

**Repeated-Game Approaches  
to GATT and WTO Dispute-Settlement Procedures**

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International trade agreements, by specifying the optimal strategies that countries implement in certain circumstances, resemble legally-binding contracts among member governments. However, in an overwhelming majority of cases, the contracts rooted in such agreements fail to identify the governments' best responses to all possible scenarios and, as such, ultimately prove incomplete. The incomplete nature of most accords simultaneously reflects governments' inability to foresee certain scenarios and, equally important, a reluctance to incur the massive costs associated with negotiating, adopting and enforcing a blueprint that addresses all contingencies. As a result, international trade agreements increasingly contain dispute-settlement procedures, or DSPs, in order to handle alleged violations of the agreed provisions, as well as to assess the legality of government responses to unexpected political or economic developments.

Economists frequently cite the Dispute-Settlement Understanding (DSU) as one of the most substantive developments that accompanied the creation of the World Trade Organization in 1995. The DSU purportedly remedies a number of the oft-cited shortcomings of Article XXIII of the General Agreement on Tariffs and Trade, the DSU's predecessor. The DSU, for instance, prevents countries, especially those accused of violations, from blocking the formation of dispute-settlement panels and the adoption of panel reports. Perhaps most importantly, however, the DSU restricts the severity of retaliatory measures imposed by injured countries. WTO officials report that, since 1995, countries have submitted a total of 284 cases for dispute-settlement. With the latest batch of reforms expected in May 2003, dispute-settlement seems certain to remain at the forefront of WTO-related research. Although economists initially characterized dispute-settlement procedures as mere "trigger strategies" used to enforce international agreements, later papers display a broader interpretation of such mechanisms, focusing on information gathering, relationship building and tariff renegotiating. Such efforts aside, however, present models still fail to capture several crucial features of dispute-settlement, as conducted in the WTO.

### **DSPs as Trigger Strategies<sup>1</sup>**

Modeling dispute-settlement procedures (DSPs) as trigger strategies constitutes perhaps the most widely-adopted approach to evaluating the effects of such mechanisms on efforts to liberalize

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<sup>1</sup> Staiger (1995) provides a useful survey of the earliest attempts to use repeated games as representations of dispute-settlement procedures. In addition to the papers noted in the survey, Riezman (1991) also offers a classic example of the repeated-game approach.

international trade. The literature includes a set of papers in which authors assume that governments select optimal protection levels in successive rounds of an infinitely-repeated, tariff-setting game. A non-cooperative equilibrium always exists in which governments, taking the behavior of each trading partner as given, choose the tariff levels that maximize national welfare in a single-shot stage game<sup>2</sup>. Successful attempts to attain a cooperative equilibrium, characterized as a mutually-beneficial, joint reduction in tariff levels, depend on the ability of member countries to design effective enforcement mechanisms<sup>3</sup>. An effective punishment path authorizes governments to raise tariffs to specified levels in response to a known violation of the agreement. In most cases, countries simply revert to the use of the non-cooperative, Nash tariffs—a punishment path typically denoted as a “trigger strategy.” If designed appropriately, the retaliatory measures raise the costs of deviation to unacceptable levels and, accordingly, provide countries with an economic incentive to remain in compliance. Most notably from the perspective of the present paper, authors frequently view such “trigger,” or Nash-reversion, punishment paths as synonymous with dispute-settlement procedures.

Hungerford (1991) presents one of the first representations of dispute-settlement procedures as trigger strategies. The paper assesses the performance of DSPs, when utilized in an environment characterized by economic uncertainty and asymmetric information. The author offers a two-country model in which, in the absence of a negotiated accord, each government utilizes tariff and non-tariff barriers to manipulate trade flows. Assuming that the countries successfully broker an agreement, the transparency of tariffs ensures automatic detection and punishment of any attempt to violate the related provisions. Full observability lends credibility to the countries’ threats to resort to the punitive Nash tariffs in the event of a defection—and accounts for the countries’ full compliance with the tariff-related obligations. As a result, the presence of an effective enforcement mechanism facilitates countries’ efforts to set tariffs at reduced levels.

In contrast, the opaque, and basically unobservable, nature of non-tariff barriers poses a serious challenge to enforcement. Thus, cooperation in the area of non-tariff barriers requires that countries choose an appropriate, observable variable to act as a signal of government compliance with negotiated reductions. To that end, countries choose a variable that moves with, and conveys information about, such non-tariff measures. Hungerford alleges that countries interpret movements

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<sup>2</sup> The non-cooperative tariffs, also known as “Nash tariffs,” solve the government’s unconstrained welfare-maximization problem in a single-shot game.

<sup>3</sup> Cooperation occurs when governments simultaneously select tariff levels with the objective of maximizing *joint* welfare. If enforceable, cooperation proves mutually-beneficial, or welfare-improving, for the countries involved.

in the terms of trade as indicators of the governments' "good behavior" with respect to non-tariff barriers. However, complications arise, given that terms-of-trade fluctuations occur in each of the following three scenarios: a random shock to supply, a random shock to demand or a government's calculated decision to boost non-tariff barriers. In other words, changes in the terms of trade offer a noisy signal, at best, and a false indicator, at worst, of government behavior.

Ideally, countries abandon the cooperative equilibrium and impose retaliatory measures only in cases where a terms-of-trade variation stems from a deliberate and prohibited action taken by a member government. Hungerford finds, however, that countries automatically revert to the use of trigger strategies<sup>4</sup> in response to any unacceptably-large, adverse movement in the terms of trade—irrespective of the underlying source of the fluctuation. Though opportunities to settle disputes exist, the model exhibits a capacity to generate inefficient breaches of negotiated accords—incidents that cast doubt on the effectiveness of DSPs as enforcement mechanisms in a more complex and, hence, more realistic environment.

Countries resort to the trigger strategy on an apparently indiscriminate basis, due to the fact that incomplete information prevents governments from accurately discerning the causes of terms-of-trade variations. Governments simply lack a surefire capacity to distinguish random, unavoidable changes in the terms of trade from intentional efforts to manipulate trade flows. As noted above, non-tariff barriers prove notoriously difficult to detect, as well as to quantify—features that make such measures attractive to countries seeking to raise protection levels while escaping detection and retaliation. Under such conditions, opportunities potentially exist for DSPs to play an additional, and perhaps more substantive, role as a means of gathering and disseminating information about alleged violations.

Thus, Hungerford modifies the dispute-settlement component of the original model and enables a country to launch a formal investigation, albeit at a monetary cost, into the cause of an excessive fluctuation in the terms of trade prior to unleashing any retaliatory measures. Perhaps not surprisingly, as countries increase the funds spent on the investigative component of the DSPs, the quantity and the quality of the information collected improves markedly. As a result, the probability of uncovering a trading partner's non-tariff barriers varies positively with the amount that a country expends. Each country faces a trade-off between engaging in rigorous monitoring, on the one hand, and containing costs, on the other hand. Given the costly nature of the process, therefore, countries

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<sup>4</sup> Hungerford assumes that countries employ trigger strategies that rely on the use of Nash tariffs, or tariff levels that maximize national welfare.

decline to invest the funds necessary to guarantee the revelation of illegal non-tariff barriers. Thus, Hungerford's newly-defined dispute-settlement procedures do not succeed in improving the flow of information within the model. Allowing DSPs to assume a more meaningful role fails to prevent unwarranted trade wars. In presenting such a weak characterization, the paper hardly sounds a ringing endorsement of dispute-settlement procedures<sup>5</sup>.

### **DSPs as Relationship Builders**

Kovenock and Thursby (1992) build on Hungerford's broader conceptualization of dispute-settlement procedures. As in the preceding paper, the authors claim that DSPs potentially enhance oversight of countries' compliance with international accords. More specifically, personnel assigned to administer DSPs at the multilateral level gather a stockpile of detailed data that assist countries in distinguishing between actual and perceived breaches. Without recourse to DSPs, governments face resource constraints that make individual efforts to collect equivalent data prohibitively costly. The paper's principal contribution, however, lies in the suggestion of a decidedly more controversial role for DSPs. In particular, the authors allege that a formal, institutional mechanism for settling disputes "attaches a face" to the multilateral trading system, instills in participating governments a heightened sense of belonging to the international community and ultimately contributes to a profound feeling of obligation within governments. Bound "psychically" to the international trading system, countries purportedly seem increasingly willing to recognize, as well as to fulfil, the responsibilities outlined in the international accords. As a result, deviating from trade agreements not only entails costs in terms of the welfare losses associated with reverting to an inferior equilibrium characterized by the use of Nash tariffs. Violators also incur fixed, and largely implicit, "psychic" costs in the form of weakened ties to the international community.

In other words, defecting countries suffer a loss of reputation or goodwill among the other members—an outcome that likely affects the deviating country's ability to pursue national positions in trade and other negotiations in the future. In general, though, as the costs of defection mount, governments perceive cooperation as an increasingly attractive strategy. Thus, if the degree of trade liberalization attainable appears inversely related to the severity of the punishment afforded by an agreement, then the additional "psychic" costs associated with DSPs presumably enable countries to reduce trade barriers even further. Although Kovenock and Thursby certainly deserve praise for the

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<sup>5</sup> An interpretation of Hungerford's results also shared by Staiger (1995) and Maggi (1999).

argument's originality, the paper's primary weakness lies in the lack of a thorough discussion, on the one hand, of the mechanisms through which dispute-settlement procedures generate a sense of duty and, on the other hand, of the ways that such bonds assist the workings of DSPs .

### **DSPs in Multilateral and Regional Settings: Added Strength in Numbers?**

Maggi (1999) suggests yet another role for dispute-settlement procedures, especially at the multilateral level. Questions naturally arise as to whether DSPs operate more effectively or possess special advantages in a multilateral, as opposed to a bilateral, setting. Maggi initiates such an inquiry, motivated to an understandable extent by a perceived resurgence in governments' interest in bilateral and regional trading arrangements. Overall, the paper finds that, in theory, multilateral DSPs "level the playing field" within the international trading system and, at least partially, redress imbalances of power among assorted countries.

In particular, Maggi designates countries as either "strong" or "weak," based on the extent to which the corresponding national economies suffer losses in the event of a trade dispute. Suppose, for example, that country A possesses two trading partners, countries B and C. Differences in factor endowments contribute to a scenario in which, on a net basis, country A imports from country B and exports to country C<sup>6</sup>. Therefore, according to Maggi's criteria, country A enjoys a position of "strength" with respect to country B, while occupying a position of "weakness" vis-a-vis country C. Moreover, the labels capture country A's uneven capacity to inflict injury on countries B and C in a trade war. Consequently, when trilateral trade disputes lead to concurrent government actions raising tariffs to Nash levels, country A inflicts damage on country B, while incurring losses at the hands of country C<sup>7</sup>.

In order to appreciate fully the added value of invoking dispute-settlement procedures in a multilateral setting, consider the following scenario. Suppose, for example, that country A concludes a bilateral agreement with country C, which enjoys the additional bargaining power derived from the aforementioned "strong" position vis-a-vis country A. Within the bilateral accord, country C not only extracts tariff concessions of a greater magnitude from country A, but also proves capable of unleashing punishment of greater severity in the midst of a trade war. The latter result holds, even if

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<sup>6</sup> Alternatively, country A imposes higher tariffs on country B than on country C.

<sup>7</sup> A rise in country A's tariffs hurts demand for imports from country B, whereas country A's exporters suffer a similar decline in demand on account of higher tariffs in country C.

country A automatically responds to a violation with the imposition of Nash tariffs. On the one hand, since country A purchases relatively few goods from country C in the first place, the capacity of such tariff hikes to inflict losses on country C's exporting firms appears limited. On the other hand, the initial deviation hurts country A's firms, which rely heavily on demand from country C's consumers, significantly.

By embedding the bilateral agreement within a multilateral accord that also includes country B, however, country A manages to neutralize country C's "size" advantage. More specifically, in the multilateral case, violations of the accord appear optimal only when committed against both trading partners. Accordingly, when deviating, country C confronts the collective might of countries A and B, instead of the punishment dispensed solely and rather ineffectively by country A. The increased severity of the sanctions enables countries to reduce the tariffs, and raise the payoffs, associated with a cooperative equilibrium. Moreover, the shared benefits obtained through multilateral enforcement increase with the magnitude of the bilateral power imbalances.

Maggi further notes that DSPs also play a valuable informational role that complements, and to a certain extent even augments, the multilateral enforcement mechanism outlined in the preceding paragraph. DSPs disseminate detailed information concerning countries' fulfillment of trade-related obligations. Suppose, for example, that country C violates a bilateral accord concluded with country A. No guarantee exists that knowledge of country C's misbehavior also extends to country B. Thus, country C potentially avoids any negative spillover into trade relations with country B. If, however, country C initiates a trade war with country A in the context of a multilateral agreement, then the DSPs inform all signatory countries of the violation. As a result, country C faces the prospect of reputational losses among third countries. As noted by Kovenock and Thursby, such an erosion of goodwill hinders a country's capacity to negotiate future concessions in trade, as well as in other, matters. In general, therefore, Maggi concludes that multilateral dispute-settlement advances the interests of weak countries. Although advocates of developing-country interests often challenge that notion, a pair of recent publications by Bown (2002a; 2002b) lend additional support to Maggi's findings.

Levy and Srinivasan (1996) similarly highlight the performance of DSPs at the multilateral level—albeit for an decidedly different reason<sup>8</sup>. The paper assesses the welfare implications of a key procedural difference between DSPs associated with multilateral agreements and similar mechanisms

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<sup>8</sup> Levy and Srinivasan cite an earlier 1994 version of the Maggi paper.

incorporated into regional accords. Specifically, whereas multilateral DSPs<sup>9</sup> only permit national governments to file formal complaints, regional bodies<sup>10</sup> frequently also grant private parties the authority to launch legal proceedings. The private parties exercising such legal authority often include labor unions, producer groups, activists and various non-governmental organizations (NGOs). The authors seek to uncover the likely economic consequences of providing private parties with similar access to DSPs within the WTO. To that end, the paper develops a two-country model in which public welfare depends on the state of political and economic conditions, as well as the government's chosen course of action with respect to activating the DSPs. The welfare of private agents, on the other hand, solely reflects the health of the local economy and the government's policy response—not the prevailing political climate.

The authors present a strategic game with four stages. First, the governments negotiate a contract that identifies acceptable courses of action, conditional on the observed state of domestic political and economic affairs. Second, the governments observe the realizations of relevant political and economic variables. Third, based on such observations, the governments determine whether or not to initiate a dispute. Lastly, where permitted, private agents make a separate decision of whether or not to launch dispute-settlement proceedings. All parties act on the basis of perfect information. In general, filing a dispute only proves beneficial to the governments in the dual context of a weak domestic economy and a positive, domestic political environment. In contrast, private agents always favor action in the face of an economic downturn, regardless of the hospitality of the local political climate.

Solving the game using backward induction results in the following equilibrium outcomes. In the multilateral case, private actors lack the capacity to act, while the two governments behave as outlined above, initiating DSPs only in the event that domestic political and economic conditions appear positive and weak, respectively. Moreover, the two governments always adopt the contract, since participation never compels either country to pursue an inefficient path. However, in the regional case, private actors coerce governments to file trade disputes in the midst of an economic downturn, independent of the political environment. Being forced to act suboptimally in certain situations even complicates the governments' decision to adopt the contract. More specifically, the

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<sup>9</sup> In particular, the DSPs contained within the GATT and the WTO explicitly limit participation to member governments.

<sup>10</sup> The most notable regional trading arrangements providing private parties with legal standing for the purposes of dispute settlement consist of the European Union (EU) and the North American Free Trade Association (NAFTA).

higher the probability that the political climate proves favorable, the greater the governments' willingness to participate in the accord. Nevertheless, Levy and Srinivasan conclude that enabling private parties to instigate formal trade disputes ultimately limits the incidence, as well as the scope, of international trade agreements. Thus, the form, in addition to the mere existence, of the DSPs matters in terms of affecting countries' ability to liberalize trade.

### **Notable Recent Contributions to the Literature**

Ludema (2002) focuses on dispute-settlement procedures as a mechanism that, in the event one of the parties deviates from an initial agreement, permits governments to renegotiate tariff levels with the aim of attaining a newly-efficient outcome. In framing his analysis, Ludema criticizes the approach of previous papers in which Nash-reversion strategies represent the preferred method of retaliation in response to violations of the cooperative equilibrium. Given that the trigger strategies inflict costs on compliant, as well as deviant, countries, Ludema questions countries' willingness to submit to such an outcome in the event of a dispute. In fact, he claims that, faced with the prospect of Nash reversion, countries possess a powerful incentive simply to renegotiate the terms of the initial accord. To that end, he envisions dispute-settlement procedures as a forum for renegotiation among the parties to an international agreement. Using an infinitely-repeated, tariff-setting game involving two countries and two goods, the paper examines the degree of liberalization achieved in accords that initially exclude and eventually include a dispute-settlement mechanism.

In the absence of dispute-settlement procedures, countries lack the ability to communicate after concluding an accord. The paper notes that, in such instances, the harshest, credible form of retaliation consists of an infinite reversion to autarky. On account of the severity of the punishment path, countries actually succeed in reducing tariffs to the lowest level imaginable. In other words, a free-trade equilibrium exists. In contrast, allowing countries to remain in contact after an agreement enters into force meaningfully affects the degree of liberalization that governments achieve. Ludema views DSPs, which identify the outcome that follows a deviation, as embodying three fundamental principles: conciliation, reciprocity and consistency<sup>11</sup>. Assuming that a dispute-settlement mechanism

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<sup>11</sup> Ludema interprets the three concepts as follows. "Reciprocity" reflects the assumption that the punishment path generates equal welfare levels for the two countries. "Consistency" signifies that the countries specify the same retaliatory strategy, regardless of whether the dispute concerns a violation of the initial cooperative equilibrium or a previous punishment path. Finally, "conciliation" refers to the fact that neither country prefers an alternative punishment path satisfying the preceding conditions.

exhibits such characteristics, agreements become “renegotiation-proof.” In other words, no disputes occur in equilibrium.

Yet, a trade-off exists between the frequency with which disputes arise and the magnitude of the prevailing tariff reductions. Therefore, despite the fact that cooperative equilibria still exist, free trade no longer proves attainable—a development that unequivocally reduces the welfare afforded to both countries by a negotiated accord. More specifically, providing countries with opportunities for renegotiation hinders the capacity of certain discount factors to facilitate cooperation. In general, the greater the value that countries place on future payoffs, the lesser the incentive to deviate in the immediate period. As a result, the costs imposed by a protracted punishment period far outweigh the benefits derived from a one-period violation—an imbalance that provides a catalyst for deep tariff cuts in the absence of dispute-settlement. If, however, renegotiation allows countries to agree to an alternative, diminished form of punishment in the event that a dispute occurs, then deviation represents a less expensive and, at the same time more appealing, proposition. Thus, Ludema, to a certain extent, finds that dispute-settlement procedures constrain trade liberalization.

The focus on renegotiation-proof equilibria<sup>12</sup> constitutes perhaps the paper’s most glaring weakness. Given the volume of dispute-settlement cases launched in the GATT and the WTO, the model’s inability to generate trade disputes in equilibrium suggests an absence of economic realism. The equilibrium concept used in the paper reflects the belief that countries never will commit to an agreement that governments will find optimal to renegotiate in a subsequent period. That notion’s shortcoming in the present context lies in the implicit assumption that, in the initial negotiations, countries always foresee the need to adjust the contents of an accord at some point in the future. If truly endowed with perfect foresight, then perhaps countries will design an accord that addresses all anticipated contingencies, assuming that a complete contract also proves cost-effective. However, in reality, countries lack the capacity to predict the future with total accuracy. Therefore, violations of agreements typically arise as countries respond to unexpected shifts in economic conditions.

Bown (2002a) envisions dispute-settlement as fulfilling substantive objectives that extend beyond rule integrity to encompass conciliation and negotiation. The paper contends that DSPs play a crucial role in shaping the manner in which countries restore efficient outcomes in the aftermath

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<sup>12</sup> In reference to renegotiation-proof equilibria, Myerson (1991) offers the following comments: “We should not expect that intelligent players at the beginning of the game could persuade themselves, through some negotiation process, to focus on playing one equilibrium if, at some later stage in the game, a similar negotiation process would lead them to focus on some different equilibrium. The players should not be able to negotiate to an equilibrium that would be renegotiated later.”

of random disturbances. Bown evaluates his conjecture using a model comprised of two countries and two goods produced by firms operating in perfectly-competitive markets. Each government possesses a single trade-policy instrument—import tariffs. Perhaps most importantly, along the lines of Grossman and Helpman (1994)<sup>13</sup>, Bown’s model incorporates political-economy influences<sup>14</sup>. As a result, governments maximize aggregate welfare functions defined as a “politically-weighted” sum of producer surplus, consumer surplus and tariff revenue. In the process, governments attach added weight to the profits earned by import-competing industries. Consequently, the relative magnitudes of the governments’ weights, also known as the “political-economy parameters,” play a key role in determining the degree of liberalization attainable in bilateral negotiations.

More specifically, countries achieve an efficient trade agreement by setting tariffs at the levels that maximize joint welfare. Assuming that an initial, efficient trade agreement already exists, Bown subjects the Home country to a shock that alters the size of the political-economy parameter. The shocks include all events that change the government’s political leanings, such as a national election. More importantly, however, despite leaving Foreign welfare unchanged, the shock reduces Home welfare and provides Home officials with an efficiency-based justification for adjusting tariffs. At that point, the question arises as to the method utilized by the Home government when abandoning the initial accord.

The “legal” path to protection requires that a country adhere to the rules specified by the safeguards provisions contained in GATT Articles XIX and XXVIII. Thus, the Home country sets tariffs at the newly-efficient level and immediately informs the Foreign government, as well as the WTO. The WTO allows the Foreign government to seek compensation through the withdrawal of “substantially-equivalent” concessions<sup>15</sup>. Thus, foreign tariffs rise by an amount necessary to fully offset the terms-of-trade movement produced by the Home country’s tariff adjustment. Perhaps not surprisingly, the fact that the safeguards measures limit the acceptable degree of Foreign retaliation entails important consequences for the Home country’s protection-implementing decision. On the

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<sup>13</sup> Grossman and Helpman claim that, instead of maximizing national welfare, government officials maximize a public welfare function that depends on the volume of political contributions collected and the welfare of a representative voter. At the same time, each lobby makes campaign contributions in an attempt to steer the government’s trade policy in a direction that suits the particular group’s interests. Thus, the government’s degree of support for trade liberalization reflects the relative strength of protectionist forces in the country.

<sup>14</sup> Bagwell and Staiger (2001) and Schwartz and Sykes (2002) also acknowledge the importance of political-economy influences in shaping government policy in the area of international trade.

<sup>15</sup> Bagwell and Staiger (1999) provides an extensive discussion of “reciprocity” as the concept applies to GATT and WTO proceedings. The notion of reciprocity conveyed in the paper forms that basis for Bown’s interpretation of permissible levels of retaliation under the GATT and WTO’s safeguards provisions.

other hand, “illegal” protection, which faces automatic and immediate detection, induces a markedly different approach to retaliation. In particular, Bown interprets GATT Article XXIII as applying no explicit constraints on the Foreign country’s retaliatory response. As a result, the paper assumes that the Foreign government simply imposes Nash tariffs. Most importantly, faced with the prospect of such a severe punishment, the Home government’s illegal protection also involves Nash reversion.

In general, Bown finds that, if the Home country’s political-economy parameter exceeds that of the Foreign country, then protection occurs in a legal setting. The ranking of the parameters in the legal case implies that initial tariffs occupy a relatively high level at Home and, at the same time, a relatively low level overseas. Hence, Home consumers buy relatively few Foreign-produced items, while Home firms sell a relatively large volume of goods abroad. Thus, by using legal protection, the Home government avoids exposing domestic firms to extensive losses, as the Foreign use of Nash tariffs unleashes a dramatic shift in the terms of trade. In contrast, in cases where protection follows an illegal route, the relative magnitudes of the parameters imply fairly robust pre-shock imports in the Home country—a fact that leaves the Home government well-placed to inflict harm on Foreign producers, yet limits the extent to which Home firms from suffer due to a decline in Foreign market share.

The paper concludes by assessing the qualitative effects of the reforms that accompanied the WTO’s formation. Most notably, the WTO amends Article XXIII to restrict retaliatory responses in cases of illegal protection to levels that simply nullify the injury attributed to the initial violation. As a result, retaliation, limited to the withdrawal of “substantially-equivalent” concessions, mirrors that allowed under the safeguards provisions. After adapting the model to the reforms, Bown finds that, irrespective of the relative magnitudes of the political-economy parameters, the Home government implements protection illegally in all cases. The reforms clearly weaken the threat facing countries that act illegally—which proves particularly important in cases where Home firms depend heavily on Foreign sales and appear the most vulnerable to Foreign tariff hikes. In an attempt to offset the reforms making illegal protection increasingly attractive, the WTO agreement also modifies the rules governing retaliation under Articles XIX and XXVIII. More specifically, the agreement prevents an affected country from seeking compensation under the safeguards provisions until three years after the date marking the initial violation. Nevertheless, Bown concludes that, on balance, the two sets of reforms make illegal, as opposed to legal, forms of protection more lucrative and, accordingly, more prevalent.

Bown deserves praise for systematically examining an alternative role for dispute-settlement. The paper not only suggests that dispute-settlement enhances the functioning of the international trading system in ways apart from promoting rule integrity, but also displays a concerted effort to capture conciliation and negotiation in a theoretical framework. In addition, the model adopts a more realistic approach in identifying the factors motivating government actions in the trade-policy sphere. The premise that governments behave in a not-altogether altruistic fashion appears well-founded. Finally, the model allows for the possibility of trade disputes in equilibrium. A number of papers, such as Ludema (2002), develop models that never generate deviations from the cooperative equilibrium—a rather unrealistic outcome given the multitude of cases filed following the WTO’s inception.

On the other hand, Bown’s paper displays various shortcomings. First, and most notably, the nature of the random shock seems somewhat dissatisfactory. Bown limits the size of the shock, in order to prevent “preference reversals<sup>16</sup>.” His approach, while logical from the standpoint of a desire to maintain simplicity, prevents efforts to examine potentially-interesting cases where, for example, relatively-objective governments suddenly adopt a highly-politicized stance. Such dramatic swings in attitude seem especially likely in developing countries. Moreover, the model only permits political shocks to affect government behavior. Introducing economic shocks into the model, for instance, creates chances to assess whether government actions vary, according to the nature of a disturbance. Perhaps responding to shocks to the real economy enjoys a greater degree of perceived legitimacy than implementing protectionist measures to appease various political factions. If combined with an element of uncertainty, then such an extension appears particularly promising, given the findings in Hungerford (1991)<sup>17</sup>.

Another source of dissatisfaction stems from the exogenous determination of the political-economy parameter. The parameter assumes a significant role in shaping the extent of liberalization attainable in the cooperative equilibrium and in determining governments’ responses to the political-economy shocks. Thus, endogenizing the parameter by permitting industries to behave optimally in

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<sup>16</sup> More specifically, Bown assumes that no difference between the pre-shock and post-shock orderings of the two countries’ political-economy parameters exists. Suppose, for example, that the Home government places less pre-shock weight on the welfare of import-competing firms than the Foreign government. Even in cases where the shock boosts the size of the Home government’s parameter, the Home parameter will not rise to a level above that occupied by the Foreign parameter.

<sup>17</sup> The paper noted that, if countries prove unable to distinguish terms-of-trade movements due to economic shocks from fluctuations due to protectionist use of non-tariff barriers, then cooperation proves more difficult to maintain.

choosing output levels and lobbying government officials represents yet another way to enrich the model. Somewhat relatedly, Bown presumes that both countries possess perfect information. The Foreign government, for example, observes the initial value of the Home government's political-economy parameter, as well as the magnitude of the shock. If, instead, Foreign officials prove unable to perceive such measures with complete accuracy, then enforcement faces additional challenges and the tariff reductions that countries adopt become limited. A major difficulty associated with injecting uncertainty into the model, however, consists of identifying a reliable signal that the countries use to form rational expectations of trading partners' political-economy parameters.

Finally, the model's treatment of retaliation engenders a bit of skepticism. Like most authors, Bown provides for automatic and immediate detection of all violations of existing agreements. In contrast, if discovery transpires at a point in the future, or perhaps not at all, then deviation holds an even greater attraction for governments. Imperfect monitoring raises the benefits and reduces the costs of implementing illegal forms of protection. Moreover, in cases involving illegal protection, the country affected by the violation imposes Nash tariffs in the same period in which detection occurs. Lags exist between neither deviation and detection nor detection and retaliation. Essentially, the model's purely static. At the same time, in cases involving legal forms of protection, the injured party always relies on reciprocity-consistent methods of punishment.

Finally, in negotiating a return to an efficient outcome, the countries, according to the paper, wield equal bargaining power. Introducing power imbalances presents another opportunity to enhance the model's realism. In particular, unleveling the playing field suggests an appropriate means of analyzing disputes between developed and developing countries, as well as considering if, and how, the resolution of such disputes differs from the resolution of disputes between trading partners with equal stature. Nonetheless, in spite of the criticisms proffered in the preceding paragraphs, Bown's model constitutes perhaps the most suitable candidate for extension, as discussed in the closing portions of the present paper.

Bown (2002b), utilizing the analytical framework presented in the preceding paper, performs an empirical investigation into the factors motivating a country's decision to erect barriers to trade, as well as the government's subsequent choice of whether or not to violate international obligations in a legally-approved manner. To that end, Bown investigates the episodes of legal and illegal import

protection that occurred in the 22-year period between 1973 and 1994<sup>18</sup>. While four-digit, SITC data distinguishes the industries involved, the paper employs three alternative methods of identifying the trading partners materially affected by protectionist measures: first, any country that supplies at least ten percent of the imports subject to restriction; second, the country that receives the largest share of the deviating country's exports; and lastly, the country that accounts for the greatest share of the deviating country's imports of the protected good<sup>19</sup>.

With respect to the government's first-stage decision, Bown observes that, as average tariff levels rise, import growth rates accelerate and export volumes decline, countries appear increasingly inclined to implement protectionist measures. The results seem logical, since brisk import expansion implies a growing ability to inflict losses on foreign producers, while shrinking export volumes point to reduced vulnerability to retaliation. With respect to the government's second-stage decision, in light of the fact that the import variables lack statistical significance<sup>20</sup>, the estimation offers little evidence that a desire to manipulate the terms of trade exerts a substantial influence on the choice between legal and illegal forms of protection.

Nevertheless, the data support Bown's other assertion that, in deciding which protectionist path to pursue, countries pay particularly close attention to the affected trading partner's capacity to inflict economic damage through retaliation. A trading partner wields a significant capacity to injure, whenever that country either represents an especially lucrative market for the protectionist country's exports or exhibits minimal dependence on the protectionist country's consumers as a source of demand. In the confines of such bilateral relationships, countries impose legal forms of protection to ensure that retaliation occurs under the safeguards mechanism, which limits punishment to a withdrawal of equivalent concessions. When a trading partner occupies a "weak" position, however, countries disregard notions of legality and display little concern for the unlimited retaliation permitted by the DSPs<sup>21</sup>. Perhaps most notably, Bown concludes that DSPs fail to deter countries

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<sup>18</sup> "Legal" protection falls under the jurisdiction of the safeguards measures contained in Articles XIX and XXVIII of the GATT. The dispute-settlement provisions of Article XXIII cover cases of "illegal" protection. Bown's data set consists of 147 episodes of legal and 98 instances of illegal protection.

<sup>19</sup> Bown refers to the countries identified according to the second and third definitions as the "most powerful" and the "most affected" trading partners, respectively.

<sup>20</sup> In spite of the fact that the estimated coefficients possess the appropriate signs, neither the volume of real imports nor the ratio of the protectionist country's imports to the affected country's total exports meet the criteria for statistical significance.

<sup>21</sup> Recall that Bown's dataset encompasses the period prior to the WTO's formation and the extension of the principle of reciprocity to retaliation implemented under the auspices of the DSP.

from inflicting illegal protection on relatively weak trading partners—a finding that echoes Maggi’s earlier analytical results.

### **Avenues for Future Research**

Questions naturally arise as to the degree to which existing analytical models offer a realistic portrayal of international trade relations and capture the salient features of dispute-settlement within the WTO. Despite recent efforts to broaden and enrich the theoretical analysis of dispute-settlement mechanisms, the existing literature displays a few prominent gaps that warrant attention. First, most authors examine the role of dispute-settlement in liberalizing trade in goods produced and sold in perfectly-competitive markets. Injecting imperfect competition into the analysis raises an interesting set of issues. Papers by Grossman and Helpman (1994), Bagwell and Staiger (2001), Schwartz and Sykes (2002) and Bown (2002a and b) contend that domestic political considerations motivate tariff-setting on the part of national governments. Given the highly-concentrated nature of imperfectly-competitive markets, firms in such industries face fewer collective-action problems when attempting to lobby the government. Thus, imperfectly-competitive industries likely exert a powerful influence on the decision-making process in relevant areas. Moreover, such industries face strong incentives to protect market share at home and steal market share abroad.

Second, apart from Maggi (1999), few authors consider the impact of dispute-settlement procedures on tariff-setting games involving more than simply a pair of countries.<sup>22</sup> Expanding the number of countries creates opportunities to investigate further the suggestion that the qualitative effects of various aspects of dispute-settlement differ, depending on whether the process operates in a multilateral or a bilateral setting. At the same time, widening models to incorporate  $n$  countries permits an assessment of the economic conditions underlying a government’s decision to negotiate either a bilateral, a “regional” or a “global” agreement. In addition, if a shock occurs, then the government’s preference regarding the “size” of the optimal accord potentially changes, making shifting coalitions a distinct possibility.

Third, most models assume that countries possess symmetric bargaining power. In reality, power imbalances pervade a number of trading relationships, especially when the exchanges involve developed and developing countries, as noted by Hoekman and Mavroidis (2000). Uneveled playing

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<sup>22</sup> Maggi’s three-country model represents one of the few attempts to expand analysis of dispute-settlement procedures beyond the basic two-country framework.

fields stem, in part, from gaps in the relative sizes of the countries' economies—gaps that reduce the credibility of developing-country retaliatory threats. Specifically, the fact that, in most developing countries, domestic demand remains relatively modest restricts the governments' capacities to seek compensation from developed-country firms through the use of retaliatory tariffs. Given that each developing country probably accounts for only a minute portion of such firms' total sales, a loss of market share in a single developing economy hardly seems capable of inflicting significant damages on such firms. Meanwhile, issue linkages suggest another source of power imbalances. Most developing countries depend on the different forms of aid provided by developed countries to finance various projects. Perhaps, in certain instances, developing countries refrain from filing trade disputes against donor governments, in order to avoid a termination of the assistance programs.

Fourth, few papers acknowledge that, for countries injured by the protectionist measures, initiating a formal trade dispute entails explicit monetary costs. In order to present a convincing case, an affected country needs to gather extensive economic data documenting the damage allegedly inflicted by a trading partner's illegal policy. In addition, the government requires a legal team with detailed knowledge of, and experience in dealing with, the international trading system. In general, collecting statistics and employing legal experts implies that filing a dispute entails significant expenditures. Moreover, suppose that an injured country obtains a favorable ruling from the dispute-settlement panel. Article XXIII only permits the country to seek appropriate compensation for the economic costs incurred due to the illegal policy. The country receives no reimbursement for the costs of pursuing the dispute. Thus, prior to entering the dispute-settlement process, a country needs to weight the benefits of compensation against the monetary costs of administering the case. Hoekman and Mavroidis (2000)<sup>23</sup> emphasize that such expenditures prove particularly burdensome for cash-strapped, developing countries—a fact that likely limits the number of cases that such countries initiate.

Finally, apart from Hungerford (1991) and Riezman (1991), all of the aforementioned papers portray countries as fully informed about each other's implementation of protectionist measures. By endowing countries with complete information, the authors essentially guarantee perfect monitoring of compliance with international accords. Governments, therefore, automatically and immediately detect all violations of existing agreements. Assuming that perfect information exists appears highly impractical in several respects. Even in cases involving tariffs, generally considered among the most

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<sup>23</sup> Bown (2002a) notes the importance of investigating the effects of costly dispute-settlement on countries' decisions to seek compensation when harmed by violations of trade agreements.

transparent policy tools, foreign firms in targeted sectors require a certain amount of time to gauge the impact of an increase on product demand. Moreover, as Hungerford finds, non-tariff barriers pose an even greater challenge to monitors. Foreign countries not only encounter serious obstacles in estimating the effects of a non-tariff policy adjustment, but also in discerning that such a change actually occurred in the first place. In fact, the opaque nature of non-tariffs barriers accounts for a sizable portion of the attraction that such measures hold for national governments. Thus, as countries increasingly rely on non-tariff forms of protection, the likelihood of evading detection rises, and the expected costs of deviation fall. In general, the speed and accuracy with which countries uncover violations depends on the resources, financial as well as human, that governments expend on such activities. According to Hoekman and Mavroidis (2000), given that developing countries confront particularly severe resource constraints, violations against such countries appear particularly likely to pass unnoticed.

Relatedly, and perhaps most importantly, nearly all of the existing models presume that no time lag exists between deviation, detection and retaliation. In other words, retaliatory measures take effect in the same period as the initial violation. Such an assumption seems incredibly unrealistic. In actuality, the dispute-settlement process potentially proves quite prolonged. The WTO, for example, allows the opening stage, in which countries attempt to resolve outstanding issues without resorting to a panel ruling, to continue for 60 days. The entire process spans either a year, or fifteen months, depending on whether one of the parties repeals the panel's ruling. Meanwhile, even more protracted delays occur under the safeguards provisions. Hoekman and Mavroidis (2000), Anderson (2002), Bown (2002a) and Schwartz and Sykes (2002) highlight that the modified versions of Articles XIX and XXVIII grant all violators a "reasonable" period of time, typically three years, to return to full compliance. The Articles authorize compensation in the event that the violating country fails to abide by the ruling. That said, however, the safeguards provisions only permit an affected country to seek compensation for damages suffered after the "grace period." Thus, countries found in legal breach of the agreement enjoy the prospect of three years of violation without retaliation. Clearly, the longer the lag between imposing protection and paying compensation, the greater the incentive to deviate.

## **Concluding Remarks**

Most economists count the introduction of a formal mechanism for settling disputes among the institutional features of the GATT and the WTO with the most far-reaching implications for the nature of international trade relations. Yet, while most economists appear in broad agreement with respect to the significance attached to dispute-settlement procedures, a similar consensus clearly fails to exist regarding the underlying reason for that importance. In particular, economists envision the dispute-settlement process as, alternatively: trigger strategies designed to enforce a set of cooperative equilibria; means of gathering crucial information about government compliance with international accords; mechanisms for inspiring in countries a deep sense of belonging to the international trading community; procedures for renegotiation in the aftermath of violations; or, in several cases, a combination of several of the aforementioned roles. The increasing complexity and sophistication of recent analyses notwithstanding, a number of key features associated with DSPs in practice still await integration into theoretical models. Moreover, the latest series of reforms of the Dispute-Settlement Understanding (DSU), scheduled for May 2003, likely not only will guarantee that dispute-settlement remains prominently placed on the WTO agenda, but also will suggest additional paths for future research.

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