



ANNUAL REVIEWS **Further**

Click [here](#) for quick links to Annual Reviews content online, including:

- Other articles in this volume
- Top cited articles
- Top downloaded articles
- Our comprehensive search

# The World Trade Organization: Theory and Practice

Kyle Bagwell and Robert W. Staiger

Department of Economics, Stanford University, Stanford, California 94305, and NBER; email: [kbagwell@stanford.edu](mailto:kbagwell@stanford.edu), [rstaiger@stanford.edu](mailto:rstaiger@stanford.edu)

Annu. Rev. Econ. 2010. 2:223–56

First published online as a Review in Advance on March 8, 2010

The *Annual Review of Economics* is online at [econ.annualreviews.org](http://econ.annualreviews.org)

This article's doi:  
10.1146/annurev.economics.102308.124500

Copyright © 2010 by Annual Reviews.  
All rights reserved

1941-1383/10/0904-0223\$20.00

## Key Words

WTO, GATT, trade agreements, terms-of-trade theory

## Abstract

We consider the purpose and design of the World Trade Organization (WTO) and its predecessor, the General Agreement on Tariffs and Trade (GATT), and review recent developments in the relevant theoretical and empirical literature. We describe the GATT/WTO architecture and briefly trace its historical antecedents. We suggest that the existing literature provides a useful framework for understanding and interpreting central features of the design and practice of the GATT/WTO, and we identify key unresolved issues.

## 1. INTRODUCTION

As a subject for study by economists, the World Trade Organization (WTO) and its predecessor, the General Agreement on Tariffs and Trade (GATT), exhibit a number of interesting and attractive features.<sup>1</sup> First, the GATT/WTO is widely acknowledged to be one of the most successful international institutions ever created: On this basis alone it is important to understand the reasons for its success. Second, although it is a multilateral institution, the GATT/WTO has adopted a bilateral approach to multilateral bargaining, according to which reciprocal negotiations (over tariffs) occur on a voluntary basis through time between pairs of countries or among small numbers of countries, with the results of these bilateral negotiations then multilateralized to the full GATT/WTO membership by a nondiscrimination requirement that tariffs abide by the most-favored nation (MFN) principle. This approach is distinctive among multilateral institutions, raising the question of whether it can help account for the success of the GATT/WTO as a negotiating forum; it has also left in its wake a wealth of bargaining data, extending back to the creation of the GATT in 1947, the analysis of which could yield important insights for bargaining theory. Third, although commitments negotiated within the GATT/WTO must be self-enforcing to be effective, much like the collusive agreements among firms that have been the subject of a large literature in industrial organization, the GATT/WTO contains its own explicit enforcement/dispute settlement procedure and associated case-law history, the study of which can yield insights into the nature of self-enforcing agreements. Fourth, although the GATT/WTO has in effect served as the constitution of the postwar international trading system, it is a highly incomplete contract, and understanding the nature of this incompleteness is an important task for which many of the lessons from contract theory may be relevant. Finally, most trade-policy decisions that governments face today arise in the context of a variety of international commitments that must be considered; hence, the study of commercial policy in international trade has in effect become the study of trade agreements, in which the GATT/WTO plays a central role.

In this review we describe how recent economic research attempts to understand and interpret the design and practice of the GATT/WTO. We survey both theoretical developments and related empirical work. Our review proceeds in four broad steps.

First, we survey the existing theories of trade agreements. We organize our discussion here around a simple but fundamental question: What is the problem that a trade agreement might solve? The literature identifies two possibilities: Governments may view trade agreements as helping them avoid beggar-my-neighbor policies that are unilaterally attractive but mutually destructive, or governments may view trade agreements as helping them avoid beggar-myself policies that, although not serving a government's own *ex ante* objectives, are nevertheless attractive to the government *ex post* at the time when it chooses its trade policies. The latter possibility has been formalized in the literature, and it has been suggested that trade agreements may indeed play this role. But it is the first possibility—that trade agreements help governments avoid beggar-my-neighbor trade policies—that is embodied in the theoretical attempts to understand and interpret the key design features of

---

<sup>1</sup>The GATT was created in 1947, whereas the WTO came into existence on January 1, 1995, as a result of the Marrakesh Agreement of April 1994, also known as the WTO Agreement. The GATT continues to exist as a substantive agreement within the WTO Agreement, but the WTO Agreement also includes a set of additional agreements that build on and extend GATT principles to new areas. Hoekman & Kostecki (2001) provide an excellent institutional overview of the GATT and the WTO.

the GATT/WTO. Therefore, it is this possibility that makes up the primary focus of our survey. Strikingly, as we describe below, in a wide variety of formal settings, the beggar-my-neighbor trade policies that give rise to the need for a trade agreement are driven by a single underlying motivation: terms-of-trade manipulation.

The essential insight that terms-of-trade manipulation can give rise to a problem that a trade agreement might solve dates back to Mill (1844) and Torrens (1844), and the first formal treatment of the idea was provided by Johnson (1953–1954). But terms-of-trade manipulation is often dismissed as an empirically irrelevant possibility (e.g., see Krugman 1997, Regan 2006). Given the central role that terms-of-trade manipulation is now understood to play in theories of trade agreements, it is therefore important to revisit the empirical evidence on this basic question. This is the second step of our review. Here we survey the growing body of empirical literature and suggest that the empirical relevance of terms-of-trade manipulation is much greater than has been widely believed.

In the third step of our review, we describe the GATT/WTO architecture and briefly trace its historical antecedents. We suggest that the design of the GATT reflects lessons learned from the successes and failures experienced over decades of European and U.S. tariff bargaining.

This sets the stage for our fourth and final step, in which we draw on the recent theoretical and empirical literature to interpret the design and practice of the GATT/WTO. Our discussion highlights three of the most central features of the GATT/WTO: reciprocity, nondiscrimination, and enforcement/dispute settlement.

## 2. WHAT IS THE PURPOSE OF A TRADE AGREEMENT?

All theories of trade agreements must identify a reason why negotiating governments can gain from the agreement. This involves identifying a problem that would arise absent an agreement, when governments make noncooperative trade-policy choices. The purpose of the agreement can then be viewed as providing a solution to the problem, and the negotiating governments may share in the associated benefits. It is not just confirming the existence of a problem that is important: A clear understanding of the problem and its structure can also provide important guidance for the design of an institution that can most effectively aid governments in their efforts to find a solution.

One branch of the literature posits that important international externalities arise when governments make trade-policy choices and that the purpose of a trade agreement is then to internalize these externalities. We survey this approach in Section 2.1. The other branch of the literature posits that governments face important commitment problems with regard to the private sector when they make trade-policy choices and that the purpose of a trade agreement is then to serve as an external commitment device that can tie the hands of its members. We briefly survey this approach in Section 2.2.

### 2.1. Addressing Beggar-My-Neighbor Policies

When a government pursues a beggar-my-neighbor policy, a portion of the benefits that it perceives from the policy comes at the expense of other countries. This describes an international externality associated with the government's policy choice. But what form does the international externality take?

To answer this question, we start with a setting in which markets are perfectly competitive, we describe and interpret the terms-of-trade externality that can arise, and we show that the realistic possibility that governments pursue political/distributional objectives does not introduce additional international externalities. In so doing, we present the central insights from the terms-of-trade theory of trade agreements. We then allow the possibility that markets are not perfectly competitive, we describe the new international externalities that can arise in this alternative setting, and we consider the possibility that these new externalities might give rise to alternative theories of trade agreements.

**2.1.1. Terms-of-trade externalities.** In the benchmark setting of perfectly competitive markets, a famous result holds that unilateral free trade is optimal, when a government maximizes national income and presides over a small country.<sup>2</sup> For an economist seeking to understand the GATT/WTO, this result is initially discouraging, as in these circumstances governments have no reason to pursue reciprocal tariff liberalization through GATT/WTO negotiations. Nevertheless, the result is instructive. It suggests that a trade agreement might solve a problem that arises because governments have political objectives and/or preside over large countries.

Clearly, real-world governments have political motivations and are interested not just in the size of national income, but also in its distribution. Moreover, the optimal unilateral policy for a politically motivated government may not be free trade. But this is not the same as saying that political considerations represent a problem that governments might use a trade agreement to solve. Indeed, as we discuss below, in the leading political-economy models of trade policy, governments of small countries do not gain from a trade agreement among themselves; thus, in these models, politics alone cannot explain the appeal of a trade agreement.

What if governments preside over large countries? As we observed in Section 1, that governments of large countries may succumb to the temptation to engage in terms-of-trade manipulation and thus gain from a trade agreement is not a new insight. Many trade economists, however, have objected to using this theory to explain actual trade agreements. In part these objections are empirical, and we survey the evidence in Section 3. However, in part these objections are rooted in the way that the terms-of-trade theory has been traditionally developed. One objection is that the important political constraints under which real-world governments operate are omitted from the theory. A second objection is that the theory does not capture the way that actual governments think. The terms of trade are rarely mentioned in actual trade-policy debates, for example. We argue below, however, that these objections are less damaging for the terms-of-trade theory than they might initially appear. The theory can be generalized to include political objectives, and it also may be understood in terms of the market-access language that arises in trade-policy debates.

To develop these points, we first review the textbook two-good general-equilibrium model of trade between two countries. We next define a general family of government preferences. Using this framework, we then characterize and interpret the problem that a trade agreement can solve.

<sup>2</sup>We abstract from domestic distortions for the purposes of this discussion, although the main points of this section carry over to the case of perfectly competitive markets in which domestic distortions are present (see Bagwell & Staiger 2001a).

**The model.** Two countries, domestic and foreign, trade two goods that are normal in consumption and produced in perfectly competitive markets under conditions of increasing opportunity costs. (Henceforth, we distinguish foreign variables from domestic by placing an asterisk on the former.) We let  $x$  ( $y$ ) denote the natural import good of the domestic (foreign) country. The local relative price facing domestic (foreign) producers and consumers is defined as  $p \equiv p_x/p_y$  ( $p^* \equiv p_x^*/p_y^*$ ). We assume that tariffs are nonprohibitive and represent the domestic (foreign) ad valorem import tariff as  $t$  ( $t^*$ ). Letting  $\tau \equiv (1 + t)$  and  $\tau^* \equiv (1 + t^*)$ , we then have that  $p = \tau p^w \equiv p(\tau, p^w)$  and  $p^* = p^w/\tau^* \equiv p^*(\tau^*, p^w)$ , where  $p^w \equiv p_x^*/p_y$  is the world (i.e., untaxed) relative price. [Below, we simplify notation and use  $p$  to denote the function  $p(\tau, p^w)$  and  $p^*$  to denote the function  $p^*(\tau^*, p^w)$ .]  $p^w$  is the foreign terms of trade, and thus  $1/p^w$  is the domestic terms of trade. We interpret  $\tau > 1$  as an import tax and similarly for  $\tau^*$ .<sup>3</sup>

In each country, production levels for  $x$  and  $y$  are determined by the local relative price. Domestic and foreign production functions may then be written as  $Q_i = Q_i(p)$  and  $Q_i^* = Q_i^*(p^*)$  for  $i = \{x, y\}$ . National consumption is a function of local and world prices,  $C_i(p, p^w)$  and  $C_i^*(p^*, p^w)$  for  $i = \{x, y\}$ : The local relative price defines the trade-off faced by consumers, and it also determines the level and distribution of factor income; together with the local price, the world price determines tariff revenue (which is distributed lump sum to consumers). Imports of  $x$  and exports of  $y$  for the domestic country are then defined by  $M_x(p, p^w) \equiv C_x(p, p^w) - Q_x(p)$  and  $E_y(p, p^w) \equiv Q_y(p) - C_y(p, p^w)$ , respectively. For the foreign country, we similarly define imports of  $y$  and exports of  $x$  as  $M_y^*(p^*, p^w)$  and  $E_x^*(p^*, p^w)$ , respectively. For any price, domestic and foreign budget constraints are represented as

$$p^w M_x(p, p^w) = E_y(p, p^w) \tag{1}$$

and

$$M_y^*(p^*, p^w) = p^w E_x^*(p^*, p^w). \tag{2}$$

The equilibrium world price,  $\tilde{p}^w(\tau, \tau^*)$ , is determined by the requirement of market clearing for good  $y$ :

$$E_y(p(\tau, \tilde{p}^w), \tilde{p}^w) = M_y^*(p^*(\tau^*, \tilde{p}^w), \tilde{p}^w), \tag{3}$$

where we make explicit in Equation 3 the functional dependencies for local prices. Market clearing for good  $x$  is now guaranteed by Equations 1–3.

We assume that the Metzler and Lerner paradoxes are ruled out; thus we assume  $dp/d\tau > 0 > dp^*/d\tau^*$  and  $\partial \tilde{p}^w/\partial \tau < 0 < \partial \tilde{p}^w/\partial \tau^*$ . The final two inequalities indicate that each country is large: Each country can improve its terms of trade by increasing its tariff.

**Government preferences.** The traditional approach to representing government preferences is to impose the assumption that governments maximize national income [Kowalczyk & Riezman (2009) survey the traditional approach]. By contrast, in the political-economy approach, governments are motivated by distributional concerns. Here

<sup>3</sup>Lerner symmetry implies that it is immaterial whether trade taxes and subsidies are depicted as applying to the import good or rather the export good.

we follow Bagwell & Staiger (1999a, 2002b) and adopt a general approach to modeling government preferences, representing the objectives of the domestic and foreign governments with the general functions  $W(p, \tilde{p}^w)$  and  $W^*(p^*, \tilde{p}^w)$ , respectively. We thus represent welfare in terms of the prices that the tariffs induce rather than directly in terms of the tariffs themselves.

We place no restrictions on government preferences over local prices: As local prices determine the level and distribution of factor incomes, this allows us to incorporate a wide range of political motivations. In fact, we impose only one assumption on the welfare functions. We assume that, holding its local price fixed, each government experiences an improvement in its welfare when its terms of trade improve:

$$W_{\tilde{p}^w} < 0 \text{ and } W_{p^*}^* > 0. \tag{4}$$

To understand condition 4, it is helpful to consider the underlying tariff changes that could induce a change in the world price while leaving unaltered a country's local price. Consider the domestic government. If we hold fixed the foreign tariff and increase the domestic tariff, then under our assumptions the world price  $\tilde{p}^w$  falls and the local price  $p$  rises. Thus, a unilateral tariff hike gives the domestic country improved terms of trade but also changes the domestic local price. We thus cannot understand condition 4 by considering a domestic tariff change in isolation. Let us then imagine that we increase the domestic tariff and at the same time lower the foreign tariff. This change again leads to a lower world price (i.e., a terms-of-trade gain for the domestic country), but we can calibrate a change of this kind that leaves the domestic local price unaltered. The meaning of condition 4 is thus that the domestic government values the international income transfer that is implied by an increase in the domestic tariff and a decrease in the foreign tariff that together leave the domestic local price unaltered. An analogous interpretation applies for the foreign government.

The welfare functions presented here are quite general; indeed, governments maximize welfare functions of this form in both the traditional approach and in the leading political-economy approaches to trade policy. Dixit (1987), Johnson (1953–1954), Kennan & Reizman (1988), and Mayer (1981) offer important formalizations of the traditional approach. In these formalizations, governments maximize national income, and the national income of a country improves when it experiences a terms-of-trade improvement. In the political-economy literature, Mayer (1984) shows that, under a representative democracy, the government sets its trade policy to promote the interests of the median voter, whose utility can be represented as a function of this form. As Baldwin (1987) shows, other major approaches to the political economy of trade policy employ government welfare functions of this form as well (e.g., see Olson 1965, Caves 1976, Brock & Magee 1978, Feenstra & Bhagwati 1982, Findlay & Wellisz 1982, Hillman 1982). Finally, the lobbying models of Grossman & Helpman (1994, 1995) are also included in the framework presented here.

*Unilateral policies.* We consider now the unilateral policies that governments would select if they were to interact noncooperatively. Suppose, then, that each government sets its tariff policy to maximize its welfare, for any given tariff choice of its trading partner. The associated tariff reaction curves are defined implicitly by

$$W_p + \lambda W_{\tilde{p}^w} = 0 \tag{5}$$

and

$$W_{p^*}^* + \lambda^* W_{\tilde{p}^w}^* = 0, \quad (6)$$

where  $\lambda \equiv [\partial \tilde{p}^w / \partial \tau] / [dp / d\tau] < 0$  and  $\lambda^* \equiv [\partial \tilde{p}^w / \partial \tau^*] / [dp^* / d\tau^*] < 0$ . As these expressions highlight, the best-response tariff of each government strikes a balance between the effects on its welfare of the local- and world-price movements induced by its tariff choice.

To gain further insight, let us focus on the domestic government. Starting with an initial tariff pair  $(\tau, \tau^*)$ , we suppose that the domestic government unilaterally increases its tariff and thus induces a final tariff pair  $(\tau^1, \tau^*)$ . As noted above, a unilateral hike in the domestic tariff leads to a lower world price  $\tilde{p}^w$  and a higher domestic local price  $p$ . As suggested by Equation 5, however, we can disentangle this combined change in prices into separate changes in the world and domestic local prices. We do this by imagining that the movement from the initial tariff pair to the final tariff pair is taken in two steps. In the first step, we imagine raising the domestic tariff and lowering the foreign tariff, so as to preserve the domestic local price. As explained above, when tariffs are adjusted in this way, the world price falls. Suppose that we adjust tariffs in this first step until we reach the point at which the world price is reduced to the same level that it achieves at the final tariff pair  $(\tau^1, \tau^*)$ . At this point, we initiate the second step and raise the domestic and foreign tariffs in a way that preserves the world price. When we adjust tariffs in this fashion, the domestic local price rises. We adjust tariffs in this second step until we reach the final tariff pair  $(\tau^1, \tau^*)$ .

Across the two steps, we lower the foreign tariff and then raise it back to its initial level, so that the only tariff change that remains in the end is the domestic tariff hike. By breaking the movement into two steps, we can isolate the world- and local-price changes that are identified in Equation 5. In the first step, the domestic local price is unaltered, and the world price falls. The effect on domestic welfare of a change in the world price is captured in Equation 5 with the term  $W_{\tilde{p}^w}$ . The second step by contrast fixes the world price at its final level and allows the domestic local price to rise from its initial level to its final level. In Equation 5, the effect on domestic welfare of a change in the local price is captured with the term  $W_p$ . We may interpret Equation 6 for the foreign government similarly.

We now arrive at an important observation. The welfare implications of the local-price movement in the second step are domestic in nature. In particular, they reflect the trade-off for the domestic government between the costs of the induced economic distortions and the benefits of any induced political support. By contrast, the welfare implications of the world-price movement in the first step are international in nature. Specifically, they reflect the benefits to the domestic government of shifting some of the costs of its policy choice onto the foreign government. The cost shifting occurs because an improvement in the domestic country's terms of trade corresponds necessarily to a deterioration in the foreign country's terms of trade.

In a Nash equilibrium, both governments must be on their respective reaction curves, and a Nash equilibrium tariff pair  $(\tau^N, \tau^{*N})$  thus satisfies Equations 5 and 6. We take this equilibrium to represent the trade-policy decisions that governments would make if there were no trade agreement.

**Trade agreement.** Governments value a trade agreement if it leads to changes in trade policies that generate Pareto improvements for governments relative to the welfare that they experience in the Nash equilibrium. Thus, a trade agreement is potentially valuable if

and only if the Nash equilibrium is inefficient, when efficiency is measured relative to government preferences. This discussion motivates further consideration of the Nash equilibrium and its relationship to the efficiency frontier.

Three observations can be stated.<sup>4</sup> The first observation is that Nash tariffs are indeed inefficient. The second observation is that both governments can enjoy welfare gains relative to the Nash equilibrium only if each agrees to set its tariff below its Nash level. The first observation means that a mutually beneficial trade agreement is possible, whereas the second observation implies that reciprocal trade liberalization is necessary for mutual gains. These first two observations are intuitive and follow from our discussion above. When a government contemplates an increase in its unilateral tariff, it foresees an improvement in its terms of trade; thus it is in part motivated by the prospect of shifting some of the costs of the tariff hike onto its trading partner, whose terms of trade would deteriorate. The incentive to shift costs naturally leads to inefficient policies. Furthermore, the inefficiency takes a particular form: The possibility of cost shifting leads governments to set tariffs higher than is efficient. Consequently, if both governments are to benefit from a trade agreement, then each must lower its tariff below its Nash level.

As our discussion indicates, the terms-of-trade externality is one reason for the inefficiency of the Nash equilibrium. To see if it is the only reason, we consider a hypothetical world in which governments are not motivated by the terms-of-trade implications of their unilateral trade-policy choices; that is, we consider a hypothetical noncooperative setting in which  $W_{\tilde{p}^w} \equiv 0$  and  $W_{\tilde{p}^*} \equiv 0$ .<sup>5</sup> We therefore define politically optimal tariffs as any tariff pair  $(\tau^{PO}, \tau^{*PO})$  that satisfies the following two conditions:

$$W_p = 0 \text{ and } W_{p^*} = 0.$$

The key question is whether the politically optimal tariffs are efficient. If the answer is affirmative, then we may conclude that the terms-of-trade externality is the sole rationale for a trade agreement.

The third observation is that the politically optimal tariffs are indeed efficient. To see why, suppose that each government sets its trade policy at its politically optimal level. Each government then achieves its preferred local price, given the politically optimal world price. Starting at the political optimum, consider the effects of a small increase in the domestic tariff. The first effect is that the domestic local price rises by a small amount. This effect has no first-order impact on the welfare of the domestic government, however, because the domestic government initially has its preferred local price. The second effect is that the foreign local price falls by a small amount. But the foreign government also initially has its preferred local price; thus this effect has no first-order impact on the welfare of the foreign government. Finally, the third effect is that the world price falls by a small amount. This terms-of-trade change, however, cannot generate an efficiency gain because it represents a pure international transfer from the foreign government to the domestic government in the form of tariff revenue. Consequently, starting from the political optimum, a small increase in the domestic tariff cannot generate a Pareto improvement for

<sup>4</sup>Formal proofs of these observations can be found in Bagwell & Staiger (1999a, 2002b).

<sup>5</sup>Importantly, we do not assume here that governments fail to understand the terms-of-trade effects of their tariff choices. Rather, in the context of Equations 5 and 6, we allow that governments understand that  $\lambda < 0$  and  $\lambda^* < 0$ , but we now hypothesize that  $W_{\tilde{p}^w} \equiv 0$  and  $W_{\tilde{p}^*} \equiv 0$ . Our approach is to characterize the noncooperative tariffs that would be selected by governments with these hypothetical preferences and then to evaluate the efficiency of these tariffs with respect to actual government preferences.



the governments. The effects of a small increase in the foreign tariff can be analyzed similarly. Thus, once the terms-of-trade motivation is removed from the trade-policy choices of governments, an efficient outcome is achieved, and there is nothing further for a trade agreement to accomplish.

To appreciate the role of our large-country assumption, it is instructive to relax this assumption momentarily and consider an alternative setting in which politically motivated governments preside over small countries. The government of a small country would recognize that it is unable to alter the terms of trade with its trade policy; thus, in this alternative setting, the terms-of-trade motivation is automatically eliminated from the trade-policy decisions of each government. When selecting their unilateral trade policies, the governments of small countries would thus choose politically optimal tariffs; hence, their Nash policies would be efficient. In the leading political-economy models of trade policy, therefore, the governments of small countries have no reason to form a trade agreement among themselves. Our brief detour to the alternative small-country setting thus confirms the general conclusion derived above: The value of a trade agreement is attributable to the terms-of-trade externality associated with the trade-policy choices of large countries.

The politically optimal tariffs are of course not the only efficient tariffs. For example, in the special case in which governments maximize national welfare, Mayer (1981) shows that efficient tariffs satisfy  $\tau = 1/\tau^*$ . For this case, the politically optimal tariffs correspond to reciprocal free trade and thus rest on the efficiency frontier at the point  $\tau = \tau^* = 1$ .<sup>6</sup> A trade agreement enables governments to move from the inefficient Nash tariffs to some point on the contract curve, where the contract curve is that portion of the efficiency frontier on which neither government receives below-Nash welfare. The politically optimal tariffs lie on the contract curve, provided that the countries are not too asymmetric. When the politically optimal tariffs rest on the contract curve, they are focal in the sense that they remedy the terms-of-trade inefficiency in a direct way.

Summarizing, above we argue that the purpose of a trade agreement is to provide governments with an escape from a terms-of-trade-driven prisoners' dilemma. This rationale for a trade agreement requires that countries are large, so that they can alter the terms of trade with their trade policies; however, it holds whether or not governments have political/distributional objectives.

*Interpreting the terms-of-trade externality.* The discussion above confirms what is at bottom a simple idea: Governments can gain from negotiating a trade agreement, if each would otherwise attempt to shift costs onto the other and as a consequence adopt inefficient unilateral policies. Viewed in this way, the terms-of-trade externality is simply the mechanism through which such cost shifting would occur. As noted in Section 1, however, many economists are skeptical of the practical relevance of the terms-of-trade theory of trade agreements. We now acknowledge and address two of the main objections to this theory.

The first objection is that the terms-of-trade theory is traditionally advanced under the assumption that governments maximize national income, whereas real-world governments have political as well as economic objectives. In fact, this objection is already addressed

<sup>6</sup>The politically optimal tariffs generally differ from reciprocal free trade when governments have political/distributional objectives.

above. The terms-of-trade rationale for a trade agreement holds as well when governments have political motivations.

The second objection is that the theory does not reflect the way that actual governments think. The theory seems to emphasize abstract general-equilibrium reasoning that might not resonate with practical policy makers, and indeed the terms of trade as such are rarely mentioned in trade-policy debates. In response to this objection, we stress that the terms-of-trade theory also may be interpreted in ways that suggest greater practical relevance. First, although we present the theory using a general-equilibrium model above, the theory can also be developed in the context of a partial-equilibrium model. In the partial-equilibrium model, cost shifting occurs through changes in the terms of trade provided that the import tariff is not fully passed through to domestic prices. Intuitively, foreign exporters then bear some of the incidence of the tariff. In this setting, we can thus immediately understand that unilateral tariffs are inefficient because the domestic government fails to internalize the cost of lost profits that its import tariff imposes on foreign exporters.<sup>7</sup> Second, real-world trade-policy negotiations are conducted using the language of market access, and the terms-of-trade theory can easily be translated into this language. When the domestic government raises its import tariff and thereby shifts in its import demand curve, the resulting price effect under which the domestic country enjoys a terms-of-trade improvement is accompanied by a volume effect under which the foreign country experiences a reduction in access to the domestic market. Once this link between price and volume effects is forged, the terms-of-trade theory can be developed using the market-access language that trade-policy negotiators adopt (for a formal definition of market access and further development of the relationship between the terms-of-trade theory and the language of market access, see Bagwell & Staiger 2002b).

**2.1.2. Other international externalities.** Our discussion thus far proceeds from a backdrop in which markets are assumed to be perfectly competitive. The perfectly competitive paradigm offers a valuable benchmark for understanding the purpose of trade agreements, but in many markets firms possess market power. An extensive literature has established that imperfectly competitive markets can give rise to profit-shifting and firm-delocation effects that provide novel motives for unilateral trade-policy intervention (e.g., see the integrative treatment of this literature in Helpman & Krugman 1989). This suggests that other international externalities in addition to the terms-of-trade externality might arise in markets with imperfect competition, raising the possibility as well that new rationales for trade agreements beyond the terms-of-trade rationale might then be identified in these settings.

Ossa (2009) explores the role of trade agreements in imperfectly competitive environments. He considers a monopolistically competitive setting of two-way trade in similar products, in which firms produce differentiated products under conditions of free entry and compete for sales both in the home market and abroad, and in which exporting the product abroad involves shipping costs. In such an environment, Venables (1987) has shown that a firm-delocation motive for trade policy arises: If the domestic country imposes a tariff on its imports or offers a subsidy to its exports, then foreign firms can be delocated to the home market, and domestic consumers save on trade costs and enjoy a

<sup>7</sup>In Bagwell & Staiger (2001b), we employ a partial-equilibrium model, derive the three observations mentioned above, and further develop this interpretation.

lower overall price index; the domestic consumers' gain, however, comes at the expense of foreign consumers, whose price index rises. Importantly, Ossa shows that the firm-delocation effect represents a beggar-my-neighbor policy that does not travel through the terms-of-trade externality.

In terms of the representation of welfare introduced above, the novel international externality identified by Ossa (2009) takes the form of a local-price externality: In each government's welfare function, the local price in the other country enters directly, in addition to its own local price and the world prices (for a development of this representation in the firm-delocation model, see Bagwell & Staiger 2009a). Intuitively, each government now cares directly about the local price in the other country's market because each government would rather have more of the world's firms (and the production of their individual varieties) located locally than abroad to save on transport costs, and the equilibrium pattern of firm location across countries depends on local prices in both countries via the free-entry condition.

As it turns out, this local-price externality arises in other imperfectly competitive environments as well. In particular, Bagwell & Staiger (2009b) explore imperfectly competitive environments in which entry is not free and monopoly/oligopoly profits exist, and in which the well-known (Brander & Spencer 1981, 1984a,b, 1985) profit-shifting motive for trade-policy intervention arises.<sup>8</sup> Here as well, governments care directly about the local prices in the markets of their trading partners, in addition to their own local prices and the world prices. In this case, the reason is that governments care about the profits of their firms, and firm profits depend in part on the volume of export sales, which is in turn influenced by local prices in the export destination market.

Hence in the presence of imperfect competition, new international externalities can indeed arise; in addition to the terms-of-trade externality that travels through the world price, there are also local-price externalities that travel through domestic and foreign local prices when firm-delocation or profit-shifting effects are present. This implies that the international policy environment is more complex than in the case of perfectly competitive markets, and it raises the possibility that the task of a trade agreement may be more complicated in this environment as a result. To assess this possibility, however, we must ask whether governments would make unilateral policy choices that internalize these international externalities in an appropriate fashion from a worldwide perspective, whatever form these externalities might take, and if not, why not.

It is readily established and unsurprising that unilateral policy choices in this environment are indeed inefficient. After all, the terms-of-trade (world-price) externality that drives the inefficiency in the competitive setting is still present here, and now there are additional (local-price) externalities as well. But when the question of what accounts for the inefficiency is posed, as we pose this question above, and the efficiency properties of politically optimal tariffs are evaluated, a surprising answer emerges: The sole rationale for a trade agreement in this environment is again to remedy the inefficiency attributable to the terms-of-trade externality, the same rationale that arises in perfectly competitive markets. More specifically, if governments could be induced to not value the pure international rent shifting associated with the terms-of-trade movements caused by their unilateral tariff choices, then their tariff choices would be efficient and there would be

<sup>8</sup>A related exploration is contained in Bagwell & Staiger (2002b, chapter 9), although the representation of welfare as exhibiting a local-price externality is not developed there (see also the recent analysis of Mrazova 2009).

nothing left for a trade agreement to do.<sup>9</sup> Intuitively, when governments adopt politically optimal tariffs, they are not motivated to impose terms-of-trade externalities on each other, and they are thus freed to use their trade policies to achieve their preferred local prices, the achievement of which then ensures that the international externalities associated with local-price movements are eliminated (to the first order) as well.

It is worth pausing to reflect on this last point. As observed above, in the presence of imperfectly competitive markets, local-price externalities can arise; however, at the political optimum, to which governments would be led if they did not value the world-price externalities, the local-price externalities disappear and the outcome is efficient. Still, in general, these local-price externalities would be operative away from the political optimum, and they may therefore represent an important feature for a trade agreement to address, if the agreement is not designed to deliver the political optimum. For example, as Ossa's (2009) findings demonstrate, and as discussed further in Bagwell & Staiger (2009a), if governments were constrained in their use of export policies, the political optimum could not in general be reached, and in this case the local-price externalities become an important component of the problem that governments must solve in this environment. This observation takes on special relevance in the present context, as the GATT/WTO restricts the use of export subsidies. In this light, Ossa's findings can be interpreted as characterizing a problem that arises when export subsidies are banned. At the same time, this interpretation falls short of delivering a fundamental rationale for a trade agreement because it appeals to the existence of a trade agreement (on export subsidies) to explain the purpose of a trade agreement.

Finally, in both the competitive paradigm and in each of the imperfectly competitive environments discussed above, international (world) prices are determined by anonymous market-clearing conditions. However, for many international transactions, the international prices at which the associated goods or services change hands are determined as a result of bilateral bargaining between the domestic purchaser and the foreign supplier. When international prices are determined in this way, Antras & Staiger (2008) show that the mechanism by which countries shift the cost of their policy intervention on to trading partners becomes more complex, and the possibility of a novel political externality along the lines suggested by Ethier (2004) may arise and pose an independent problem for a trade agreement to solve. In light of the broad set of market structures in which beggar-my-neighbor problems can be given a terms-of-trade interpretation, the finding of a novel beggar-my-neighbor problem that can arise under certain conditions and cannot be given a terms-of-trade interpretation—and that suggests a distinct rationale for a trade agreement—is significant and warrants further attention, but the literature has not yet gone beyond the identification of this possibility.

## 2.2. Addressing Beggar-Myself Policies

Above we focus on theories of trade agreements that emphasize the control of beggar-my-neighbor motives. A distinct although possibly complementary approach to the theory of trade agreements can be developed if it is posited that the purpose of a trade agreement is to tie the hands of its member governments against private agents in the economy and

---

<sup>9</sup>This result is established for the firm-delocation model in Bagwell & Staiger (2009a) and for the profit-shifting model in Bagwell & Staiger (2009b).

thereby offer an external commitment device. This approach has been formalized in a number of papers (e.g., see Carmichael 1987; Staiger & Tabellini 1987; Matsuyama 1990; Brainard 1994; Mitra 2002; Maggi & Rodriguez-Clare 1998, 2007).<sup>10</sup> To describe the main ideas, we focus on the papers of Maggi & Rodriguez-Clare.

Maggi & Rodriguez-Clare (1998) adopt a small-country perspective so that the terms-of-trade argument for trade agreements is absent, and they focus instead on the possibility that an anticipated trade-policy-lobbying relationship between the government of this small country and producers in one of its sectors could distort the equilibrium allocation of resources in the economy toward the sector with the active lobby. Working with the lobbying model of Grossman & Helpman (1994), Maggi & Rodriguez-Clare confirm that the government will be compensated by the lobby for the ex post distortions its trade-policy choice imposes on the economy, that is, the distortions given the sectoral allocation of the economy's resources that are sunk at the time this choice is made. However, the lobby will not compensate the government for the ex ante distortions in the sectoral allocation of resources created by the anticipation of the government's relationship with the lobby, and this provides an opening for the government to wish to tie its hands ex ante against the possibility of being influenced by ex post lobbying. As Maggi & Rodriguez-Clare demonstrate, a possible commitment role for a trade agreement is thereby identified.

In Maggi & Rodriguez-Clare (1998), the possibility of lobbying ex ante (i.e., at the time that the decision to form a trade agreement is made) is not considered. In a follow-up paper, Maggi & Rodriguez-Clare (2007) allow for this possibility and develop a hybrid model that combines both terms-of-trade and commitment arguments for a trade agreement. As they demonstrate, the two motives for a trade agreement can interact in nontrivial ways and generate a number of interesting empirical predictions. For example, the magnitude of trade liberalization delivered by a trade agreement is expected to rise in the degree to which resources are mobile in and out of the sector ex post. Intuitively, when resources are mobile ex post, the lobby correctly anticipates that the rents from trade protection for its members will be low (they will be dissipated by entry into the sector), so the lobby is not willing ex ante to engage intensively against the formation of a trade agreement that commits the government to low tariffs. Maggi & Rodriguez-Clare also demonstrate that their hybrid approach can help account for the particular form (ceilings) that tariff bindings take in the GATT/WTO.<sup>11</sup>

There is some empirical evidence that commitments made in trade agreements may play this kind of role (e.g., see Staiger & Tabellini 1999, Tang & Wei 2010). Nevertheless, as noted in Section 1, although the potential commitment role of trade agreements has been identified and formalized in the literature, for the most part the literature adopting this approach has not attempted to understand and interpret the key design features of the GATT/WTO from this perspective [although Maggi & Rodriguez-Clare (2007) take an important step in this direction]. For this reason, we do not focus on theories that view the purpose of trade agreements as addressing beggar-myself policies for the remainder of our review.

---

<sup>10</sup>Regan (2006) also articulates a theory of trade agreements that seems to fit with this approach, although his theory is somewhat informal and hence more difficult to categorize with confidence.

<sup>11</sup>Using models that feature the terms-of-trade externality, Bagwell & Staiger (2005a), Bagwell (2009), and Horn et al. (2010) also provide interpretations of the use of tariff ceilings in the GATT/WTO.

### 3. TERMS-OF-TRADE MANIPULATION: THE EVIDENCE

What is the purpose of a trade agreement? As our discussion in the previous section confirms, in a wide variety of formal settings the fundamental purpose of a trade agreement is to provide an escape from a terms-of-trade-driven prisoners' dilemma. Rarely in economics do so many distinct models answer in unison a single question, and the robust structure of the problem implied by these models offers some hope that an institution with some simple design features might effectively aid governments in their efforts to find a solution. But there is also an alternative view: These models may answer in unison, but the answer they provide is simply wrong, or at least irrelevant to understanding the central features of trade agreements in general and the GATT/WTO in particular. This, of course, is an empirical issue, and in this section we survey a growing body of empirical work that provides evidence relating to the terms-of-trade argument. We focus here on papers that relate to three specific questions that we pose below and that are directly related to the essential features of the terms-of-trade argument. We postpone until Section 5 a discussion of a wider body of empirical work that relates to various predictions of the terms-of-trade theory.

A first question is whether there is evidence that a country's tariffs can affect its terms of trade, a clear precondition for the empirical relevance of the terms-of-trade theory. Studies by Kreinin (1961), Winters & Chang (2000, 2002), Anderson & Van Wincoop (2002), and Bown & Crowley (2006), among others, offer compelling evidence that unilateral tariff changes can significantly affect a country's terms of trade, even for apparently small countries such as Mexico. Moreover, recalling that the terms-of-trade effects of a tariff arise whenever the incidence of the tariff is not fully passed through to domestic prices, the large body of empirical work on exchange rate pass-through surveyed by Goldberg & Knetter (1997)—when combined with the particular empirical findings in Feenstra (1995) that the pass-through associated with exchange rate shocks can be thought of as comparable in magnitude to the pass-through associated with tariff changes—suggests that the terms-of-trade effects of tariff changes are likely to be quantitatively significant and widespread across countries. (A more complete survey of the empirical literature relating to this first question is contained in Bagwell & Staiger 2002b, chapter 11.)

A second question is whether governments respond to terms-of-trade motives in the way that the theory predicts when they set their trade policies unilaterally (and hence noncooperatively). According to a recent paper by Broda et al. (2008), the answer is yes. Focusing on 15 countries that were never GATT members, and that hence set their tariffs in a unilateral fashion prior to joining the WTO, Broda et al. first estimate the degree of market power that each of these countries was able to exert on the foreign export (world) prices that it faced (as captured by the foreign export supply elasticities faced by these countries). With these estimates, they confirm the answer to the first question posed above that other studies have also provided: Most countries, even apparently small countries, have significant ability to alter their terms of trade on many imported products with their tariff choices. Broda et al. then relate this measure of the power to affect world prices to the unilateral tariff choices that each country made over this period. They find that, prior to joining the WTO, these countries on average set tariffs 9 percentage points higher on imports for which they could exert large effects on world prices as compared with imports for which their ability to affect world prices was limited, an impact that is quite sizable (e.g., it is roughly comparable with the size of the average tariffs in these countries).

Moreover, they find that this terms-of-trade motive explains more of the cross-industry variation in tariffs than is explained by commonly used political-economy variables. Hence, according to Broda et al.'s findings, when governments set their trade policies unilaterally and noncooperatively, they respond to terms-of-trade motives strongly and in the way that the theory predicts.<sup>12</sup>

A third question is whether the tariff cuts negotiated in the GATT/WTO actually reflect the removal of that portion of the noncooperative tariff that embodies the terms-of-trade motive. One way to answer this question is to check whether measures of the power to affect world prices help predict the levels of noncooperative trade policies but do not help predict the levels of tariffs bound as a result of GATT/WTO negotiations. This is the approach taken by Broda et al. (2008). Focusing on the United States, they find that U.S. nontariff barriers and so-called statutory tariff rates—which have not been subjected to direct negotiations within the GATT/WTO—are significantly and positively related to the degree of market power that the United States exerts on the world prices of its import products, whereas the U.S. MFN tariffs—which have been the subject of GATT/WTO negotiations—exhibit no such relationship. A different approach to this question is taken by Bagwell & Staiger (2010). In that paper, the terms-of-trade theory is used to derive an expression for the component of the noncooperative tariff that embodies the international cost-shifting motive, and this expression is in turn used to predict negotiated tariff levels based on prenegotiation tariff levels, import volumes and prices, and measures of the power to affect world prices. The implied pattern of negotiated tariff cuts is then confronted with data from the accession negotiations of 16 countries that joined the WTO subsequent to its creation in 1995, and strong and robust support for the predictions of the terms-of-trade theory is found in the observed pattern of negotiated tariff concessions. When viewed together, these two papers paint a reinforcing picture of an emerging message: There is increasing evidence consistent with the view that the tariff cuts negotiated in the GATT/WTO reflect the removal of trade protection that is motivated by cost-shifting incentives, as the terms-of-trade theory predicts.

Finally, the empirical relevance of the terms-of-trade theory does not hinge on all countries being large enough to affect world prices in all products. Instead it simply suggests that the large players in the market should be the most active participants in any particular negotiation. When viewed from this perspective, the empirical pattern documented in the studies surveyed above—that most countries have the power to affect their terms of trade in some products, whereas some countries have the power to affect their terms of trade in most products—seems broadly consistent with the record of tariff bargaining in the GATT/WTO, namely, that most of the participation in tariff negotiations has come from the large industrial countries.

#### 4. THE GATT ARCHITECTURE AND ITS HISTORICAL ANTECEDENTS

The GATT arose in response to the protectionist outbreak of the 1920s and 1930s, which culminated in the U.S. Smoot-Hawley Tariff Act of 1930 and the spate of retaliatory tariffs that followed. From the perspective of our discussion above, we may think of the Nash

---

<sup>12</sup>These findings are reinforced by a recent paper of Dhingra (2009), who finds cross-country empirical support for the median-voter model of tariff determination, but only once terms-of-trade motives are taken into account.

equilibrium as corresponding to the tariff war associated with the Smoot-Hawley tariffs. The challenge that governments faced was then to find some means to reach a more cooperative trade-policy relationship and thereby move to the contract curve.

#### 4.1. Historical Antecedents

During the decade following World War I, the United States was involved in various multilateral bargaining attempts to address the problem of high and rising tariffs, each largely unsuccessful (Tasca 1938, p. 7). These repeated failures led to a conscious decision on the part of the United States to abandon multilateral tariff bargaining and experiment with bilateral bargaining under the 1934 Reciprocal Trade Agreements Act (RTAA). The RTAA marked the first time that the United States combined bilateral tariff bargaining with unconditional MFN, according to which exports from each country with whom the United States had an agreement under the RTAA would automatically receive the lowest (MFN) tariff rate that the United States offered to any exporting country.<sup>13</sup> Although this approach was novel for the United States, Europe had tried similar approaches decades earlier (Tasca 1938, p. 135), and the design and implementation of the RTAA built on lessons learned from the European experience with bilateral tariff bargaining in at least two important ways.

First, the European experience taught the important lesson that a country's current bargaining partners would require assurance that any future bilateral deals it struck with other countries would not erode the value of the concessions being granted and that the most practical way to provide assurance against such concession erosion was with a promise of unconditional MFN (Wallace 1933, p. 629). The promise of unconditional MFN was included in the RTAA in part to address the concession erosion issue.<sup>14</sup> Second, the European experience provided a vivid illustration of the perverse incentive to raise tariffs on the eve of bargaining—and thereby adopt so-called bargaining tariffs—to better position oneself for the negotiations to follow (Wallace 1933, p. 630). As Tasca (1938, p. 179, note 34) observes, this experience provided a second lesson for the United States, which for the purpose of measuring tariff concessions in its bilateral negotiations adopted the strategy of measuring all tariffs, on both sides, at a fixed prenegotiation date.

These lessons may have helped the United States avoid the twin problems associated with concession erosion and bargaining tariffs that plagued the European efforts before it and may therefore help explain why bilateral tariff bargaining under the RTAA turned out to be far more successful. But while in the European experience the issue of bargaining tariffs amounted to the unilateral positioning of prenegotiation tariffs, under the RTAA the analogous issue became how to design bilateral agreements with early negotiating partners to best preserve bargaining power for later agreements with other negotiating partners. This task was made difficult by the unconditional MFN requirement, which automatically granted other potential bargaining partners any tariff concessions granted to early negotiating partners.

---

<sup>13</sup>As Tasca (1938, pp. 116–21) describes, the United States had adopted an unconditional MFN approach since 1922, but maintained an “autonomous” (i.e., unilateral) tariff up until the RTAA.

<sup>14</sup>There were also wider arguments for adopting a policy of unconditional MFN, including the perceived multilateralization benefits and a reduction in the risk of war emphasized by U.S. Secretary of State Cordell Hull at the time (e.g., see Culbert 1987, Rhodes 1993).



The preservation of bargaining power for later negotiations became a major preoccupation of the United States under the RTAA. Beckett (1941, p. 23) and Tasca (1938, pp. 146–47) discuss the tactics used by the United States under the RTAA in this regard. In effect, it was thought that much of the free-rider potential created by unconditional MFN could be eliminated by granting tariff concessions to a negotiating partner only on those products for which the partner was the principal supplier, possibly combined with product reclassification for tariff purposes to heighten the dominance of the partner in these products, and by splitting the concession into a sequence of partial tariff reductions negotiated with different countries in successive agreements. In situations in which free riding remained a substantial possibility, two additional tactics were available: attempting to engage groups of countries in simultaneous negotiations and threatening to withdraw or modify the earlier agreement if free riding continued.

In summary, tariff bargaining under the RTAA exhibited a number of central features: The approach to tariff bargaining was decidedly bilateral and was chosen only after governments had considered, attempted, and ultimately rejected multilateral tariff bargaining; prior European experience with concession erosion and bargaining tariffs was at the heart of prominent issues that influenced the design and implementation of the RTAA along important dimensions; and unconditional MFN, the principal-supplier rule, split concessions, and withdrawal/modification clauses were understood to be central to the operation of reciprocal tariff bargaining under the RTAA.

Between 1934 and 1947, the United States successfully concluded separate bilateral agreements with 29 countries under the RTAA. Encouraged by this success, the United States pushed for the establishment of a multilateral institution built upon the key components of the RTAA, and in 1946 formal negotiations began for the creation of an International Trade Organization. In 1947, the GATT was negotiated and was intended to serve as an interim agreement, but the International Trade Organization was never ratified by the U.S. Congress.

The objectives of the member governments in creating the GATT are described in its Preamble and include “expanding the production and exchange of goods.” The Preamble also states the governments’ belief that “reciprocal and mutually advantageous arrangements directed to the substantial reduction in tariffs and other barriers to trade and to the elimination of discriminatory treatment in international commerce” would contribute toward these objectives.

In total, there were eight rounds of GATT negotiations that together spanned almost 50 years. In the earlier rounds, the primary focus was the reduction of import tariffs on goods. In the final GATT round, known as the Uruguay Round, governments took on a number of new issues (e.g., investment and intellectual property) and formed the WTO. The WTO has sponsored a ninth round, the Doha Round, that is still ongoing.

## 4.2. Architecture

Membership in the GATT/WTO carries with it an obligation to abide by certain rules. In the GATT, these rules were contained in a set of 39 articles. These GATT articles have been incorporated into the WTO, and the WTO has also extended the principles embodied in them to a variety of new issues. Here, we provide a brief overview of the principles embodied in these articles.

GATT articles can be sorted into three broad categories: substantive obligations, exceptions to those obligations, and dispute settlement procedures. The substantive obligations of a GATT/WTO member relate to tariff commitments, MFN treatment, and a general code of conduct in the international-trade arena. These provisions oblige member governments to use tariffs rather than nontariff barriers as protective measures, to apply them on a nondiscriminatory basis to other members, and to honor any tariff bindings made in a GATT/WTO negotiation.

At the same time, the GATT/WTO also provides for a variety of exceptions to these obligations. Some exceptions permit a government to suspend an obligation under certain conditions or to withdraw a previous concession through renegotiation. The logic of including exceptions for such original actions is that a government is more likely to agree to a tariff commitment if it knows that the legal system has safeguards allowing its concessions to be modified or withdrawn under appropriate conditions. But a tariff commitment would lose its meaning if exceptions for original actions were not disciplined in some way, so GATT/WTO rules also permit exceptions for retaliatory actions. Specifically, if a government modifies or withdraws a previous concession, then GATT/WTO rules recognize that a cost may be borne by its trading partner, and if the government fails to compensate the trading partner in an amount that is acceptable to the trading partner, then the partner is allowed to achieve compensation through retaliation. The meaning of retaliation is that the trading partner can withdraw a concession of a substantially equivalent nature.

We now come to the third element mentioned above: the GATT/WTO dispute settlement procedures. Here a key issue is the determination of whether the actions by one country nullify or impair the benefits that another country expects under the agreement. This occurs when actions are taken by one country that “harmed the trade of another, and which ‘could not reasonably have been anticipated’ by the other at the time it negotiated for a concession” (Jackson 1997, p. 115). In the typical complaint, a country is alleged to have failed to comply with its GATT/WTO obligations, as when it imposes quantitative restrictions or violates MFN (for a description of the trade disputes that occurred under the GATT, see Hudec 1993, Bown 2002; for legal and economic analyses of the major disputes under the WTO, see Horn & Mavroidis 2001–2007).

Every GATT/WTO dispute begins with a consultation phase among the involved parties. Resolution of the dispute may be (and often is) achieved in this first phase. Otherwise, a second phase is initiated in which a GATT/WTO panel (or appellate body) conducts an investigation and issues a ruling and recommendation. If the panel finds that nullification or impairment has occurred, then it recommends that the offending country correct any illegal measures, and resolution of the dispute may occur at this point. The offending country may be unwilling to comply with the panel’s recommendation, however, and may seek a negotiated resolution by offering to compensate the harmed country, perhaps in the form of an MFN tariff reduction on some other good. However, if compensation is not offered, or if it is offered but rejected, the harmed country may then retaliate with an authorized and discriminatory suspension of tariff concessions. The number of authorized retaliations has been small in practice, but as Rhodes (1993, p. 109) observes, the threat of authorized retaliation is often the catalyst for resolution in the earlier phases of the dispute.<sup>15</sup>

---

<sup>15</sup>Under the GATT, retaliation was authorized only once. Under the WTO, retaliation has been authorized and used in a number of cases (see Mavroidis 2000 and World Trade Organ. 2001, p. 28, for further discussion).

As our discussion in this section confirms, MFN is a pillar of the GATT/WTO architecture, and the enforcement provisions of the GATT/WTO are elaborately developed. The representation of reciprocity in the GATT/WTO, however, may be less apparent from this discussion. We therefore comment briefly on the role of reciprocity in the GATT/WTO.

The GATT/WTO principle of reciprocity refers to the ideal of mutual changes in trade policy that bring about changes in the volume of each country's imports that are of equal value to changes in the volume of its exports. In our discussion above, the notion of reciprocity arises in two places. First, as observed above, governments negotiate in GATT/WTO rounds with the stated goal of obtaining mutually advantageous arrangements through reciprocal reductions in tariff bindings: In this context, it is often observed that governments approach negotiations seeking a balance of concessions, so that there is a rough equivalence between the market-access value of the tariff cuts offered by one government and the concessions won from its trading partner. Second, when a government seeks to renegotiate and modifies or withdraws a previous concession as an original action, and more generally whenever a government takes an action that nullifies or impairs the benefits expected under the agreement by another government, GATT/WTO rules permit affected trading partners to withdraw substantially equivalent concessions and thereby to retaliate in a reciprocal manner.

## 5. THE DESIGN AND PRACTICE OF THE GATT/WTO: A VIEW FROM THE TERMS-OF-TRADE THEORY

We now turn to the fourth and final step in our review. Here we draw on the recent theoretical and empirical literature to interpret the design and practice of the GATT/WTO. We begin with the principle of reciprocity.

### 5.1. Reciprocity

We suggest above that the central problem faced by governments as they considered the design of the GATT/WTO can be given a simple interpretation: terms-of-trade manipulation. From this vantage point, we may now pose the question, Why would the principle of reciprocity be attractive to governments? The answer is that reciprocity describes a fixed-terms-of-trade rule to which mutual tariff changes must conform, and in an environment in which terms-of-trade manipulation is the problem to be fixed, a fixed-terms-of-trade rule is bound to be attractive.

We now explain these points more fully (see Bagwell & Staiger 1999a, where these results are derived formally). We first propose a formal definition of reciprocity. Suppose that, beginning from an initial pair of tariffs,  $(\tau^0, \tau^{*0})$ , a tariff negotiation results in a change to the new pair of tariffs,  $(\tau^1, \tau^{*1})$ . Denoting the initial world and domestic local prices as  $\tilde{p}^{w0} \equiv \tilde{p}^w(\tau^0, \tau^{*0})$  and  $p^0 \equiv p(\tau^0, \tilde{p}^{w0})$ , and the new world and domestic local prices as  $\tilde{p}^{w1} \equiv \tilde{p}^w(\tau^1, \tau^{*1})$  and  $p^1 \equiv p(\tau^1, \tilde{p}^{w1})$ , respectively, we say that the tariff changes conform to the principle of reciprocity provided that

$$\tilde{p}^{w0} [M_x(p^1, \tilde{p}^{w1}) - M_x(p^0, \tilde{p}^{w0})] = [E_y(p^1, \tilde{p}^{w1}) - E_y(p^0, \tilde{p}^{w0})], \quad (7)$$

where changes in trade volumes are valued at the existing world price.<sup>16</sup> We next use the balanced trade condition (Equation 1)—which must hold at both the initial tariffs and the new tariffs—to establish that Equation 7 may be rewritten as

$$[\tilde{p}^{w1} - \tilde{p}^{w0}]M_x(p^1, \tilde{p}^{w1}) = 0. \quad (8)$$

According to Equation 8, reciprocity can be given a simple and striking characterization: Mutual changes in trade policy conform to the principle of reciprocity if and only if they leave the world price unchanged. With this characterization in hand, we now consider the application of reciprocity within GATT/WTO practice.

As noted above, a first application of reciprocity refers to the balance of concessions that governments seek through a negotiated agreement. Such behavior is hard to reconcile with the standard economic argument that unilateral free trade is in a country's best interests. The terms-of-trade theory, however, offers a simple interpretation of this application of reciprocity.

To see this, suppose that governments begin with Nash tariffs and observe that, at the Nash point, we may use condition 4 and Equations 5 and 6 to conclude that  $W_p < 0 < W_{p^*}$ . Next observe that, if governments were to reduce tariffs in a reciprocal manner, then according to Equation 8 the world price would be preserved, whereas the domestic local price  $p$  would fall and the foreign local price  $p^*$  would rise. However, this means that both the domestic-government welfare and the foreign-government welfare would then rise (because  $W_p < 0$  and  $W_{p^*} > 0$ ). Evidently, the structure of international cost shifting implies that, beginning from their Nash tariff choices, both governments would desire tariff liberalization and the implied greater trade volume if this could be achieved without a decline in the terms of trade. The principle of reciprocity harnesses this desire and therefore activates efficiency-enhancing tariff-liberalizing forces in this environment.

As noted above, a second application of reciprocity in the GATT/WTO arises whenever a government takes an action that nullifies or impairs the benefits expected under the agreement by another government. An important instance of this second application concerns the rules that govern the process by which tariff bindings may be renegotiated. Under GATT Article XXVIII, a country may propose to modify or withdraw a concession agreed upon in a previous round of negotiation and may offer some compensation to its trading partner in return. But if the country and its trading partner are unable to reach agreement on the appropriate level of compensation, the country is permitted to implement its proposed change anyway, with the understanding that the trading partner may then reciprocate. Here the principle of reciprocity is used to moderate the response of the trading partner, who is allowed to withdraw substantially equivalent concessions of its own.

In light of the explicit provisions governing renegotiation, market-access negotiations in the GATT/WTO may be viewed as a multistage game. Governments first agree to bind their tariffs at specific levels in a round of negotiations. Then each government considers whether it would prefer to raise its tariff above the bound level, anticipating that the outcome of any renegotiation will conform to reciprocity, preserving the balance struck by the original negotiations, and thus preserving the world price. In this setting, a pair of

<sup>16</sup>This defines reciprocity from the perspective of the domestic country. However, in our two-country setting, tariff changes conform to reciprocity for the domestic country if and only if they conform to reciprocity for the foreign country as well.

initially negotiated tariffs will be renegotiated if, at the initial tariff pair, either government desires less trade volume and the associated change in its local price at the fixed world price. This suggests that many points on the efficiency frontier could be susceptible to renegotiation in this setting. In fact, there is only one efficient tariff pair that is robust to the possibility of renegotiation under the reciprocity rule and that is the politically optimal tariff pair. If governments were to negotiate to the efficient political optimum, at which each government has achieved its preferred local price, then neither government would have any desire to deviate from this point if in so doing it could not alter the terms of trade in its favor. The principle of reciprocity in this second application can be understood to harness this feature and therefore to create an environment in which the efficient political optimum, once achieved, remains a robust and stable outcome.

This discussion also reveals a broader point: In effect, governments are penalized under the GATT/WTO reciprocity rule if they attempt to negotiate an efficient tariff pair other than the political optimum. Suppose, for example, that the domestic government is successful in pushing the initial negotiations to a point on the efficiency frontier that is more favorable to it than the political optimum. At the political optimum, the domestic government's welfare cannot be enhanced with a change in its local price, so at this alternative preferred point, the terms of trade must be more favorable for the domestic government than the terms of trade at the political optimum; by implication, the terms of trade must then be less favorable for the foreign government at this alternative point relative to the political optimum. Notice, however, that if the initial negotiations lead to this alternative point, then at the fixed but less-favorable terms of trade, the foreign government will naturally want less trade volume (and the associated change in its local price) as compared with the political optimum, and the foreign government can achieve this through renegotiation. Therefore, some of the benefit to the domestic government of pushing the initial negotiating point away from the political optimum would be given up in the subsequent renegotiation. As a result, the domestic government may be less eager to push negotiations away from the political optimum in the first place. As this example illustrates, the reciprocity rule can help to mitigate the power asymmetries that governments might otherwise display at the bargaining table. In this way, it encourages governments to select the rules-based politically optimal tariffs.

Recent empirical evidence confirms the importance of the first GATT/WTO application of reciprocity discussed above. For example, Shirono (2004) finds that the tariff cuts agreed to in the Uruguay Round of GATT negotiations conformed closely to the reciprocity norm and that the economic significance of the terms-of-trade changes induced by these tariff cuts were quite limited. Limao (2006, 2007) also finds evidence consistent with reciprocity. In particular, focusing on U.S. tariff cuts in the Uruguay Round and constructing a measure of market-access concessions while instrumenting to address the potential endogeneity issues, Limao reports that a decrease in the tariff of a U.S. trading partner that exports a given product leads to a decrease in the U.S. tariff on that product and that a significant determinant of cross-product variation in U.S. tariff liberalization is the degree to which the United States received reciprocal market-access concessions from the corresponding exporting countries. Finally, Karacaovali & Limao (2008) perform a similar exercise for the European Union (EU) tariff cutting behavior in the Uruguay Round and find analogous support for the importance of reciprocity in explaining the pattern of EU tariff cuts: EU tariff reductions were largest for those products exported by countries who themselves granted large reductions in tariffs. Although more evidence is needed

before the issue is settled, as an empirical matter it does appear that actual tariff bargaining outcomes in the GATT/WTO conform to a reciprocity norm.

Regarding the second application of reciprocity in the GATT/WTO, the empirical questions at issue are somewhat different. It is clear as a legal matter that, in this application, reciprocity in the GATT/WTO is defined by equivalent trade effects, much as the definition in Equation 7 indicates, and that in practice this concept guides the permissible response to nullification or impairment in the GATT/WTO.<sup>17</sup> What is less clear is whether the principle of reciprocity in this application serves to guide governments toward a rules-based outcome such as the political optimum. On the one hand, some features of the political optimum seem to be present in GATT/WTO conventions and bargaining outcomes: The principal-supplier rule creates a presumption that small players in a market will typically not be asked by their trading partners to make significant market-access concessions in that market; special and differential treatment clauses exempt many small countries from a host of other GATT/WTO obligations to which other countries must conform; most of the significant market-access concessions have been made by the large industrialized countries; and even where a country that is small in a given market accepts on paper obligations that apply to that market, the GATT/WTO enforcement procedures operate on demand, and so a small player in a market can likely expect to be able to violate obligations in that market without bringing retaliation upon itself in any event. On the other hand, there are many accounts from diplomats and delegates of small and developing countries that run counter to this view (e.g., see Jawara & Kwa 2003 and the review of Jawara & Kwa in Staiger 2006). In any event, this is a critical question, both for the theory and for the policy debate surrounding the performance of the WTO. To date, we are unaware of any empirical work that directly addresses it.

## 5.2. Most-Favored Nation

We next turn to the nondiscrimination principle, embodied in the GATT/WTO rule that requires all tariffs to be applied on an MFN basis to the trade of other member countries. To begin, we describe a three-country extension of the benchmark general-equilibrium model developed in Section 2.1.1.

The domestic country now exports good  $y$  to two foreign countries, denoted by the superscripts  $*1$  and  $*2$ , and imports good  $x$  from each of these countries (who do not trade with each other). Each foreign country can impose a tariff on its imports of good  $y$  from the domestic country (we denote the tariff of foreign country  $i$  by  $\tau^{*i}$ ), whereas the domestic country can set tariffs on its imports of good  $x$  from the two foreign countries. Notice that if the domestic country applies the tariff  $\tau^1$  to imports from foreign country 1 and the discriminatory tariff  $\tau^2 \neq \tau^1$  to imports from foreign country 2, then separate world prices  $p^{w1}$  and  $p^{w2}$  apply to its trade with foreign countries 1 and 2, respectively. This follows because there can be only one local price in the domestic economy, and the pricing relationships  $p = \tau^1 p^{w1}$  and  $p = \tau^2 p^{w2}$  then imply  $p^{w1} \neq p^{w2}$  whenever  $\tau^1 \neq \tau^2$ .

In this setting, the MFN rule imposes a simple requirement: The domestic country must apply a common tariff level  $\tau^1 = \tau^2 \equiv \tau$  to the imports of  $x$ , regardless of whether

<sup>17</sup>See, for example, the Appellate Body Opinion in World Trade Organ. Appell. Body (2004) on the trade-effects interpretation of reciprocity. Although it is clear that the trade-effects concept of reciprocity applies in this context, there is still the implementation issue of how trade effects are assessed, and a remaining question is whether the trade-effects approach can be implemented in a meaningful way (e.g., see Spemann 2006).

these imports originate from foreign country 1 or 2. An important implication of the MFN rule is then that a single equilibrium world price,  $\tilde{p}^w(\tau, \tau^{*1}, \tau^{*2})$ , must prevail; consequently, we may continue to express government preferences with the simple representation  $W(p, \tilde{p}^w)$ ,  $W^{*1}(p^{*1}, \tilde{p}^w)$ , and  $W^{*2}(p^{*2}, \tilde{p}^w)$ , the same representation we use in the two-country setting.

At a basic level, the appeal of the MFN principle can already be appreciated: In a multilateral world, the MFN principle ensures that the international externality at the root of the problem to be solved continues to exhibit the same structure as in the simpler two-country setting. This suggests in turn that, in the company of MFN, the attractive properties of reciprocity described above might extend to a multilateral setting. This is indeed the case. Under the MFN principle and beginning from noncooperative tariffs, each country can gain from reciprocal liberalization, and MFN politically optimal tariffs (which are efficient) are robust to renegotiation under the reciprocity rule. In light of our earlier discussion, in a multilateral world MFN and reciprocity together may be understood as encouraging governments to select the politically optimal tariffs, thereby mitigating the power asymmetries that governments might otherwise wield at the bargaining table.<sup>18</sup>

However, new issues also arise in a many-country world that are themselves related to the adoption of the MFN principle. One issue concerns concession erosion: As discussed in Section 4, in anticipation that trade liberalization would proceed according to a sequence of bilateral negotiations, the MFN principle was included in the RTAA and subsequently in the GATT/WTO in part to address this issue. Another issue involves bargaining tariffs: In the presence of the MFN principle, it was feared that free riding and the implied loss of bargaining power could become serious obstacles to successful negotiations, as discussed in Section 4 as well. At the heart of these issues is a common theme: When countries engage in bilateral tariff bargaining, how can third-country spillovers be minimized?

Strikingly, the twin pillars of MFN and reciprocity can be understood as minimizing third-country spillovers from bilateral tariff bargaining. (These and related points are developed in Bagwell & Staiger 2005b, 2007.) To see why, consider the case in which foreign country 2 is not involved in the negotiations and keeps its tariff unaltered. In the presence of MFN, the domestic government and the government of foreign country 1 can still negotiate a reciprocal reduction in their respective tariffs  $\tau$  and  $\tau^{*1}$ , which leaves the terms of trade  $\tilde{p}^w(\tau, \tau^{*1}, \tau^{*2})$  unaltered but reduces  $p$  while raising  $p^{*1}$  and which therefore provides these two countries with greater trade volume. Recall, however, that in foreign country 2 we have the pricing relationship  $p^{*2} = p^w/\tau^{*2}$ . It follows that, with  $\tau^{*2}$  held fixed, if the negotiation between the domestic country and foreign country 1 abides by MFN (so that a single equilibrium world price  $\tilde{p}^w$  prevails) and reciprocity (so that  $\tilde{p}^w$  is unaltered), then  $p^{*2}$  and therefore  $W^{*2}(p^{*2}, \tilde{p}^w)$  and foreign country 2's trade volume are unaltered by these negotiations as well. In abiding by the principles of MFN and reciprocity, the

<sup>18</sup>These results are established in Bagwell & Staiger (1999a), where it is also established that neither reciprocity nor MFN can by itself exhibit these features in a many-country setting. McCalman (2002) offers a different formalization of the benefits of the MFN rule. In the setting he considers, informational asymmetries play a central role, and provided that the number of small countries is sufficiently great, a large country has diminished capacity under the MFN rule to hold an agreement hostage and extract rents from its small trading partners, enhancing both global efficiency and the payoffs of small countries. Other implications of the MFN rule are explored in Choi (1995), Ludema (1991), and Saggi (2004).

domestic government and the government of foreign country 1 have thus engineered a bilateral tariff bargain without third-country spillovers.

How can it be that exporters from foreign country 2 experience a reduced MFN tariff from the domestic country yet do not enjoy any increase in their export volume? The reason is that these exporters compete for sales in the domestic market with exporters from foreign country 1, and exporters from foreign country 1 become more competitive owing to the negotiated reduction in foreign country 1's import tariff, which releases productive resources from foreign country 1's import-competing sector and allows these resources to move into foreign country 1's export sector.

It is also interesting to observe that MFN by itself is not enough to accomplish this feat. This can be seen by noting that a nonreciprocal negotiation between the domestic country and foreign country 1 could also be undertaken in the presence of MFN, but such a negotiation would alter  $\tilde{p}^w$  and hence (with  $\tau^{*2}$  held fixed) alter  $p^{*2}$  and therefore in general alter  $W^{*2}(p^{*2}, \tilde{p}^w)$  and foreign country 2's trade volume. This suggests a qualification to the position that is sometimes taken in the literature that the MFN principle is by itself sufficient to eliminate the risk of concession erosion. (This position is suggested in Schwartz & Sykes 1997 and Ethier 2004.)

The preceding discussion leads to an important insight: The MFN rule permits the liberalizing force of reciprocity to be harnessed in an essentially bilateral manner even in a multilateral world. This means that, at least in principle, countries can negotiate split concessions with a sequence of trading partners who need not fear that those concessions will be eroded by later bargains, as long as the bargains abide by the principles of MFN and reciprocity. In situations in which strict reciprocity is not feasible (and hence some spillovers become inevitable), ordering this sequence in accordance with the principal-supplier rule and under the threat of modification or withdrawal can help preserve a country's bargaining power along the way. This describes a negotiating forum and a set of bargaining tactics that broadly mirror those anticipated from the U.S. experience with the RTAA. (These points are developed formally in Bagwell & Staiger 2007.)

Are these features borne out in GATT/WTO practice? The existing evidence takes two forms. One form concerns the trade-volume impacts associated with GATT/WTO membership. According to the findings of Subramanian & Wei (2007), GATT/WTO membership is associated with a large and significant increase in trade volumes for developed countries, but developing-country members experience a weak or nonexistent impact on their trade volumes. Given that developed countries have been the main participants in GATT/WTO-sponsored tariff bargaining, whereas developing countries have been largely inactive in this capacity, Subramanian & Wei's findings are broadly consistent with the interpretation that the participants in GATT/WTO tariff bargaining have successfully neutralized significant third-country spillovers.<sup>19</sup> Of course, an alternative interpretation is that developed countries have simply found ways around the MFN principle and have in their tariff bargaining discriminated against nonparticipating GATT/WTO members. A paper whose findings weigh against this alternative interpretation is Bown (2004c). In the

<sup>19</sup>In fact, in a provocative paper, Rose (2004) reports finding no significant trade-volume impact of GATT/WTO membership whatsoever, but Rose fails to allow for a differential impact across countries. As the findings of Subramanian & Wei (2007) confirm, and as the theory discussed implies, allowing for differential trade-volume impacts based on different levels of bargaining participation is crucial for understanding the impacts of GATT/WTO membership [see also Tomz et al. (2007) who argue that Rose's results are overturned when a more complete definition of GATT membership is employed].



context of GATT/WTO bilateral dispute settlement negotiations at least, Bown finds that countries do indeed abide by the MFN principle.

This first form of evidence is therefore suggestive, but it is far from conclusive. An interesting avenue for further exploration would be to draw a tighter link between the trade effects experienced by GATT/WTO members and their negotiated tariff commitments. For example, according to the logic of the discussion above, if GATT/WTO bargains stick closely to the MFN and reciprocity principles, it is a country's own liberalization relative to that of competing exporters, more than the liberalization in the markets to which it exports, that should be decisive in determining the trade effects it experiences from GATT/WTO membership.

A second form of evidence looks directly at the pattern of tariff bindings negotiated in the GATT/WTO and seeks to uncover possible evidence of free riding and its impacts on bargaining outcomes. Ludema & Mayda (2007, 2009) relate the expected severity of the MFN free-rider problem to a Herfindahl index of the concentration of foreign exporters into a given country's markets, interacted with cross-country variation in the foreign export supply elasticities faced by a given country to reflect its power over the terms of trade. Using this relationship, they find evidence of free riding in the tariff bargaining that occurs in GATT/WTO negotiating rounds and suggest that the impact of this free riding on GATT/WTO tariff bargaining outcomes could be substantial. Using the relationship developed by Ludema & Mayda, Bagwell & Staiger (2010) explore the possibility of a free-rider problem in the context of accession negotiations in the WTO and find little evidence of a free-rider problem in that setting. Ludema & Mayda's approach is developed to get around the lack of available data on the actual participants in any given GATT/WTO tariff bargain. Detailed bargaining records do exist, however, and if made available to researchers, they could provide a valuable tool for further empirical work on this important question.

Finally, one might wonder whether the fear of concession erosion remains a powerful force in determining GATT/WTO bargaining outcomes. This question takes on special relevance because the MFN principle is a central means by which the fear of concession erosion was to be allayed, yet exceptions to the MFN principle under GATT Article XXIV have been widely exercised by governments for the purpose of forming preferential agreements. Here we simply observe that the fear of concession erosion may have been replaced by the related fear of preference erosion, which can also become a powerful force—a “stumbling block” in Bhagwati's (1991) terminology—against further MFN tariff reductions. Support for this position is provided by Limao (2006, 2007) and Karacaovali & Limao (2008), who model the interaction between preferential and multilateral negotiations and find evidence for a significant stumbling-block effect of the preferential agreements negotiated by the United States and the EU, driven by the incentive of U.S. and EU preferential partners to stop the preference erosion that further U.S. and EU MFN tariff liberalization would imply.<sup>20</sup>

---

<sup>20</sup>We note, however, that this incentive is not always the dominant force determining the impact of preferential agreements on MFN tariffs: Focusing on a set of developing countries whose MFN tariffs are relatively high, Estevadordal et al. (2008) find that membership in a free-trade agreement leads to a reduction in MFN tariffs of the member countries, possibly reflecting the stronger tariff-complementarity effects that arise when MFN tariffs are high (on the tariff-complementarity effect, see Bagwell & Staiger 1999b; Freund 2000; Ornelas 2005, 2007). Freund & Ornelas (2010) survey the literature on preferential agreements and their relationship to the GATT/WTO more broadly.

### 5.3. Enforcement and Dispute Settlement Procedures

As discussed in Section 4.2, membership in the GATT/WTO carries with it an obligation to abide by a set of rules. But how are these rules enforced? After all, if under the rules governments manage to negotiate from the Nash point to a point on the contract curve, such as the political optimum, the temptation will be substantial for a government to unilaterally select a high tariff and shift costs, and this temptation does not go away simply because an agreement is signed. Rather, as there is no world jail into which government leaders are thrown if they violate GATT/WTO rules, an effective GATT/WTO must ensure that such temptations to deviate from the agreement are balanced against the anticipated costs of the retaliatory response by other governments that the deviation would provoke. That is, if it is to be effective, the GATT/WTO must be self-enforcing.

As emphasized more generally by McMillan (1986, 1989), Dixit (1987), and Bagwell & Staiger (1990), among others, the enforcement issues associated with trade agreements may be analyzed using the theory of repeated games, and a large literature has emerged on this topic. (Recent theoretical papers include Ederington 2001; Bond & Park 2002; Chisik 2003; Agur 2008; Bagwell & Staiger 2003, 2005a; Limao 2005; Lee 2007; Zissimos 2007; Klimenko et al. 2008; Martin & Vergote 2008; Bagwell 2009; Beshkar 2009; Park 2009; and Limao & Saggi 2008. Related empirical work includes Prusa & Skeath 2001 and Blonigen & Bown 2003.) Here we emphasize just three points.

First, the repeated-game perspective is broadly consistent with the GATT/WTO enforcement provisions as described in Section 4.2. In particular, as indicated above, the creation of the GATT/WTO and its nullification-or-impairment procedures may be viewed as an attempt to replace the Nash outcome with a more efficient equilibrium outcome. To accomplish this, governments agreed to limit the use of retaliation along the equilibrium path and reposition it as an off-equilibrium-path threat that enforces the rules. This view is well captured in a statement by one of the drafters of the GATT's nullification-or-impairment clause (as quoted in Petersmann 1997, p. 83):

We have asked the nations of the world to confer upon an international organization the right to limit their power to retaliate. We have sought to tame retaliation, to discipline it, to keep it within bounds. By subjecting it to the restraints of international control, we have endeavored to check its spread and growth, to convert it from a weapon of economic warfare to an instrument of international order.

We stress that there have been numerous GATT/WTO disputes whose resolution has entailed some form of policy response by the disputants, either in the form of explicit, authorized retaliation (rarely in the GATT, more often in the WTO) or in the form of a settlement agreement reached in the shadow of authorized retaliation or its anticipation (the majority of GATT/WTO cases), so a limited role for retaliation on the equilibrium path does arise in the GATT/WTO. However, from the perspective of the theory of repeated games, this on-equilibrium-path retaliation can be interpreted as adjustments to the bargain that are made in response to shocks that would otherwise upset the balance between the temptation to deviate from the bargain and the costs of the penalty for deviation. Consistent with the theory of repeated games, it is this penalty, which could amount to a breakdown of the entire GATT/WTO system and a return to a Nash trade war and which is the ultimate threat that maintains the international order, that remains off the equilibrium path (for a more extensive

discussion of the relationship between retaliation in the GATT/WTO and the theory of repeated games, see Bagwell & Staiger 2002b, chapter 6).

A second point is the special challenge that smaller countries face in ensuring that their rights are enforced in the GATT/WTO, given that enforcement depends importantly on the ability to retaliate (for an analysis of enforcement issues that arise between a small and a large country, see Park 2000; for evidence on the important effect that the ability to retaliate has on the resolution of GATT/WTO disputes, see Bown 2004a,b). This issue has particular relevance for developing country members, who, as Hudec (2000) recounts, first put forward a proposal on GATT remedies in 1965 suggesting that collective retaliation be permitted in cases in which a large country violated its obligations to a developing country. This raises the interesting question of whether permitting multilateral retaliation in the context of a bilateral dispute is warranted in some circumstances. On the one hand, as the quotation above suggests, an important purpose of the GATT/WTO dispute settlement procedures is to restrain retaliation and “check its spread and growth,” and any move toward multilateral retaliation would clearly go against this purpose. On the other hand, it is difficult to see how smaller countries could attain equal footing in a GATT/WTO dispute with their large trading partners without the aid of multilateral retaliation in some form. More recently, in the ongoing Doha Round Mexico has proposed a number of changes to the dispute settlement procedures, among them a variation on the idea of multilateral retaliation according to which the right of retaliation would be made tradeable (see World Trade Organ. 2002). Maggi (1999) provides a theoretical framework for understanding the potential benefits of multilateral retaliation, and there has been some recent attention to this issue stimulated by the Mexican proposal (e.g., see the analysis of auctioning retaliation rights in Bagwell et al. 2007 and the analysis of the exchange of bonds as an enforcement mechanism in Limao & Saggi 2008). But the relevant questions pertaining to this important issue have just begun to be explored.

Finally, although the literature discussed above interprets disputes as fundamentally about enforcement, many GATT/WTO disputes seem to be at least as much about interpreting vague clauses in the agreement or filling gaps where the agreement is simply silent. Moreover, some of the most intense debates about the design of the dispute settlement procedures concern the appropriate degree of activism (e.g., see Goldstein & Steinberg 2007): Should WTO panels be allowed to engage in judicial lawmaking, or should they be constrained to rule only on the obligations that are clearly stated in the agreement? Formal analysis of these issues requires that the contractual incompleteness of the GATT/WTO be placed at center stage, and although recent work has begun to explore these issues, such analysis is still in its infancy.<sup>21</sup>

## 6. CONCLUSION

Above we survey recent economic research that attempts to understand and interpret the design and practice of the GATT/WTO. Our review focuses on three of the most central features of the GATT/WTO—reciprocity, nondiscrimination, and enforcement/dispute

---

<sup>21</sup>A recent paper by Horn et al. (2010) builds on the writing-costs approach of Battigalli & Maggi (2002) to develop a theory of trade agreements as endogenously incomplete contracts, but that paper does not consider the role of dispute settlement procedures. A paper that does consider the role of dispute settlement procedures in a related incomplete-contracts setting is Maggi & Staiger (2008).

settlement—but leaves out a number of other active areas of research. We conclude by mentioning two.

A first area is the treatment of nonborder measures in the GATT/WTO. In our discussion above, we feature a simple setting in which governments negotiate restrictions on import tariffs alone. Of course, in reality, governments select domestic or nonborder policies as well, and these policies may also impact trade flows. As emphasized in much recent research, an efficient trade agreement must also restrict governments from using domestic policies to favor import-competing firms. For example, an efficient agreement must place restrictions on the ability of governments to undermine negotiated market-access commitments by offering new subsidies to their import-competing firms. At the same time, restrictions on domestic policies should not be too severe; for example, subsidies can be a first-best instrument with which to target a domestic market failure. This tension is reflected in recent research that considers the optimal treatment of domestic subsidies in a trade agreement and also in recent work that explores related issues with respect to policies that concern domestic labor and environmental standards (when the international externalities associated with such standards are pecuniary).<sup>22</sup> A related set of recent research considers whether an agreement that links tariffs and standards might enhance efficiency by facilitating improved enforcement or information-revelation capabilities (e.g., see Ederington 2001, 2002; Spagnolo 2001; Limao 2005; Lee 2007). Finally, recent work also indicates that the treatment of domestic policies in a trade agreement should balance the additional contracting costs associated with new rules for domestic policies against the degree to which such policies represent an effective means of manipulating market access (see Horn et al. 2010).

A second area is the treatment of export policies in the GATT/WTO. Whereas GATT rules concerning export subsidies were somewhat permissive, export subsidies are now prohibited in the WTO (for further discussion of the treatment of export subsidies in the GATT and now the WTO, see Sykes 2005). A theory of how export subsidies should be treated in a trade agreement must begin by explaining why a government might use an export subsidy. The theoretical literature emphasizes that a government might use an export subsidy in a strategic fashion so as to shift profits or delocate firms from competing foreign export sectors (for a survey of the strategic-trade literature, see Brander 1995). In short-run models in which profits can be shifted but the location of firms is fixed, the governments of countries that export a given good could enjoy greater welfare if they were to reach an agreement under which they limit export subsidies. This result appears to offer a potential interpretation for the prohibition on export subsidies in the WTO. This interpretation, however, neglects the interests of consumers in importing countries, who benefit from the lower prices that export subsidies induce. Global welfare actually may be lower when governments of exporting countries agree to limit export subsidies, so these models do not offer a compelling rationale for the prohibition of export subsidies.<sup>23</sup> In long-run

---

<sup>22</sup>Copeland (1990) offers an early model of the limits of cooperation when some domestic policies are left unrestricted. Bagwell & Staiger (2006) develop a model that focuses on the treatment of domestic subsidies in efficient trade agreements, and they evaluate GATT and WTO rules from this perspective (for further discussion of the legal rules concerning the use of domestic subsidies in the GATT and now the WTO, see Sykes 2005; for further discussion of the labor and environmental standards and trade-agreement theory, see Bagwell & Staiger 2001a, 2002b chapter 8; Bagwell et al. 2002; and Staiger & Sykes 2009).

<sup>23</sup>The same can be said for models of export subsidies based on political-economy considerations (for further discussion, see Brander & Spencer 1985, Bagwell & Staiger 2001c, Bagwell 2008).

models in which trade policies affect the entry and exit decisions of firms, if transport costs exist, then a country may be tempted to use an export subsidy, and such a subsidy would lower the welfare of its trading partner. Recent work suggests, however, that a country may not find an export subsidy attractive unless its import tariff is also low. This work suggests that a ceiling on export subsidies may enhance efficiency from a global standpoint once import tariffs have been negotiated to low levels, and it thereby provides a possible interpretation for the more restrictive treatment of export subsidies now found in the WTO.<sup>24</sup> The treatment of export policies in the GATT/WTO represents an important direction for further research.

## DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

## ACKNOWLEDGMENTS

We thank our reviewer, Peter Neary, for helpful comments. Parts of this review draw heavily from an earlier review article (Bagwell & Staiger 2002a) and on excerpts from chapter 7, pp. 205–34, “Economic theory and the interpretation of GATT/WTO” by Kyle Bagwell and Robert W. Staiger in *New Frontiers in Economics*, edited by Michael Szenberg and Lall Ramrattan. Copyright © 2004, Cambridge University Press. Reprinted with permission.

## LITERATURE CITED

- Agur I. 2008. The U.S. trade deficit, the decline of the WTO and the rise of regionalism. *Glob. Econ. J.* 8:4
- Anderson JA, Van Wincoop E. 2002. Borders, trade and welfare. In *Brookings Trade Forum 2001*, ed. D Rodrik, SM Collins, pp. 207–44. Washington, DC: Brookings Inst.
- Antras P, Staiger RW. 2008. *Offshoring and the role of trade agreements*. NBER Work. Pap. 14285
- Bagwell K. 2008. Remedies in the WTO: an economic perspective. In *The WTO: Governance, Dispute Settlement and Developing Countries*, ed. ME Janow, VJ Donaldson, A Yanovich, pp. 733–70. Huntington, NY: Juris
- Bagwell K. 2009. *Self-enforcing trade agreements and private information*. NBER Work. Pap. 14812
- Bagwell K, Mavroidis PC, Staiger RW. 2002. It’s a question of market access. *Am. J. Int. Law* 96:56–76
- Bagwell K, Mavroidis PC, Staiger RW. 2007. Auctioning countermeasures in the WTO. *J. Int. Econ.* 73:309–32
- Bagwell K, Staiger RW. 1990. A theory of managed trade. *Am. Econ. Rev.* 80:779–95
- Bagwell K, Staiger RW. 1999a. An economic theory of GATT. *Am. Econ. Rev.* 89:215–48
- Bagwell K, Staiger RW. 1999b. Regionalism and multilateral tariff cooperation. In *International Trade Policy and the Pacific Rim*, ed. J Piggott, A Woodland, pp. 157–85. London: MacMillan
- Bagwell K, Staiger RW. 2001a. Domestic policies, national sovereignty and international economic institutions. *Q. J. Econ.* 116:519–62

<sup>24</sup>Venables (1985) offers an initial treatment of the firm-delocation effect and the associated appeal of a unilateral export subsidy. Bagwell & Staiger (2009c) consider a linear version of the model and establish that free trade is then efficient and that a country finds a unilateral export subsidy appealing only once its import tariff is sufficiently low.

---

Reprinted in 2004 in  
*New Frontiers in  
Economics*, ed.  
M Szenberg,  
L Ramrattan,  
pp. 205–34.  
Cambridge, UK:  
Cambridge Univ. Press

---

- Bagwell K, Staiger RW. 2001b. Reciprocity, non-discrimination and preferential agreements in the multilateral trading system. *Eur. J. Polit. Econ.* 17:281–325
- Bagwell K, Staiger RW. 2001c. Strategic trade, competitive industries and agricultural trade disputes. *Econ. Polit.* 13:113–28
- Bagwell K, Staiger RW. 2002a. Economic theory and the interpretation of GATT/WTO. *Am. Econ.* 46:3–19
- Bagwell K, Staiger RW. 2002b. *The Economics of the World Trading System*. Cambridge, MA: MIT Press
- Bagwell K, Staiger RW. 2003. Protection over the business cycle. *Adv. Econ. Anal. Policy* 3:3
- Bagwell K, Staiger RW. 2005a. Enforcement, private political pressure and the GATT/WTO escape clause. *J. Legal Stud.* 34:471–513
- Bagwell K, Staiger RW. 2005b. Multilateral trade negotiations, bilateral opportunism and the rules of GATT/WTO. *J. Int. Econ.* 67:268–94
- Bagwell K, Staiger RW. 2006. Will international rules on subsidies disrupt the world trading system? *J. Int. Econ.* 73:309–32
- Bagwell K, Staiger RW. 2007. *Backward stealing and forward manipulation in the WTO*. Unpublished manuscript, Stanford Univ.
- Bagwell K, Staiger RW. 2009a. *Delocation and trade agreements in imperfectly competitive markets*. NBER Work. Pap. 15444
- Bagwell K, Staiger RW. 2009b. *Profit shifting and trade agreements in imperfectly competitive markets*. NBER Work. Pap. 14803
- Bagwell K, Staiger RW. 2009c. *The economics of trade agreements in the linear Cournot delocation model*. NBER Work. Pap. 15492
- Bagwell K, Staiger RW. 2010. What do trade negotiators negotiate about? Empirical evidence from the World Trade Organization. *Am. Econ. Rev.* In press
- Baldwin R. 1987. Politically realistic objective functions and trade policy. *Econ. Lett.* 24:287–90
- Battigalli P, Maggi G. 2002. Rigidity, discretion and the costs of writing contracts. *Am. Econ. Rev.* 92:798–817
- Beckett G. 1941. *The Reciprocal Trade Agreements Program*. New York: Columbia Univ. Press
- Beshkar M. 2009. *Trade skirmishes and safeguards: a theory of the WTO dispute settlement process*. Unpublished manuscript, Yale Univ.
- Bhagwati J. 1991. *The World Trading System at Risk*. Princeton, NJ: Princeton Univ. Press
- Blonigen BA, Bown C. 2003. Antidumping and retaliation threats. *J. Int. Econ.* 60:249–73
- Bond E, Park J-H. 2002. Gradualism in trade agreements with asymmetric countries. *Rev. Econ. Stud.* 69:379–406
- Bown CP. 2002. The economics of trade disputes, the GATT's Article XXIII and the WTO's dispute settlement understanding. *Econ. Polit.* 14:283–323
- Bown C. 2004a. On the economic success of GATT/WTO dispute settlement. *Rev. Econ. Stat.* 86:811–23
- Bown C. 2004b. Trade disputes and the implementation of protection under the GATT: an empirical assessment. *J. Int. Econ.* 62:263–94
- Bown C. 2004c. Trade policy under the GATT/WTO: empirical evidence of the equal treatment rule. *Can. J. Econ.* 37:678–720
- Bown C, Crowley MA. 2006. Policy externalities: How U.S. antidumping affects Japanese exports to the EU. *Eur. J. Polit. Econ.* 22:696–714
- Brainard L. 1994. Last one out wins: trade policy in an international exit game. *Int. Econ. Rev.* 35:151–72
- Brander JA. 1995. Strategic trade policy. In *Handbook of International Economics*, Vol. 3, ed. GM Grossman, K Rogoff, pp. 1395–455. Amsterdam: North Holland
- Brander JA, Spencer BJ. 1981. Tariffs and the extraction of foreign monopoly rents under potential entry. *Can. J. Econ.* 14:371–89

- Brander JA, Spencer BJ. 1984a. Tariff protection and imperfect competition. In *Monopolistic Competition and International Trade*, ed. H Kierzkowski, pp. 194–206. Oxford: Clarendon
- Brander JA, Spencer BJ. 1984b. Trade warfare: tariffs and cartels. *J. Int. Econ.* 16:227–42
- Brander JA, Spencer BJ. 1985. Export subsidies and international market share rivalry. *J. Int. Econ.* 18:83–100
- Broda C, Limao N, Weinstein D. 2008. Optimal tariffs and market power: the evidence. *Am. Econ. Rev.* 98:2032–65
- Brock WA, Magee SP. 1978. The economics of special interest politics. *Am. Econ. Rev.* 68:246–50
- Carmichael C. 1987. The control of export credit subsidies and its welfare consequences. *J. Int. Econ.* 23:1–19
- Caves RA. 1976. Economic models of political choice: Canada's tariff structure. *Can. J. Econ.* 9:278–300
- Chisik R. 2003. Gradualism in free trade agreements: a theoretical justification. *J. Int. Econ.* 59:367–97
- Choi JP. 1995. Optimal tariffs and the choice of technology: discriminatory tariffs vs. the most favored nation clause. *J. Int. Econ.* 38:143–60
- Copeland B. 1990. Strategic interaction among nations: negotiable and non-negotiable trade barriers. *Can. J. Econ.* 23:84–108
- Culbert J. 1987. War-time Anglo-American talks and the making of GATT. *World Econ.* 10:381–407
- Dhingra S. 2009. *Reconciling observed tariffs and the median voter model*. Unpublished manuscript, Univ. Wisconsin
- Dixit A. 1987. Strategic aspects of trade policy. In *Advances in Economic Theory: Fifth World Congress*, ed. TF Bewley, pp. 329–62. New York: Cambridge Univ. Press
- Ederington J. 2001. International coordination of trade and domestic policies. *Am. Econ. Rev.* 91:1580–93
- Ederington J. 2002. Trade and domestic policy linkage in international agreements. *Int. Econ. Rev.* 43:1347–67
- Estevadordal A, Freund C, Ornelas E. 2008. Does regionalism affect trade liberalization toward non-members? *Q. J. Econ.* 123:1531–75
- Ethier W. 2004. Political externalities, nondiscrimination, and a multilateral world. *Rev. Int. Econ.* 12:303–20
- Feenstra R. 1995. Estimating the effects of trade policy. In *The Handbook of International Economics*, Vol. 3, ed. GM Grossman, K Rogoff, pp. 1553–95. Amsterdam: North Holland
- Feenstra R, Bhagwati J. 1982. Tariff seeking and the efficient tariff. In *Import Competition and Response*, ed. J Bhagwati, pp. 245–58. Chicago: Univ. Chicago Press
- Findlay R, Wellisz S. 1982. Endogenous tariffs, the political economy of trade restrictions and welfare. In *Import Competition and Response*, ed. J Bhagwati, pp. 223–43. Chicago: Univ. Chicago Press
- Freund C. 2000. Multilateralism and the endogenous formation of free trade agreements. *J. Int. Econ.* 115:1317–41
- Freund C, Ornelas E. 2010. Regional trade agreements. *Annu. Rev. Econ.* 2:139–66
- Goldberg PK, Knetter MM. 1997. Goods prices and exchange rates: What have we learned? *J. Econ. Lit.* 35:1244–72
- Goldstein J, Steinberg R. 2007. *The rise of judicial liberalization at the WTO*. Unpublished manuscript, Stanford Univ.
- Grossman GM, Helpman E. 1994. Protection for sale. *Am. Econ. Rev.* 84:833–50
- Grossman GM, Helpman E. 1995. Trade wars and trade talks. *J. Polit. Econ.* 103:675–708
- Helpman E, Krugman PR. 1989. *Trade Policy and Market Structure*. Cambridge, MA: MIT Press
- Hillman AL. 1982. Declining industries and political-support protectionist motives. *Am. Econ. Rev.* 72:1180–87
- Hoekman B, Kostecki M. 2001. *The Political Economy of the World Trading System*. Oxford: Oxford Univ. Press. 2nd ed.

- Horn H, Maggi G, Staiger RW. 2010. Trade agreements as endogenously incomplete contracts. *Am. Econ. Rev.* In press
- Horn H, Mavroidis PC, eds. 2001–2007. *The WTO case law: the American Law Institute reporters' studies* (various years). Cambridge, UK: Cambridge Univ. Press
- Hudec RE. 1993. *Enforcing International Trade Law: The Evolution of the Modern GATT Legal System*. Salem, NH: Butterworth Legal Publ.
- Hudec RE. 2000. Broadening the scope of remedies in WTO dispute settlement. In *Improving WTO Dispute Settlement Procedures*, ed. F Weiss, J Weiss, pp. 345–76. London: Cameron May
- Jackson J. 1997. *The World Trading System*. Cambridge, MA: MIT Press. 2nd ed.
- Jawara F, Kwa A. 2003. *Behind the Scenes at the WTO: The Real World of International Trade Negotiations*. London: Zed Books
- Johnson HG. 1953–1954. Optimum tariffs and retaliation. *Rev. Econ. Stud.* 21:142–53
- Karacaovali B, Limao N. 2008. The clash of liberalizations: preferential vs. multilateral trade liberalization in the European Union. *J. Int. Econ.* 74:299–327
- Kennan J, Reizman R. 1988. Do big countries win tariff wars? *Int. Econ. Rev.* 29:81–85
- Klimenko M, Ramey G, Watson J. 2008. Recurrent trade agreements and the value of external enforcement. *J. Int. Econ.* 74:475–99
- Kreinin M. 1961. Effect of tariff changes on the prices and volume of imports. *Am. Econ. Rev.* 51:310–24
- Krugman PR. 1997. What should trade negotiators negotiate about? *J. Econ. Lit.* 35:113–20
- Kowalczyk C, Riezman R. 2009. *Trade agreements*. Unpublished manuscript, Tufts Univ.
- Lee GM. 2007. Trade agreements with domestic policies as disguised protection. *J. Int. Econ.* 71:241–59
- Limao N. 2005. Trade policy, cross-border externalities and lobbies: Do linked agreements enforce more cooperative outcomes? *J. Int. Econ.* 67:175–99
- Limao N. 2006. Preferential trade agreements as stumbling blocks for multilateral trade liberalization: evidence for the U.S. *Am. Econ. Rev.* 96:896–914
- Limao N. 2007. Are preferential trade agreements with non-trade objectives a stumbling block for multilateral liberalization? *Rev. Econ. Stud.* 74:821–55
- Limao N, Saggi K. 2008. Tariff retaliation versus financial compensation in the enforcement of international trade agreements. *J. Int. Econ.* 76:48–60
- Ludema R. 1991. International trade bargaining and the most-favored nation clause. *Econ. Polit.* 3:1–20
- Ludema RD, Mayda AM. 2007. *The free-riding effect of the MFN clause: evidence across countries*. Unpublished manuscript, Johns Hopkins Univ.
- Ludema RD, Mayda AM. 2009. Do countries free ride on MFN? *J. Int. Econ.* 77:135–50
- Maggi G. 1999. The role of multilateral institutions in international trade cooperation. *Am. Econ. Rev.* 89:190–214
- Maggi G, Rodriguez-Clare A. 1998. The value of trade agreements in the presence of political pressures. *J. Polit. Econ.* 106:574–601
- Maggi G, Rodriguez-Clare A. 2007. A political-economy theory of trade agreements. *Am. Econ. Rev.* 97:1374–406
- Maggi G, Staiger RW. 2008. *On the role and design of dispute settlement procedures in international trade agreements*. NBER Work. Pap. 14067
- Martin A, Vergote W. 2008. On the role of retaliation in trade agreements. *J. Int. Econ.* 76:61–77
- Matsuyama K. 1990. Perfect equilibria in a trade liberalization game. *Am. Econ. Rev.* 80:480–92
- Mavroidis PC. 2000. Remedies in the WTO legal system: between a rock and a hard place. *Eur. J. Int. Law* 11:763–813
- Mayer W. 1981. Theoretical considerations on negotiated tariff adjustments. *Oxf. Econ. Pap.* 33:135–53
- Mayer W. 1984. Endogenous tariff formation. *Am. Econ. Rev.* 74:970–85



- McCalman P. 2002. Multilateral trade negotiations and the most favored nation clause. *J. Int. Econ.* 57:151–76
- McMillan J. 1986. *Game Theory in International Economics*. New York: Harwood
- McMillan J. 1989. A game-theoretic view of international trade negotiations: implications for developing countries. In *Developing Countries and the Global Trading System*, Vol. 1, ed. J Whalley, pp. 26–44. Ann Arbor: Univ. Michigan Press
- Mill JS. 1844. *Essays on Some Unsettled Questions of Political Economy*. London: Parker
- Mitra D. 2002. Endogenous political organization and the value of trade agreements. *J. Int. Econ.* 52:473–85
- Mrazova M. 2009. *Trade negotiations when market access matters*. Unpublished manuscript, Oxford Univ.
- Olson M. 1965. *The Logic of Collective Action*. Cambridge, MA: Harvard Univ. Press
- Ornelas E. 2005. Trade creating free trade areas and the undermining of multilateralism. *Eur. Econ. Rev.* 49:1717–35
- Ornelas E. 2007. Exchanging market access at the outsiders' expense: the case of customs unions. *Can. J. Econ.* 40:207–24
- Ossa R. 2009. A 'new-trade' theory of GATT/WTO negotiations. Unpublished manuscript, Univ. Chicago
- Park JH. 2000. International trade agreements between countries of asymmetric size. *J. Int. Econ.* 50: 473–95
- Park JH. 2009. *Private trigger strategies in the presence of concealed trade barriers*. Unpublished manuscript, Seoul Natl. Univ.
- Petersmann E-U. 1997. *The GATT/WTO Dispute Settlement System: International Law, International Organizations and Dispute Settlement*. London: Kluwer Law Int.
- Prusa T, Skeath S. 2001. The economic and strategic motives for antidumping filings. *Rev. World Econ.* 138:389–413
- Regan DH. 2006. What are trade agreements for? Two conflicting stories told by economists, with a lesson for lawyers. *J. Int. Econ. Law* 9:951–88
- Rhodes C. 1993. *Reciprocity, U.S. Trade Policy, and the GATT Regime*. Ithaca, NY: Cornell Univ. Press
- Rose A. 2004. Do we really know that the WTO increases trade? *Am. Econ. Rev.* 94:98–114
- Saggi K. 2004. Tariffs and the most favored nation clause. *J. Int. Econ.* 63:341–68
- Schwartz WF, Sykes AO. 1997. The economics of the most-favored-nation clause. In *Economic Dimensions in International Law: Comparative and Empirical Perspectives*, ed. JS Bhandani, AO Sykes, pp. 43–79. Cambridge, UK: Cambridge Univ. Press
- Shirono K. 2004. *Are WTO tariff negotiations reciprocal? An analysis of tariff liberalization*. Unpublished manuscript, Columbia Univ.
- Spagnolo G. 2001. *Issue linkage, credible delegation, and policy cooperation*. CEPR Discuss. Pap. 2778
- Spamann H. 2006. The myth of 'rebalancing' retaliation in WTO dispute settlement practice. *J. Int. Econ. Law* 9:31–79
- Staiger RW. 2006. What can developing countries achieve in the WTO? *J. Econ. Lit.* 44:779–95
- Staiger RW, Sykes AO. 2009. *International trade and domestic regulation*. Unpublished manuscript, Stanford Univ.
- Staiger RW, Tabellini G. 1987. Discretionary trade policy and excessive protection. *Am. Econ. Rev.* 77:823–37
- Staiger RW, Tabellini G. 1999. Do GATT rules help governments make domestic commitments? *Econ. Polit.* 11:109–44
- Subramanian A, Wei S-J. 2007. The WTO promotes trade, strongly but unevenly. *J. Int. Econ.* 72:151–75

- Sykes AO. 2005. The economics of WTO rules on subsidies and countervailing measures. In *The World Trade Organization: Legal, Economic and Political Analysis*, Vol. II, ed. A Appleton, P Macrory, M Plummer, pp. 83–108. New York: Springer-Verlag
- Tang M-K, Wei S-J. 2010. The value of making commitments externally: evidence from WTO accessions. *J. Int. Econ.* In press
- Tasca HJ. 1938. *The Reciprocal Trade Policy of the United States: A Study in Trade Philosophy*. Philadelphia: Univ. Penn. Press
- Tomz M, Goldstein J, Rivers D. 2007. Do we really know that the WTO increases trade? Comment. *Am. Econ. Rev.* 97:2005–18
- Torrens R. 1844. *The Budget: On Commercial Policy and Colonial Policy*. London: Smith, Elder
- Venables A. 1985. Trade and trade policy with imperfect competition: the case of identical products and free entry. *J. Int. Econ.* 19:1–20
- Venables A. 1987. Trade and trade policy with differentiated products: a Chamberlinian-Ricardian model. *Econ. J.* 97:700–17
- Wallace BB. 1933. Tariff bargaining. *Foreign Aff.* 1933:621–33
- Winters LA, Chang W. 2000. Regional integration and the prices of imports: an empirical investigation. *J. Int. Econ.* 51:363–77
- Winters LA, Chang W. 2002. How regional blocs affect excluded countries: the price effects of Mercusor. *Am. Econ. Rev.* 92:889–904
- World Trade Organ. 2001. *Annual Report*. Geneva: World Trade Organ.
- World Trade Organ. 2002. Negotiations on improvements and clarifications of the dispute settlement understanding. Proposal by Mexico. Dispute settlement body, special sess. Nov. 4, catalogue record TN/DS/W/23
- World Trade Organ. Appell. Body. 2004. *United States Anti-Dumping Act of 1916* (original complaint by the European Communities): recourse to arbitration by the United States under Art. 22.6 of the DSU. Feb. 24, catalogue record WT/DS136/ARB
- Zissimos B. 2007. The GATT and gradualism. *J. Int. Econ.* 71:410–33



## Contents

Questions in Decision Theory <i>Itzhak Gilboa</i> . . . . .	1
Structural Estimation and Policy Evaluation in Developing Countries <i>Petra E. Todd and Kenneth I. Wolpin</i> . . . . .	21
Currency Unions in Prospect and Retrospect <i>J.M.C. Santos Silva and Silvana Tenreyro</i> . . . . .	51
Hypothesis Testing in Econometrics <i>Joseph P. Romano, Azeem M. Shaikh, and Michael Wolf</i> . . . . .	75
Recent Advances in the Empirics of Organizational Economics <i>Nicholas Bloom, Raffaella Sadun, and John Van Reenen</i> . . . . .	105
Regional Trade Agreements <i>Caroline Freund and Emanuel Ornelas</i> . . . . .	139
Partial Identification in Econometrics <i>Elie Tamer</i> . . . . .	167
Intergenerational Equity <i>Geir B. Asheim</i> . . . . .	197
The World Trade Organization: Theory and Practice <i>Kyle Bagwell and Robert W. Staiger</i> . . . . .	223
How (Not) to Do Decision Theory <i>Eddie Dekel and Barton L. Lipman</i> . . . . .	257
Health, Human Capital, and Development <i>Hoyt Bleakley</i> . . . . .	283
Beyond Testing: Empirical Models of Insurance Markets <i>Liran Einav, Amy Finkelstein, and Jonathan Levin</i> . . . . .	311
Inside Organizations: Pricing, Politics, and Path Dependence <i>Robert Gibbons</i> . . . . .	337

Identification of Dynamic Discrete Choice Models <i>Jaap H. Abbring</i> . . . . .	367
Microeconomics of Technological Adoption <i>Andrew D. Foster and Mark R. Rosenzweig</i> . . . . .	395
Heterogeneity, Selection, and Wealth Dynamics <i>Lawrence Blume and David Easley</i> . . . . .	425
Social Interactions <i>Steven N. Durlauf and Yannis M. Ioannides</i> . . . . .	451
The Consumption Response to Income Changes <i>Tullio Jappelli and Luigi Pistaferri</i> . . . . .	479
Financial Structure and Economic Welfare: Applied General Equilibrium Development Economics <i>Robert Townsend</i> . . . . .	507
Models of Growth and Firm Heterogeneity <i>Erzo G.J. Luttmer</i> . . . . .	547
Labor Market Models of Worker and Firm Heterogeneity <i>Rasmus Lentz and Dale T. Mortensen</i> . . . . .	577
The Changing Nature of Financial Intermediation and the Financial Crisis of 2007–2009 <i>Tobias Adrian and Hyun Song Shin</i> . . . . .	603
Competition and Productivity: A Review of Evidence <i>Thomas J. Holmes and James A. Schmitz, Jr.</i> . . . . .	619
Persuasion: Empirical Evidence <i>Stefano DellaVigna and Matthew Gentzkow</i> . . . . .	643
Commitment Devices <i>Gharad Bryan, Dean Karlan, and Scott Nelson</i> . . . . .	671

## Errata

An online log of corrections to *Annual Review of Economics* articles may be found at <http://econ.annualreviews.org>