (2) by maximum likelihood estimation of equation (5). Finally, we also correct the standard errors for heteroscedasticity by clustering on the underlying trade dispute. The lower half of table 5a presents our first set of results regarding the liberalization of disputed sector imports that the defendant extends to third country suppliers. First we comment on the results of the estimates for the control variables, before formally addressing the *equal treatment* question, starting in section 4.3.2.

4.3.1. Baseline specification and estimates for the retaliation, international obligation, and control variables

Consider the baseline specification (1) in table 5a and first focus on the estimates for the retaliation variable. When we interact the defendant's export share to the third country with an indicator for whether the third country has at least a 10% share of the defendant country's market and is thus a 'substantial supplier,' the parameter estimate is positive and significant, as suggested by the theory.[29] This result is fairly robust across specifications and is consistent with other research suggesting that retaliation threats influence trade policy decisions, as documented in related contexts by Bown (2004a,b). On the other hand, there is no evidence that a third country's formal intervention in the dispute settlement process as an interested third party has a positive impact on liberalization. The parameter estimate is negative and statistically significant, though this result is not robust to alternative specifications. Nevertheless, in no specifications that we report is the coefficient estimate for this variable ever positive and statistically significant, as we would have expected.

The next set of variables control for the 'other' factors which may affect the defendant's liberalization with respect to the third country in the disputed product. First, the estimate on the variable measuring the third country's share of the defendant's import market in $t-1$ is negative and significant, though this is inconsistent with the theory that a smaller initial presence in the market would lead to less import growth. Second, the variable on the third country's sector i export growth to the ROW (defined to control for exporting country sector-specific shocks) is positive and significant, as suggested by the theory. Disputes that are initiated under the WTO (as opposed to the GATT regime) are also more likely to result in liberalization, ceteris paribus. The remaining 'other' variables are not statistically different from zero in specification (1). Neither the increased integration of the defendant and third country (through import growth in all other sectors), exchange rate changes, nor distance

29 The parameter estimate (3.336) of specification (1) implies that, holding other factors constant, if the defendant increased its share of total exports sent to a third country by one percentage point, the third country would enjoy a 3.336 percentage point increase in its exports of the disputed product to the defendant.

TABLE 5a
Maximum likelihood results: selection equation and defendant imports from third countries

Explanatory variables	Baseline specification (1)	Add third country dummies (2)	Add measure dummies (3)	Alternative growth rate variables (4)
Selection equation:	Dependent variable is equal to 1 if the exporter is a third country only (i.e., not a plaintiff)			
Exporting country's share of the defendant's import market for i in $t-1$	−2.580*** (0.424)	−3.038*** (0.372)	−3.101*** (0.430)	−3.538*** (0.720)
Exporting country's value of exports sent to the defendant's import market for i in t	−6.070*** (0.958)	−4.931*** (1.579)	−4.946*** (1.261)	−3.839*** (1.128)
Growth in exporting country's share of the defendant's import market for i between $t-1$ and t	0.098*** (0.026)	0.192*** (0.061)	0.187*** (0.060)	0.141 (0.106)
Depreciation of exporting country's currency relative to the defendant between $t-1$ and t	−0.113 (0.134)	−0.212* (0.126)	−0.196 (0.127)	−0.093 (0.077)
Share of total bilateral assistance received by the exporting country that derives from the defendant	0.112 (0.126)	0.136 (0.254)	0.118 (0.263)	0.277 (0.266)
Share of total bilateral assistance received by the defendant that derives from the exporting country	−0.476*** (0.168)	−0.492** (0.215)	−0.562** (0.265)	−0.350 (0.637)
Exporting country's value of total imports sent from the defendant	−3.248*** (0.463)	−3.443** (1.686)	−3.539** (1.520)	0.494 (2.574)
Measure dummy variables	Yes	Yes	Yes	Yes

(*continued*)

TABLE 5a *concluded*

Explanatory variables	Baseline specification (1)	Add third country dummies (2)	Add measure dummies (3)	Alternative growth rate variables (4)
Regression equation:	Dependent variable is defendant import growth from *third country* (i.e., $IMP\_LIB^{i}_{d,h}$) between $t-1$ and $T+3$ in sector i			
Equal treatment variables				
Defendant import growth from plaintiff† (i.e., $IMP\_LIB^{i}_{d,p}$) x...				
...Dummies for the defendant country's various initial violations (see table 5b for estimates)	Yes	Yes	Yes	Yes
Retaliation/international obligation variables				
Third country export share to defendant country x Dummy variable that third country has 10% of defendant import share	3.336*** (0.445)	2.916*** (0.688)	2.721*** (0.766)	1.602 (1.188)
Dummy if the third country formally intervened as an interested third party	−0.129*** (0.044)	−0.210 (0.167)	−0.187 (0.163)	0.255 (0.207)
Other control variables				
Third country import share of defendant market for i in $t-1$	−3.359*** (0.670)	−2.485*** (0.664)	−2.451*** (0.599)	−1.623* (0.945)
Third country growth rate of exports of i to fourth country markets between $t-1$ and $T+3$	0.074*** (0.022)	0.058*** (0.023)	0.066*** (0.023)	0.071** (0.036)

Defendant import growth from third country between $t-1$ and $T+3$ in all other sectors	0.061 (0.065)	0.020 (0.098)	0.037 (0.097)	0.193 (0.187)
Depreciation of third country currency relative to the defendant between $t-1$ and $T+3$	−0.038 (0.059)	0.188* (0.111)	0.246** (0.101)	−0.147 (0.095)
Distance between third country and defendant	0.051 (0.040)	0.004 (0.050)	−0.006 (0.053)	−0.032 (0.076)
WTO-era dispute	0.249** (0.110)	0.271* (0.115)	0.359*** (0.124)	0.291* (0.134)
Sector dummy variables	Yes	Yes	Yes	Yes
Third country dummy variables	No	Yes	Yes	Yes
Measure dummy variables	No	No	Yes	Yes
Selection equation observations	1862	1862	1862	916
Regression equation observations	1783	1783	1783	844
Log-likelihood	−3125.57	−3061.66	−3054.41	−1571.71

NOTES: In parentheses are White's heteroscedasticity-consistent standard errors corrected for clustering on the underlying dispute, with ***, **, and * denoting variables statistically different from zero at the 1, 5, and 10% levels, respectively.

[†]Endogenously determined according to the equation given in table 4. Time t is the year of the start of the dispute and time T is the year of the end of the dispute. Each stage also estimated with a constant term whose estimates are suppressed.

TABLE 5b
The equal treatment question

Expanded results from table 5a *Regression equation (cont.)*: Explanatory variables	Baseline specification (1)	Add third country dummies (2)	Add measure dummies (3)	Alternative growth rate variables (4)
Equal treatment variables	Dependent variable is defendant import growth from *third country* (i.e., $IMP\_LIB^{i}_{d,h}$) between $t-1$ and $T+3$ in sector i			
Defendant import growth from *plaintiff*† (i.e., $IMP\_LIB^{i}_{d,p}$) *x*...				
...Defendant's initial violation of a safeguard measure	0.875*** (0.251)	0.959*** (0.221)	0.936*** (0.149)	1.124*** (0.120)
...Defendant's initial violation of a quantitative restriction	1.004*** (0.332)	0.704* (0.375)	0.613 (0.447)	0.317 (0.806)
...Defendant's initial violation of a domestic policy	0.093 (0.212)	0.190 (0.184)	0.111 (0.214)	0.245 (0.239)
...Defendant's initial violation of an antidumping measure	0.256 (0.177)	0.219 (0.143)	0.334 (0.230)	−0.118 (1.194)
...Defendant's initial violation of a countervailing duty	0.443 (0.619)	−0.200 (0.723)	−0.082 (0.544)	0.548*** (0.193)
...Defendant's initial violation of rules of origin, licensing, or tariff classification	−0.131 (0.577)	−0.458 (0.512)	−1.057 (1.401)	−0.004 (0.883)
...Defendant's initial violation of a tariff measure or tariff preference	−0.362 (0.337)	−0.146 (0.271)	−0.217 (0.334)	1.158 (0.875)
...Defendant's initial violation of other non-tariff measure	0.548 (0.511)	1.118* (0.659)	0.079 (0.802)	−1.069* (0.649)

NOTES: In parentheses are White's heteroscedasticity-consistent, standard errors corrected for clustering on the underlying dispute, with ***, **, and * denoting variables statistically different from zero at the 1, 5, and 10% levels, respectively.
†Endogenously determined according to the equation given in table 4. Time t is the year of the start of the dispute and time T is the year of the end of the dispute.

between the defendant and third country exporter are a statistically significant determinant of the defendant's disputed sector *i* import growth from the third country.[30]

4.3.2. Addressing the equal treatment question

Next, consider the coefficient estimates on the 'equal treatment variables,' reported in isolation in table 5b, which expands the results from the specifications of equation (2) presented in the lower half of table 5a. Focus again on the baseline specification (1).

Again, recall that we interact the constructed $IMP\_LIB^{i}_{d,p}$ variable with an indicator for the defendant's policy measure that is under dispute. For example, we expect that the three policies listed in the top three rows of table 5b might lead to the greatest possibility of the bilateral (plaintiff/defendant) trade gains' being multilateralized, since the defendant's initial violation was less likely to have been discriminatory for these categories. Is there evidence that the increase in disputed sector imports that the defendant extends to the plaintiff ($IMP\_LIB^{i}_{d,p}$) is extended to the third country exporters as well? For the case of GATT/WTO-inconsistent *safeguard* measures and *quantitative restrictions*, there is evidence from specification (1) in table 5b to support the claim that changes in bilateral trade between the plaintiff and defendant are being multilateralized to third countries. The estimates for β_1 for both of these particular categories of GATT/WTO violations are positive and statistically different from zero. In fact, the estimates of 0.875 for *safeguards* and 1.004 for *quantitative restrictions* are also not statistically different from one,[31] so that we cannot reject the hypothesis that a 1% change in defendant imports from the plaintiff leads to a 1% change in defendant imports from a third country as well. For the case of GATT/WTO-inconsistent *domestic* policies, however, the associated estimate for β_1 is not statistically different from zero in specification (1).

Consider, next, the estimates for defendant violations in which we would expect that the application of equal treatment between the plaintiff and third countries would result in third country exports' *falling* with an increase in plaintiff exports. For example, take the β_1 estimates for the disputes in which the defendant's initial violation was a country-specific *antidumping measure* or *countervailing duty*. Here, we would expect $\beta_1 \leq 0$, since any liberalization afforded by the defendant to the plaintiff through $IMP\_LIB^{i}_{d,p}$ may come at

30 We have also considered specifications where we redefine each of the defendant/third country control variables in equation (2) as its value *relative* to the similarly defined defendant/plaintiff country variable. For example, instead of third country distance from defendant, we included the third country distance from defendant relative to the plaintiff distance from the defendant. Use of such alternative variables did not change the basic pattern of results reported below.

31 For example, a simple t-test reveals that for the case of a *safeguard*, $(0.875 - 1)/0.251 = 0.498$. Therefore, we cannot reject the hypothesis that 0.875 is statistically different from one in this sample.

the expense of third country exporters who may have implicitly benefited from the defendant's original discriminatory measure against the plaintiff. While the parameter estimates from specification (1) in table 5b for these two policies are not negative, they are not statistically different from zero.

4.3.3. Initial robustness checks of the equal treatment question

Specifications (2) through (4) of tables 5a and 5b present alternative specifications as an initial sensitivity analysis. In specification (2) we add third country fixed effects to the regression equation. The results are qualitatively very similar to those reported in specification (1). Take, for example, the estimates for β_1 reported in table 5b. For the case of GATT/WTO-inconsistent *safeguard* measures and *quantitative restrictions*, the estimates of 0.959 and 0.704, respectively, are again not statistically different from one, so that we again cannot reject the hypothesis of full multilateralization. With the exception of the β_1 estimate for the other non-tariff measure category for the defendant's GATT/WTO-inconsistent policy that is now positive, the other estimates reported in specification (2) of table 5 are also not statistically different from zero, as was the case in specification (1).

Specification (3) of tables 5a and 5b adds dummy variables for the defendant's initial *violation* under dispute in equation (2), where the measures are again those listed in table 2. Consider, again, the estimates for β_1 reported in table 5b for the case of GATT/WTO-inconsistent *safeguard* measures and *quantitative restrictions*. While the estimate of 0.936 for the *safeguard* disputes is still not statistically different from one, in specification (3) we can no longer reject the hypothesis that the estimate for β_1 for disputes over *quantitative restrictions* (0.613) is statistically different from zero. One likely explanation is that including the indicators in V both independently and through an interaction with $IMP\_LIB^i_{d,p}$ introduces collinearity leading to imprecise estimates, given the relatively small number of underlying disputes. The other estimates reported in specification (2) of table 5 are still not statistically different from zero, including the *other non-tariff* measure category.

Finally, specification (4) uses the same specification as (3) but redefines all of the variables that relate to a growth rate between $t-1$ and $T+3$. Instead of using the Davis and Haltiwanger (1992) approach to defining the growth rate, this specification uses the conventional log growth rate measure, causing us to lose almost half of the third country observations from the sample (as well as eleven plaintiff/defendant observations in the estimation of equation (1) reported in table 4), since the log growth rate measure is undefined for any underlying data that take on a value of zero in either $t-1$ or $T+3$.[32] While the β_1 estimate for the *safeguard measure* violations is qualitatively unchanged, the

32 For example, if a third country exporter entered the market after $t-1$ or exited the market before $T+3$, the log growth rate measure for $IMP\_LIB^i_{d,h}$ would be undefined.

omission of entering and exiting third country exporters from the data set would make it appear that the estimates for β_1 for the *countervailing duty* and *other non-tariff measure* violations are statistically different from zero.[33]

4.3.4. Separating between the 'successful' versus 'unsuccessful' plaintiff/defendant disputes

In this section we further assess the robustness of our results by differentiating between disputes in which the bilateral (plaintiff/defendant) resolution was a failure versus one that was an 'economic success,' defined as an increase in defendant imports from the plaintiff (i.e., an observation in which $IMP\_LIB^{i}_{d,p} > 0$).[34] One question is whether the results from table 5b are driven by the *unsuccessfully* resolved disputes, for example, are the equal treatment results for the *safeguard measure* and *quantitative restriction* violations driven by the 'failed' disputes, that is, where third country exports fall when plaintiff country exports fall. Tables 6a and 6b thus report results of the estimation where we disentangle the 'successful' from the 'unsuccessful' ($IMP\_LIB^{i}_{d,p} \leq 0$) plaintiff/defendant dispute observations by interacting our equal treatment variables with a 0/1 indicator for the economic outcome of the bilateral dispute. The number of observations in each of these *violation* subcategories is reported in table 2.

With the exception of the interaction of the 'equal treatment variables,' specifications (5) through (7) of table 6a present identical specifications to those considered in specifications (1) through (3) of table 5a. The results on the retaliation, international obligation, and other control variables are mostly unchanged from the results reported in our discussion of table 5a; thus, we turn directly to the estimates relating to the equal treatment question.

Consider, then, the top half of table 6b, which reports estimates for $IMP\_LIB^{i}_{d,p}$ interacted with an indicator for the underlying *violation* and an indicator that the plaintiff/defendant dispute resulted in liberalization.[35] For the case of GATT/WTO-inconsistent *safeguard measures* and *quantitative restrictions*, there is again evidence from specification (5) to support the claim of successful multilateralization of trade liberalization gains to third country exporters. The β_1 estimates for each of these particular categories of

33 Note than unlike specification (2), the β_1 estimate for the *other non-tariff measure* category is now negative, further calling into question the robustness of the earlier result.

34 We have used other measures of the 'economic success' such as an increase in imports that is larger than the defendant's GDP growth over the time frame or increases in imports over slightly different time horizons, and the qualitative pattern of results is similar to those reported here.

35 We will not discuss the estimates presented in the 'failed' bilateral cases in the lower half of table 6b, that is, those that did not result in liberalization for the plaintiff, for two reasons. First, these cases are relatively less interesting because it is uncertain if one should expect defendant countries to follow the equal treatment rule when they fail to follow the rulings of dispute settlement panels and don't liberalize at all. Second, there are few results in the lower half of the table that are statistically significant and robust to slight changes in specification.

TABLE 6a
Sensitivity analysis for maximum likelihood results: selection equation and defendant imports from third countries

Explanatory variables	Baseline specification (5)	Add third country dummies (6)	Add measure dummies (7)	$T+2$ instead of $T+3$ (8)
Selection equation:	Dependent variable is equal to 1 if the exporter is a third country only (i.e., not a plaintiff)			
Exporting country's share of the defendant's import market for i in $t-1$	−3.023*** (0.452)	−3.089*** (0.444)	−3.275*** (0.315)	−3.235*** (0.387)
Exporting country's value of exports sent to the defendant's import market for i in t	−5.621*** (0.811)	−5.543*** (0.992)	−6.330*** (1.118)	−2.596*** (1.003)
Growth in exporting country's share of the defendant's import market for i between $t-1$ and t	0.101*** (0.026)	0.180*** (0.056)	0.164*** (0.050)	0.087*** (0.028)
Depreciation of exporting country's currency relative to the defendant between $t-1$ and t	−0.060 (0.087)	−0.154 (0.123)	−0.155 (0.116)	−0.032 (0.095)
Share of total bilateral assistance received by the exporting country that derives from the defendant	0.043 (0.037)	0.052 (0.194)	−0.001 (0.188)	0.173 (0.172)
Share of total bilateral assistance received by the defendant that derives from the exporting country	−0.184*** (0.045)	−0.252 (0.206)	−0.227 (0.243)	−0.588*** (0.229)
Exporting country's value of total imports sent from the defendant	−3.406*** (0.395)	−3.703*** (1.432)	−2.808** (1.303)	−3.103*** (1.095)
Measure dummy variables	Yes	Yes	Yes	Yes

Regression equation:	Dependent variable is defendant import growth from **third country** (i.e., $IMP\_LIB^{i}_{d,h}$) between $t-1$ and $T+3$ in sector i			
Equal treatment variables				
Defendant import growth from plaintiff† (i.e., $IMP\_LIB^{i}_{d,p}$) x...				
...Dummies for the defendant country's various initial violations (see Table 6b for estimates)	Yes	Yes	Yes	Yes
Retaliation/international obligation variables				
Third country export share to defendant country x Dummy variable that third country has 10% of defendant import share	2.830*** (0.534)	2.691*** (0.632)	2.194** (0.899)	2.452*** (0.676)
Dummy if the third country formally intervened as an interested third party	−0.051 (0.114)	−0.162 (0.164)	−0.169 (0.147)	−0.176 (0.166)
Other control variables				
Third country import share of defendant market for i in $t-1$	−3.082*** (0.706)	−2.613*** (0.631)	−2.445** (0.543)	−2.470*** (0.450)
Third country growth rate of exports of i to fourth country markets between $t-1$ and $T+3$	0.080*** (0.022)	0.072*** (0.023)	0.081** (0.022)	0.018 (0.027)
Defendant import growth from third country between $t-1$ and $T+3$ in all other sectors	0.059 (0.058)	0.011 (0.093)	0.007 (0.084)	−0.096* (0.058)
Depreciation of third country currency relative to the defendant between $t-1$ and $T+3$	0.021 (0.051)	0.279*** (0.084)	0.231*** (0.090)	0.215*** (0.083)
Distance between third country and defendant	0.038 (0.034)	−0.012 (0.052)	−0.013 (0.046)	−0.065 (0.043)
WTO-era dispute	0.040 (0.124)	0.058 (0.133)	−0.105 (0.156)	0.199** (0.094)

(*conitnued*)

TABLE 6a *concluded*

Explanatory variables	Baseline specification (5)	Add third country dummies (6)	Add measure dummies (7)	$T+2$ instead of $T+3$ (8)
Sector dummy variables	Yes	Yes	Yes	Yes
Third country dummy variables	No	Yes	Yes	Yes
Measure dummy variables	No	No	Yes	Yes
Selection equation observations	1862	1862	1862	1919
Regression equation observations	1783	1783	1783	1840
Log-likelihood	−3109.57	3046.43	3042.45	−3077.76

NOTES: In parentheses are White's heteroscedasticity-consistent standard errors corrected for clustering on the underlying dispute, with ***, **, and * denoting variables statistically different from zero at the 1, 5, and 10% levels, respectively.
[†]Endogenously determined according to the equation given in table 4. Time t is the year of the start of the dispute and time T is the year of the end of the dispute. Each stage also estimated with a constant term whose estimates are suppressed.

TABLE 6b
The equal treatment question under successful versus unsuccessful bilateral disputes

Expanded results from table 6a *Regression equation (cont.)*: Explanatory variables	Baseline specification (5)	Add third country dummies (6)	Add measure dummies (7)	$T+2$ instead of $T+3$ (8)
Equal treatment variables: Defendant import growth from *plaintiff*† (i.e., $IMP\_LIB^{i}_{d,p}$) x	Dependent variable is defendant import growth from *third country* (i.e., $IMP\_LIB^{i}_{d,h}$) between $t-1$ and $T+3$ in sector i			
Indicator for *increase* in actual defendant sector i imports from the plaintiff x...				
...Defendant's initial violation of a safeguard measure	0.759** (0.361)	0.830*** (0.284)	0.911*** (0.126)	0.551*** (0.139)
...Defendant's initial violation of a quantitative restriction	0.991*** (0.357)	0.938* (0.563)	0.181 (0.611)	0.182 (1.858)
...Defendant's initial violation of a domestic policy	−0.945** (0.428)	−1.131*** (0.417)	−1.261*** (0.444)	−0.507** (0.247)
...Defendant's initial violation of an antidumping measure	0.331* (0.178)	0.253* (0.153)	0.118 (0.365)	−1.561*** (0.504)
...Defendant's initial violation of a countervailing duty	−1.719*** (0.509)	−2.465*** (0.798)	−2.395*** (0.722)	0.785 (0.598)
...Defendant's initial violation of rules of origin, licensing, or tariff classification	−1.686*** (0.326)	−1.782*** (0.297)	2.159 (2.539)	−3.345 (2.389)
...Defendant's initial violation of a tariff measure or tariff preference	−0.037 (0.226)	0.146 (0.287)	0.044 (0.349)	−0.090 (0.304)
...Defendant's initial violation of other non-tariff measure	3.120*** (0.761)	3.322*** (0.566)	5.950*** (2.179)	4.858*** (1.396)

(*conitnued*)

TABLE 6b *concluded*

Expanded results from table 6a *Regression equation (cont.)*: Explanatory variables	Baseline specification (5)	Add third country dummies (6)	Add measure dummies (7)	$T+2$ instead of $T+3$ (8)
Indicator for *decrease* in actual defendant sector i imports from the plaintiff x...				
...Defendant's initial violation of a safeguard measure	−3.295** (1.526)	−1.675 (3.001)	−5.415 (4.388)	0.792* (0.459)
...Defendant's initial violation of a quantitative restriction	0.631 (0.571)	0.262 (0.512)	0.350 (0.585)	−0.149 (0.675)
...Defendant's initial violation of a domestic policy	0.720** (0.296)	0.930*** (0.287)	0.835** (0.396)	0.955*** (0.261)
...Defendant's initial violation of an antidumping measure	−0.074 (0.138)	0.048 (0.188)	−0.299 (0.367)	1.390 (1.145)
...Defendant's initial violation of a countervailing duty	0.940*** (0.190)	0.102 (0.495)	0.360 (0.407)	−0.574 (0.530)
...Defendant's initial violation of rules of origin, licensing, or tariff classification	0.737 (1.076)	0.097 (0.814)	6.242 (4.136)	1.515 (1.181)
...Defendant's initial violation of a tariff measure or tariff preference	−1.458*** (0.553)	−1.001 (0.745)	−2.068** (0.822)	2.665** (1.323)
...Defendant's initial violation of other non-tariff measure	−1.106 (1.171)	−0.127 (0.980)	−2.083 (1.488)	0.295 (0.629)

NOTES: In parentheses are White's heteroscedasticity-consistent, standard errors corrected for clustering on the underlying dispute, with ***, **, and * denoting variables statistically different from zero at the 1, 5, and 10% levels, respectively.
[†]Endogenously determined according to the equation given in table 4. Time t is the year of the start of the dispute and time T is the year of the end of the dispute.

GATT/WTO violations – including 0.759 for *safeguards* and 0.991 for *quantitative restrictions* – are not statistically different from one, so that we cannot reject the hypothesis that a 1% increase in defendant imports from the plaintiff leads to a 1% *increase* in defendant imports from a third country.

One new result from specification (5) and the 'successful' bilateral disputes is that the associated estimates for β_1 for GATT/WTO-inconsistent *domestic policies* (−0.945), *countervailing duties* (−1.719) and *rules of origin, licensing or tariff classification* (−1.686) are now negative and statistically significant. This is a distinct result when compared with table 5b, which suggests that combining the bilaterally successful and unsuccessful disputes hides the application of the equal treatment rule in some of these successfully resolved disputes. The implication is that for these types of GATT/WTO-inconsistent policies undertaken by the defendant, the trade liberalization extended to the plaintiff through $IMP\_LIB^{i}_{d,p}$ is coming *at the expense* third country exporters. For the latter two categories of GATT/WTO-inconsistent measures, this would be expected – as the defendant moves away from a GATT/WTO-inconsistent policy that discriminated against the plaintiff (and implicitly in favour of third country exporters) towards a policy of 'equal treatment,' increasing imports of *i* from the plaintiff are associated with falling imports of *i* from third countries. One potential explanation for the larger *negative* estimates (e.g., almost a 2% decrease in third country exports associated with a 1% increase in plaintiff exports) is that we are not effectively controlling for these third countries' being higher-cost suppliers of the disputed product than the plaintiff country.[36]

One puzzling result from table 6b concerns initial *antidumping* violations, which typically discriminate against the plaintiff (and implicitly in favour of third country exporters) and are thus cases in which we might also expect a negative estimate for β_1 for the bilateral disputes that are successfully resolved. Instead, in specification (5), the estimate is *positive* and statistically significant at the 10% level, though this estimate is not robust to alternative specifications. Even so, the point estimate for specification (5) of 0.331 is small relative to the estimated β_1 coefficient for the *safeguard* violations, so that the results do at least indicate an intuitive rank ordering between policies.

The other columns in the top half of table 6b report a sensitivity analysis. In specification (6) we add third country fixed effects, and in specification (7) we add dummy variables based on the nature of the defendant's initial violation. The pattern of parameter estimates confirming the effectiveness of the equal treatment rule for the *safeguards*, and *countervailing duty* violation categories are robust across specifications. On the other hand, the β_1 coefficient estimates for the *quantitative restrictions*, and *rules of origin, licensing or tariff classification*

36 Furthermore, while the estimate for β_1 associated with the *other non-tariff measure* category for the defendant's GATT/WTO-inconsistent policy is positive and statistically significant in the top half of table 6b, we remain sceptical as to the robustness of this result, given the relatively small number (27) of third country observations in this category (see table 2).

violation categories are no longer statistically significant in specification (7), again likely owing to the collinearity introduced when we include the V indicators both independently and when interacted with $IMP\_LIB^{i}_{d,p}$.

Specification (8) simply changes the time horizon to look at the $t-1$ to $T+2$ period instead of the $t-1$ to $T+3$ period. While the β_1 estimate for the *safeguard* violation category (0.551) is still positive and statistically significant, it is now statistically less than one for the $T+2$ period. The other β_1 estimates have changed as well. One potential explanation rests with the predicted values for $IMP\_LIB^{i}_{d,p}$ used in this particular specification. As reported in table 4, the first-stage regression variables explain much less of the variation in $IMP\_LIB^{i}_{d,p}$ over the $t-1$ to $T+2$ period for this particular subsample of data, and this may affect our parameter estimates of equation (2). Alternatively, if our earlier results are indicative of a pattern to the effectiveness of the equal treatment rule, this effectiveness may not fully come into effect until three years after the disputes' resolution.

Finally, it is useful at this stage to highlight some of the additional limitations of our approach. Again, there may remain some bias in our sample of disputes that countries have chosen to initiate, making it difficult to find evidence of the successful application of the equal treatment rule. Second, a one-for-one response of third countries' changing their exports along with exports from the plaintiff country may be unrealistic, given that we have not likely sufficiently controlled for all factors that affect the export propensity of plaintiff and third countries. Furthermore, we are also confronted with a relatively small number (67) of distinct, underlying disputes from which we are constructing our primary explanatory variable of interest in the estimation, $IMP\_LIB^{i}_{d,p}$. Nevertheless, even with these limitations, we have documented some interesting patterns of evidence that are consistent with the theory that defendant countries apply the equal treatment rule in bilaterally successful trade disputes.

5. Conclusion

This paper represents a first attempt to focus on a multilateral trade agreement with a functioning most-favoured-nation principle in order to empirically assess whether countries follow the equal treatment rule in practice. In the context of a sample of GATT/WTO bilateral dispute settlement negotiations occurring between 1991 and 1998 we find evidence that countries are successfully applying the equal treatment rule to GATT/WTO members in this setting. In successful bilateral disputes over GATT/WTO-inconsistent *safeguards or quantitative restrictions*, trade gains to plaintiffs appear to be multilateralized to third country exporters. In successful bilateral disputes over GATT/WTO-inconsistent *countervailing duties or rules of origin, licensing or tariff classification*, trade gains to plaintiffs appear to lead to the reapplication of equal treatment across plaintiffs and third country exporters.

The answer to the question of the effectiveness of the equal treatment rule has important implications for our understanding of the GATT/WTO system, especially given the recent proliferation of theoretical research investigating the role of the MFN principle. For example, if bilateral liberalization negotiations merely result in the systematic diversion of trade away from third country exporters (a concern raised by Bagwell and Staiger, 2004), a next logical argument would be that while the GATT/WTO includes an MFN clause, the economic impact of the GATT/WTO on trade flows in disputed sectors may not be all that different from what might occur from the negotiation of a set of discriminatory, preferential trading agreements.

Nevertheless, our evidence that defendant countries apply the equal treatment rule in bilaterally successful trade disputes is certainly not a confirmation that discrimination in trade policy is not prevalent in the world trading system. The proliferation of PTAs and country-specific antidumping protection is pointed evidence of the problem. The setting that we have chosen to investigate is simply one area where it is possible to empirically assess the question of whether countries follow the MFN rule in practice. Therefore, we do not attempt to extrapolate beyond our results in order to make a general statement regarding the success of the MFN clause in trade agreements. We consider only one area where it is possible to assess the relative performance of GATT/WTO rules designed to deal with these potential issues; we do not suggest that our results are necessarily robust to other settings. Though a more difficult estimation challenge, it may be even more informative to address the question of whether multilateralization successes also occur during the implementation of liberalization after *negotiating rounds*, as opposed to dispute settlement negotiations that have been under investigation here. We leave this question to future research.

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