Online Appendix For "Multilateral Trade Bargaining: A First Look at the GATT Bargaining Records"

Kyle Bagwell* Robert W. Staiger† Ali Yurukoglu‡

July 2020

*Department of Economics, Stanford University; and NBER.
†Department of Economics, Dartmouth College; and NBER.
‡Graduate School of Business, Stanford University and NBER

1. Introduction

In this Online Appendix we present in section 2 a basic modeling framework for interpreting tariff negotiations and in section 3 we introduce institutional detail in this basic modeling framework. Together these two sections provide a more extensive treatment of the material in section III of the body of the paper. We then present in sections 4 and 5 additional evidence on GATT Torquay Round tariff bargaining broken out by the UK and its Commonwealth partners (section 4) and by newcomers to the GATT (section 5). Throughout we refer to figures and tables that appear in this Appendix with the prefix A to distinguish them from the figures and tables that appear in the body of the paper. A final table, Table A4, provides Torquay Round summary statistics about bargaining activity and tariffs by country.

2. A Basic Framework for Interpreting Tariff Negotiations

It is not self-evident how one can make sense of even the most basic features of tariff bargaining. Why do trade negotiators view own-tariff cuts as "concessions" to be granted only in return for foreign tariff cuts for their exporters? What do governments have to gain from bargaining over tariffs anyway? And how can one account for the narrow focus of negotiations on tariff bargaining, when it is clear that trade flows can be impacted by a wide range of government policies? If a modeling framework is to serve as a foundation for interpreting the GATT tariff bargaining data, it should be capable of providing answers to at least these most basic questions.

In this section we sketch a basic modeling framework that highlights the terms-of-trade externality associated with unilateral tariff choices, and that yields answers to the questions posed above. More specifically, below we review the textbook two-good general-equilibrium model of trade between two countries, add to this a general family of government preferences, and use the resulting framework to answer these questions. We then briefly extend the framework to a multicountry setting in order to examine how interdependence across countries is shaped by the MFN principle. For these purposes we paraphrase the treatment in Bagwell and Staiger (2010a), and refer readers there for details. In the following section we then augment the basic framework developed here with additional institutional structure, and from the perspective of the resulting model predictions we then offer an interpretation of some of the hallmarks of GATT tariff bargaining as documented by the stylized facts of the GATT bargaining data that we present in the body of our paper.

A Model Two-Country World Economy Two countries, domestic (no *) and foreign (*), trade two goods which are normal in consumption and produced in perfectly competitive markets under conditions of increasing opportunity costs. 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 $p \equiv p_x/p_y$ ($p^* \equiv p_x^*/p_y^*$). Tariffs are non-prohibitive, and the domestic (foreign) ad valorem import tariff is 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. The foreign terms of trade is given by p^w, and the domestic terms of trade is $1/p^w$. We interpret $\tau > 1$ as an import tax and similarly for τ^*.

In each country, production levels for x and y are determined by the local relative price: $Q_i = Q_i(p)$ and $Q_i^* = Q_i^*(p^*)$ for $i = \{x, y\}$. Consumption is also influenced by the local relative price, which defines the trade-off faced by consumers and determines the level and distribution of factor income. Consumption depends as well on tariff revenue R (R^*), which is measured in units of the local export good at local prices and is distributed lump-sum to domestic (foreign) consumers. Domestic and foreign consumption thus may be represented as $D_i = D_i(p, R)$ and $D_i^* = D_i^*(p^*, R^*)$ for $i = \{x, y\}$. But tariff revenue is implicitly defined by $R = [D_x(p, R) - Q_x(p)][p - p^w]$ or $R = R(p, p^w)$ for the domestic country, and similarly we have that $R^* = [D_y^*(p^*, R^*) - Q_y^*(p^*)][1/p^* - 1/p^w]$ or $R^* = R^*(p^*, p^w)$ for the foreign country; and each country's tariff revenue increases with its terms of trade, given our assumption of normal goods. Hence, we may express national consumption as a function of local and world prices: $C_i(p, p^w) \equiv D_i(p, R(p, p^w))$ and $C_i^*(p^*, p^w) \equiv D_i^*(p^*, R^*(p^*, p^w))$ for $i = \{x, y\}$.

Imports of x and exports of y for the domestic country are respectively defined by $M(p, p^w) \equiv C_x(p, p^w) - Q_x(p)$ and $E(p, p^w) \equiv Q_y(p) - C_y(p, p^w)$. Likewise, for the foreign country, we have $M^*(p^*, p^w)$ and $E^*(p^*, p^w)$, respectively. For any prices, domestic and foreign budget constraints are represented by the trade-balance equations:

$$p^w M(p, p^w) = E(p, p^w), \text{ and } M^*(p^*, p^w) = p^w E^*(p^*, p^w). \tag{2.1}$$

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

$$E(p(\tau, \widetilde{p}^w), \widetilde{p}^w) = M^*(p^*(\tau^*, \widetilde{p}^w), \widetilde{p}^w), \tag{2.2}$$

where we make explicit in (2.2) the functional dependencies for local prices. Market clearing for good x is then guaranteed by (2.1) and (2.2).

We assume $dp/d\tau > 0 > dp^*/d\tau^*$ and $\partial\widetilde{p}^w/\partial\tau < 0 < \partial\widetilde{p}^w/\partial\tau^*$, thereby ruling out the Metzler and Lerner paradoxes, and with the final two inequalities indicating that each country is "large" (i.e., 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; by contrast, in the political-economy approach, governments are motivated by distributional concerns. Here, we follow Bagwell and Staiger (1999, 2002) and adopt a general approach to modeling government preferences, representing the objectives of the domestic and foreign governments with the general functions $W(p, \widetilde{p}^w)$ and $W^*(p^*, \widetilde{p}^w)$, respectively. We thus represent welfare in terms of the prices that the tariffs induce rather than directly in terms of the tariffs themselves. This approach enables us to disentangle the separate roles played by the terms-of-trade externality and political motivations in explaining what governments have to gain from bargaining over tariffs.

We place no restrictions on government preferences over local prices. With the level and distribution of factor incomes determined by local prices, we therefore accommodate a wide range of political motivations. We assume only that, holding its local price fixed, each government is pleased when its terms of trade improve:

$$W_{\widetilde{p}^w} < 0 \text{ and } W^*_{\widetilde{p}^w} > 0. \tag{2.3}$$

The meaning of (2.3) in terms of the underlying tariff changes is that a government values the international income transfer that is implied by an increase in its own tariff and a decrease in the tariff of its trading partner that together leave its local price unaltered. As Bagwell and Staiger (1999, 2002) discuss, governments maximize welfare functions of this form in both the traditional approach and in the leading political-economy approaches to trade policy.

Unilateral Policies To analyze optimal unilateral (non-cooperative) policies, we suppose 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

$$W_p + \lambda W_{\widetilde{p}^w} = 0, \text{ and} \tag{2.4}$$

$$W^*_{p^*} + \lambda^* W^*_{\widetilde{p}^w} = 0, \tag{2.5}$$

where $\lambda \equiv [\partial \widetilde{p}^w/\partial \tau]/[dp/d\tau] < 0$ and $\lambda^* \equiv [\partial \widetilde{p}^w/\partial \tau^*]/[dp^*/d\tau^*] < 0$. 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.[1]

The welfare implications of the local-price movement in the first term of (2.4) are domestic in nature: 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 second term of (2.4) are international in nature: they reflect the benefits to the domestic government of shifting some of the costs of its policy choice onto the foreign government. Cost shifting occurs, since any improvement in the domestic country's terms of trade is a deterioration in the foreign country's terms of trade. We may similarly interpret (2.5) for the foreign government.

In a Nash equilibrium, both governments are on their reaction curves, and a Nash equilibrium tariff pair (τ^N, τ^{*N}) thus satisfies (2.4) and (2.5). We take this equilibrium to represent the trade-policy decisions that governments would make if there were no trade agreement.

From the perspective of (2.4) and (2.5), we may now return to the first question posed above and observe that it is natural within this modeling framework that trade negotiators would view own-tariff cuts as "concessions" to be granted only in return for foreign tariff cuts for their exporters. First, beginning from (2.4) and (2.5), *any* own-tariff change would be viewed as a concession, given that governments begin from their best-response tariffs. And second, (2.4) implies $W_p < 0$ when the home government selects its best-response tariff. Hence, if the home government were to request a small foreign tariff cut for its exporters and offered as a concession a small tariff cut of its own that prevented the terms of trade $\widetilde{p}^w$ from changing, the proposed tariff changes would reduce p while leaving $\widetilde{p}^w$ unchanged and therefore deliver $-W_p > 0$, increasing the welfare of the home government. As (2.5) implies $W^*_{p^*} > 0$ when the foreign government selects its best-response tariff, an analogous observation applies for the foreign government.

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

[1] We assume throughout that the second-order conditions associated with any maximization problem hold globally.

equilibrium is inefficient, when efficiency is measured relative to government preferences.

Three observations can be stated.[2] First, Nash tariffs are indeed inefficient. Second, both governments can gain relative to Nash only if each agrees to set its tariff below its Nash level. The first observation means that a mutually beneficial trade agreement is possible, while the second observation implies that reciprocal trade liberalization is necessary for mutual gains. Intuitively, 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. The incentive to shift costs naturally leads governments to set tariffs that are higher than is efficient.

To see if the terms-of-trade externality is the only reason for the inefficiency of Nash tariffs, consider a hypothetical world in which governments are not motivated by the terms-of-trade implications of their unilateral trade-policy choices, that is, a hypothetical non-cooperative setting in which $W_{\widetilde{p}^w} \equiv 0$ and $W^*_{\widetilde{p}^w} \equiv 0$. Next define the "domestic politically optimal reaction curve" by $W_p = 0$, the "foreign politically optimal reaction curve" by $W^*_{p^*} = 0$, and the *politically optimal tariffs* as any tariff pair (τ^{PO}, τ^{*PO}) that satisfies the first-order conditions $W_p = 0$ and $W^*_{p^*} = 0$. The third observation is that politically optimal tariffs are efficient (when evaluated with actual government preferences): the terms-of-trade externality is the sole rationale for a trade agreement in this ("terms-of-trade theory") modeling framework. Put differently, according to this modeling framework and in answer to the second question posed above, the gains from tariff bargaining come from the ability to eliminate the inefficient terms-of-trade driven motives from unilateral tariff choices.

The politically optimal tariffs are not the only efficient tariffs. In the special case where governments maximize national welfare, efficient tariffs satisfy $\tau = 1/\tau^*$ (as Mayer, 1981 shows) and politically optimal tariffs correspond to reciprocal free trade (i.e., $\tau = \tau^* = 1$), a point on the Mayer locus. 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.

Finally, with terms-of-trade manipulation identified as the only source of policy inefficiency in the Nash equilibrium, it is a short step to the realization that, if the modeling framework is extended to include additional "behind-the-border" policies, in the Nash equilibrium only the

[2] Formal proofs of these observations can be found in Bagwell and Staiger (1999, 2002).

tariffs will be set inefficiently. This follows because tariffs are the first-best instrument for terms-of-trade manipulation, and so there is no need for governments to distort other policies for this purpose (see Bagwell and Staiger, 2001, 2002). This gives rise to the possibility that "shallow integration" trade agreements, which focus on tariff bargaining to achieve efficient levels of market access and are accompanied by a set of rules to prevent "back-door" protectionism through the introduction of new behind-the-border measures once tariffs are constrained by negotiation, can lead governments to the efficiency frontier.[3] Hence our modeling framework provides an answer to the third question posed above.

Interdependence in a Multilateral World We next consider briefly the interdependence across pairs of countries that arises in a multilateral world, and how the MFN principle shapes this interdependence. For this purpose we extend the modeling framework introduced above to a three-country setting, and once again paraphrase the treatment in Bagwell and Staiger (2010a), referring readers there for details.

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 τ^{*i}), while the domestic country can set tariffs on its imports of good x from the two foreign countries. If the domestic country applies the tariff τ^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 only be 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 $\tau^1 \neq \tau^2$.

The MFN rule imposes a very 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 these imports originate from foreign-country 1 or 2. An important implication of the MFN rule is then that a single equilibrium world price, $\widetilde{p}^w(\tau, \tau^{*1}, \tau^{*2})$, must prevail; consequently, we may continue to express government preferences with the simple representation $W(p, \widetilde{p}^w)$, $W^{*1}(p^{*1}, \widetilde{p}^w)$ and $W^{*2}(p^{*2}, \widetilde{p}^w)$, where $p = \tau p^w \equiv p(\tau, p^w)$ and $p^{*i} = p^w/\tau^{*i} \equiv p^{*i}(\tau^{*i}, p^w)$, $i = 1, 2$.

[3] For a recent review of the trade agreements literature, including the logic of shallow integration when viewed from the perspective of the terms-of-trade theory, see Bagwell, Bown and Staiger (2016).

In a multilateral world, the MFN principle therefore ensures that the international externality at the root of the problem to be solved by a trade agreement continues to exhibit the same structure as in the simpler 2-country setting. At the same time, as the equilibrium world price function $\widetilde{p}^w(\tau, \tau^{*1}, \tau^{*2})$ indicates, in general each county's welfare will be impacted by the tariff choices of the remaining two countries if these tariff choices impact the world price. Bilateral MFN tariff bargains will therefore in general impose externalities on third countries, pointing to a potentially important multilateral dimension associated with such bargains.[4] Put differently, according to our modeling framework a collection of bilateral MFN tariff bargains would represent a setting of bilateral bargaining with externalities, which is well-known to be in general a complex bargaining environment.[5]

3. Interpreting Tariff Bargaining at Torquay

Our examination of the Torquay Round bargaining records yields a set of stylized facts presented in the body of our paper that can help guide modeling efforts aimed at settings characterized by bilateral bargaining with externalities. These stylized facts that lend support to two features that are seen by GATT practitioners and legal scholars as hallmarks of the tariff bargaining that occurred in the early GATT rounds. A first feature is the surprising lack of strategic behaviors such as lowball initial offers among the participating governments. A second feature is the presence of an important multilateral element to the bilateral bargains.

We begin by presenting summary statistics about each nation's bargaining activity in Table A4. This table describes the movement in tariffs for each country for products whose tariffs were lowered as part of an agreement. We also present what fraction of goods which had request or offer activity ended up with a tariff reduction in the final agreement.

Surveying the bargaining techniques used by countries over the first 5 GATT rounds of request-offer tariff negotiations, Curzon (1966) comments on the lack of strategic behavior among GATT contracting parties:

> ...Their requests cannot be higher than their offers and negotiations start from this

[4] In the absence of MFN, there would also be potentially important multilateral dimensions associated with any bilateral (discriminatory) tariff bargain, but the spillovers would be different (see, for example, Bagwell and Staiger, 2005).

[5] On the complexity of bilateral bargaining with externalities, see Cremer and Riordan (1987), Horn and Wolinsky (1988), McAfee and Schwartz (1994) and Hart and Tirole (1990), and see Bagwell, Staiger and Yurukoglu (2017) in the context of bilateral tariff bargaining under weaker rules than those considered here.

> maximum position: if all requests are granted all the offers will be fulfilled. Similarly all other contracting parties are likely to make offers which match the requests they have made. As some of the requests are rejected, some of the offers are withdrawn. This procedure has been raised to a Gatt principle and is not laid down by any rule. It is a convention but one which creates a much better negotiating climate than the opposite trend which was a feature of the classical bilateral negotiations. Then, everyone put forward very low offers with the intention of increasing gradually if the bargaining proved profitable. A country never knew, however, when it had reached the maximum its partner was willing to concede. (p. 74)

The lack of strategic behavior described by Curzon is supported by our findings that offers of tariff cuts for given import products were rarely deepened, with countries "shopping around" their initial tariff-cut offers over the course of the negotiations (Stylized Fact 2(i)); and that once the initial proposals were on the table the focus of bargaining narrowed to each country's own-tariff-cut offers, and countries responded to imbalances in the outstanding offers by adjusting their own offers rather than reissuing or modifying the tariff-cut requests they were making of their bargaining partners, with relatively small numbers of back-and-forth offers in any bilateral bargain (Stylized Fact 1).

And while GATT tariff negotiations occurred bilaterally, GATT practitioners place great emphasis on the role that GATT played in allowing countries to relax their need for strict bilateral reciprocity ("balance") in negotiations and focus instead on achieving reciprocity on a multilateral basis. As one early GATT report put it (see also Curzon, 1966, pp. 75-77):

> Multilateral tariff bargaining, as devised at the London Session of the Preparatory Committee in October 1946 and as worked out in practice at Geneva and Annecy, is one of the most remarkable developments in economic relations between nations that has occurred in our time. It has produced a technique whereby governments, in determining the concessions they are prepared to offer, are able to take into account the indirect benefits they may expect to gain as a result of simultaneous negotiations between other countries, and whereby world tariffs may be scaled down within a remarkably short time. ... The multilateral character of the Agreement enabled the negotiators to offer more extensive concessions than they might have been prepared to grant if the concessions were to be incorporated in separate bilateral agreements. Before the Geneva negotiations

> a country would have aimed at striking a balance between the concessions granted to another country and the direct concessions obtained from it without taking into account indirect benefits which might accrue from other prospective trade agreements; it might even have been unwilling to grant an important concession if it had been obliged to extend that concession to third countries without compensation. (ICITO, 1949, p. 10)

In effect, the ICITO report claims that GATT rounds made it possible for governments to *exchange* externalities across bilaterals in a balanced way that allowed them to maintain multilateral reciprocity. An important multilateral element to the bilateral bargains is suggested by our finding that for some bargains the initial offers sit dormant for long periods of time and are then finalized with a single modification at the time that other bargains are concluded, with some agreements themselves also modified at the conclusion of the round (Stylized Fact 3).

In this section we augment the basic framework developed in section 2 with additional institutional structure, and through this lens we suggest an interpretation of the core bargaining features emphasized above. In particular, we argue that these core features are broadly consistent with what would be expected according to our framework, if governments make dominant-strategy proposals that adhere strictly to the twin institutional constraints of MFN and multilateral reciprocity.[6]

3.1. Tariff Bargaining under Reciprocity and MFN

Reciprocity and MFN are widely viewed as pillars of the GATT/WTO architecture. Here we focus on the implications of reciprocity and MFN for tariff bargaining and thus the GATT bargaining data, and we show that these institutional constraints can dramatically simplify the tariff bargaining problem. First, building on the two-country model in section 2, we describe how strict adherence to reciprocity simplifies strategic considerations and results in a dominant bargaining strategy. Second, building on the multi-country version of the model in section 2, we confirm as well that strict adherence to reciprocity and MFN neutralizes third-party externalities. Finally, we examine the relationship between bilateral and multilateral reciprocity when MFN is satisfied, and we explain that dominant bargaining strategies again arise in the multi-country context under strict adherence to multilateral reciprocity and MFN. As in the two-country model, we also point out a potential cost: if GATT bargaining partners are

[6] Bagwell and Staiger (2018) develop the formal foundations for this view.

asymmetric in a sense described below, then strict adherence to multilateral reciprocity and MFN also prevents governments from reaching the efficiency frontier.

Reciprocity We start with a review of the basic properties of reciprocity. For this purpose we again paraphrase the treatment in Bagwell and Staiger (2010a), and refer readers there for details. The GATT/WTO principle of reciprocity refers to the ideal of mutual changes in trade policy which bring about changes in the volume of each country's imports that are equal in magnitude to the changes in the volume of its exports. The notion of reciprocity arises in two places in GATT. First, as we noted in section 2 of our paper, governments seek a "balance of concessions" as a norm of negotiations, 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 partners. Second, when a government seeks to renegotiate, modify or withdraw a previous concession as an original action, GATT Article XXVIII permits affected trading partners to withdraw "substantially equivalent concessions," and thereby to retaliate in a reciprocal manner. Hence, GATT's reciprocity principle describes a fixed terms-of-exchange rule (applied to increases and decreases) for negotiated market access, and fixes the terms of exchange at one-for-one.[7]

Continuing with the two-country model developed in section 2, we now state a formal definition of reciprocity. Suppose that, beginning from an initial pair of tariffs, (τ^0, τ^{*0}), a tariff negotiation results in a change to a new pair of tariffs, (τ^1, τ^{*1}). Denoting the initial world and domestic local prices as $\widetilde{p}^{w0} \equiv \widetilde{p}^{w}(\tau^0, \tau^{*0})$ and $p^0 \equiv p(\tau^0, \widetilde{p}^{w0})$, and the new world and domestic local prices as $\widetilde{p}^{w1} \equiv \widetilde{p}^{w}(\tau^1, \tau^{*1})$ and $p^1 \equiv p(\tau^1, \widetilde{p}^{w1})$, we say that the tariff changes conform to *the principle of reciprocity* provided that

$$\widetilde{p}^{w0}[M(p^1, \widetilde{p}^{w1}) - M(p^0, \widetilde{p}^{w0})] = [E(p^1, \widetilde{p}^{w1}) - E(p^0, \widetilde{p}^{w0})], \tag{3.1}$$

where changes in trade volumes are valued at the existing world price. We next use the domestic balanced trade condition in (2.1) to establish that (3.1) may be rewritten as

$$[\widetilde{p}^{w1} - \widetilde{p}^{w0}]M(p^1, \widetilde{p}^{w1}) = 0. \tag{3.2}$$

[7] The adding-up constraint imposed by market clearing makes a one-for-one terms of exchange inevitable as long as governments are committed to adopting a common terms of exchange for market access applied uniformly across all governments. See Bagwell and Staiger (2016) for elaboration on this point. We note also that the application of GATT's reciprocity principle in circumstances where a government modifies or withdraws a previous concession extends beyond Article XXVIII to include the case of temporary safeguard measures under GATT Article XIX and responses to nullification or impairment under GATT Article XXIII. For shorthand we continue to refer only to GATT Article XXVIII in the text.

According to (3.2), 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 next consider how strict adherence to reciprocity simplifies the complexity of the bargaining problem.

We examine an illustrative model. Let us take the pre-negotiation tariff pair as exogenous, with the Nash tariffs being the natural candidate. The initial tariff pair fixes a particular iso-world-price line, where as we illustrate below any such line is upward sloping in a graph with tariffs on the axes. Following Bagwell and Staiger (1999), governments simultaneously make tariff proposals, where any such proposal conforms to reciprocity and thus specifies a tariff pair (τ, τ^*) that lies along the fixed iso-world-price line. If the proposals agree, then the common proposal is implemented; otherwise, the proposal with the higher tariff pair (i.e., the lowest trade volume) is implemented. This model clearly captures the reciprocal nature of tariff liberalization negotiations in GATT; in addition, the structure of the game captures in a short-hand way the potential for renegotiation under GATT Article XXVIII, since neither government can be forced to import a volume greater than implied by its proposal.[8]

As established by Bagwell and Staiger (1999), strict adherence to reciprocity ensures that it is a dominant strategy for each government to propose the tariff pair that if implemented would deliver its preferred trade volume along the given iso-world-price line. Indeed, once the iso-world-price line is fixed, this conclusion holds whether or not a government has private information about its preferred local price. In this sense, strict adherence to reciprocity can induce governments to truthfully reveal their "politically optimal reaction curves" (as defined in section 2). The key features of the argument are illustrated in Figure A1 (which is an adaptation of Figure 4 in Bagwell and Staiger, 1999).

In the symmetric case, defined as when the Nash trade war leaves countries facing the same terms of trade as would prevail at their politically optimal tariffs, strict adherence to reciprocity leads to an efficient outcome. To develop this point, we refer to Figure A1, which depicts τ on

[8]Under GATT Article XXVIII, if a negotiated tariff pair induces more trade volume than one government desires given the world price, then that government could raise its tariff, knowing that the other government would respond in reciprocal fashion. Our model captures this possibility in a short-hand way, by assuming that the proposal with the highest tariff pair is ultimately implemented. For more on the trade-effects interpretation of reciprocity in GATT/WTO practice in line with our discussion above, see Hoda (2001) and the Appellate Body Opinion in WTO (2004). Limao (2006, 2007) and Karacaovali and Limao (2008) provide empirical evidence that actual tariff bargaining outcomes in the GATT/WTO conform to a reciprocity norm. See also US International Chamber of Commerce (1955) for particular evidence on the importance of the reciprocity norm for the results of the Torquay Round.

the vertical axis and τ^* on the horizontal axis.

The symmetric case is illustrated by the Nash point labeled N(C), which lies on the same iso-world-price locus as does the politically optimal point, which is labeled PO and lies below N(C). In Figure A1 we label as $p_N^w(C) = p_{PO}^w$ the iso-world-price locus passing through both N(C) and PO. As reciprocity fixes the world price, the two governments bargain along the iso-world-price locus $p_N^w(C) = p_{PO}^w$. The only dimension on which the governments negotiate is the volume of trade to be exchanged at the fixed world price (and trade volume is increasing as we move downward along the locus $p_N^w(C) = p_{PO}^w$). At this fixed world price, the domestic government's desired trade volume is determined where its politically optimal reaction curve (labeled as $W_p = 0$) intersects the iso-world-price locus $p_N^w(C) = p_{PO}^w$; and similarly the foreign government's desired trade volume is determined where its politically optimal reaction curve (labeled as $W_{p^*}^* = 0$) intersects the iso-world-price locus $p_N^w(C) = p_{PO}^w$. In the symmetric case, these two points of intersection correspond to the single point which defines the political optimum (the point PO). Hence, according to Figure A1, the governments would agree on the desired volume of trade. Since it is a dominant strategy for each government in our game to propose the tariff pair that delivers its desired trade volume (i.e., to truthfully reveal its politically optimal reaction curve), the outcome of the bargaining game is the politically optimal tariff pair. Thus, in the symmetric case, strict adherence to reciprocity ensures that the bargaining outcome yields an efficient outcome corresponding to the political optimum.

Now consider an asymmetric environment. Let us begin with point N(A). As in the symmetric case, the fact that reciprocity fixes the world price implies that the two governments bargain along the iso-world-price locus passing through N(A), which we label $p_N^w(A)$. At this fixed world price, the domestic government's desired trade volume is determined where its politically optimal reaction curve $W_p = 0$ intersects the iso-world-price locus $p_N^w(A)$; and similarly the foreign government's desired trade volume is determined where its politically optimal reaction curve $W_{p^*}^* = 0$ intersects the iso-world-price locus $p_N^w(A)$. But the two governments no longer agree on the desired volume of trade; the foreign government's desired trade volume (labeled as $A^{'}$) is less than the desired trade volume of the domestic government (labeled $A^{''}$). In practice, this is where Article XXVIII comes in: any bargain that leaves the governments on a point along the iso-world-price locus $p_N^w(A)$ and which is below $A^{'}$ will be renegotiated at the request of the foreign government up to the point $A^{'}$. In terms of our game, it is a dominant strategy for each government to propose the tariff pair that delivers its desired trade volume (i.e., to truthfully

reveal its politically optimal reaction curve), and so the outcome of the bargaining process is the point A'. If GATT bargaining partners are asymmetric in the sense that we have described above, then the strict adherence to reciprocity that is necessary for this result will itself prevent governments from reaching the efficiency frontier (labeled EE in Figure A1).[9]

Reciprocity with MFN We next consider MFN, and describe how reciprocity and MFN together can neutralize bargaining externalities across bargaining pairs. To develop this point, we build on the three-country version of the model in section 2. For this purpose we once again paraphrase the treatment in Bagwell and Staiger (2010a), and refer readers there for details.

Consider the case where 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 tariffs τ and τ^{*1} which leaves the terms of trade $\widetilde{p}^w(\tau, \tau^{*1}, \tau^{*2})$ unaltered but reduces p while raising p^{*1}, and which therefore provides these two countries with greater trade volume. But recall now that in foreign-country 2 we have the relationship $p^{*2} = p^w/\tau^{*2}$. It follows that, with τ^{*2} held fixed, if the negotiation between the domestic country and foreign-country 1 abides by MFN (so that a single equilibrium world price $\widetilde{p}^w$ prevails) and reciprocity (so that $\widetilde{p}^w$ is unaltered) then p^{*2} and therefore $W^{*2}(p^{*2}, \widetilde{p}^w)$ and foreign-country 2's trade volume are unaltered by these negotiations as well. In abiding by the principles of MFN and reciprocity, the domestic government and the government of foreign-country 1 have thus engineered a bilateral tariff bargain without third-country spillovers.[10]

Intuitively, the reciprocity principle balances two opposing third-party externalities that are present in bilateral MFN tariff bargaining: a *negative* externality on third parties arises when foreign-country 1 cuts its tariff on imports of good y in a bilateral bargain with the home country, and the externality is transmitted to competing importers of good y (foreign-country 2); at the same time, a *positive* third-party externality arises when the home country cuts its tariff on imports of good x in a bilateral bargain with foreign-country 1 and is transmitted to

[9] Indeed, as the discussion in US International Chamber of Commerce (1955, p. 33) well illustrates, the issue of asymmetries between "high-tariff" and "low-tariff" countries was increasingly emphasized as an impediment to further negotiations with each passing GATT round. If governments have private information about their political preferences, then similar conclusions hold with respect to the ex post efficiency of bargaining outcomes, where the symmetric case then corresponds to the situation in which the pre-negotiation tariff pair lies along the same iso-welfare-price line as the ex post politically optimal tariffs.

[10] These and related points are developed in Bagwell and Staiger (2005, 2010b).

competing exporters of good x (foreign-country 2). If the home country and foreign-country 1 engage in a bilateral MFN tariff bargain that cuts the tariff of foreign-country 1 and the tariff of the home country in a way that just *balances* these two opposing third-party externalities, they can then neutralize the third-party externality of their bilateral tariff bargain. This balance is precisely what GATT's principle of reciprocity achieves in a multi-country MFN world. In this general manner, reciprocity and MFN together can neutralize bargaining externalities across bargaining pairs.[11]

Multilateral Reciprocity We now illustrate and examine the distinction between bilateral and multilateral reciprocity. As we noted above and describe further in section 6 of our paper, this distinction was emphasized in GATT writings at the time of the early rounds. After defining and illustrating multilateral reciprocity, we specify a multilateral bargaining setting and argue that each country again proposes for itself a tariff that corresponds to its politically-optimal-reaction-curve tariff when countries use dominant strategies, provided that tariff proposals satisfy MFN as well as *multilateral* - but not necessarily *bilateral* - reciprocity.[12]

We begin by illustrating how bilateral reciprocity could fail and yet multilateral reciprocity could hold. For this purpose we consider a four-country extension – the domestic country and three foreign trading partners $*1$, $*2$ and $*3$ – of the model described in section 2. In line with our earlier discussion, we assume that the equilibrium world price is decreasing in the domestic-country tariff and increasing in each of the foreign-country tariffs: $\widetilde{p}^w \equiv \widetilde{p}^w(\overset{(-)}{\tau}, \overset{(+)}{\tau^{*1}}, \overset{(+)}{\tau^{*2}}, \overset{(+)}{\tau^{*3}})$. Suppose that the domestic country were to engage in a bilateral bargain with foreign-country 1 and foreign-country 2 but not with foreign-country 3, and suppose further that in combination the agreed changes to τ, τ^{*1} and τ^{*2} preserve the world price at its initial level. Then foreign-country 3 would be unaffected by these two bilaterals taken together – and thus together these bilaterals do not give rise to a free-rider problem with respect to foreign-country 3 – whether the domestic country "splits" its tariff cut across the two bilaterals in a way that matches their tariff cuts and maintains *bilateral reciprocity* in each bilateral bargain, or rather allocates

[11] We have described our results above in a simple 2-good model, and it remains to demonstrate that they extend to a many-good setting of the kind that would more accurately describe the GATT bargaining environment. An added benefit of the many-good extension is that it would allow an investigation into whether Stylized Fact 2(ii) could be understood from this perspective. We believe that the key features can be extended to such environments along the lines of Bagwell and Staiger (2002, Appendix B), but this extension remains an important task for future research.

[12] As we discuss below, our discussion here draws on formal analysis found in Bagwell and Staiger (2018).

its tariff cut unevenly across the two bilaterals in a way that violates bilateral reciprocity with each bargaining partner but nevertheless satisfies *multilateral reciprocity* and hence preserves the world price once all of the agreed tariff changes in the two bilaterals are viewed in combination.[13] Either way, each of foreign-country 1 and foreign-country 2 then experiences an equal increase in the volume of its exports and imports once it takes account of the indirect trade effects associated with the tariff changes negotiated in the other bilateral.

Bagwell and Staiger (2018) provide a formal analysis of dominant-strategy arguments in the multi-country setting. For a three-country general equilibrium model (with one domestic country and two foreign countries), they consider a game in which the three countries take as given the initial tariff vector and the accompanying world price, and then make simultaneous tariff proposals. A strategy for each country is a proposal concerning its own tariff and that of its trading partner(s), where a proposal must satisfy MFN and multilateral reciprocity (i.e., if accepted, the proposed tariffs would maintain the initial world price). Since the foreign countries do not trade with one another, a proposal from a foreign country leaves the tariff of the other foreign country at its initial value. As in the two-country model above, each country's proposal is associated with an "implied import volume" for itself. Bagwell and Staiger then construct a simple mechanism that takes the three proposals and assigns a vector of tariffs. The tariff vector comprised of each country's own-tariff proposal is assigned if the proposals agree.[14] If the proposals do not agree, the constructed mechanism assigns a vector of tariffs that maximizes the value of trade volume subject to maintaining the initial world price and not forcing any country to import a volume in excess of its implied import volume.[15]

[13] As Beckett (1941, p. 23) describes, a so-called "split concession" procedure analogous to what we describe in the text was often utilized by the US in order to maintain bilateral reciprocity in its sequential bilateral tariff bargains under the Reciprocal Trade Agreements Act that predated GATT.

[14] Specifically, agreement occurs when the tariff vector constructed from each country's proposal for its own tariff maintains the initial world price. Each country would then regard this "agreement tariff" as equivalent to its proposed tariff vector.

[15] This requirement delivers a unique tariff vector assignment when the value of the domestic country's implied import volume weakly exceeds the aggregate value of the foreign countries' implied import volumes. If the domestic country is on the "short" side, rationing occurs, and this requirement does not result in a unique tariff vector assignment. For this case, Bagwell and Staiger (2018) construct the mechanism so that it randomly selects one foreign country to have first priority. The constructed mechanism assigns tariffs such that the prioritized foreign country imports a volume equal to the minimum of its implied import volume and the value of the domestic country's implied import volume, while the other foreign country imports a volume equal to the difference between the value of the domestic country's implied import volume and the prioritized foreign country's implied import volume (if that difference is positive). Similar results would obtain under other prioritization rules, including rules that give priority to a principal supplier, provided that priority is not influenced by foreign proposals (conditional on being in the case where the domestic country is short).

For the constructed mechanism, if countries use dominant strategies, Bagwell and Staiger (2018) show that each country's proposal must specify a tariff for itself that delivers its preferred trade volume, given the initial world price. As the four-country illustration above suggests, a novel feature of the multi-country setting is that the domestic country now has a *set* of dominant strategies. This set is defined by proposals under which the domestic country proposes for itself the tariff that delivers its preferred trade volume given the world price and proposes for the foreign countries any tariffs that when combined with the domestic tariff maintain the world price and thus ensure multilateral reciprocity. Importantly, the set of dominant strategies for the domestic country allows that its proposed tariff for itself may violate bilateral reciprocity when paired with its proposed tariff for an individual foreign country. Finally, and as with two countries, once the world price is fixed, dominant strategy proposals are similarly characterized even when governments have private information about their respective preferences.

In line with the two-country results described above, Bagwell and Staiger (2018) show that, under dominant strategy proposals, the implemented tariff vector is efficient if and only if the initial world price is set at the politically optimal level. Thus, if the initial tariff vector is the Nash tariff vector under an MFN constraint, then the implemented tariff vector is efficient if and only if the domestic and foreign countries are symmetric in the sense that the Nash and politically optimal world prices are equal under the MFN constraint.

The basic arguments apply as well in a four-country setting, where foreign-country 3 does not participate in the negotiations. Here, when negotiations must satisfy MFN and multilateral reciprocity, (i) if the domestic country and foreign-countries 1 and 2 use dominant strategies, then each makes a proposal that specifies its politically-optimal-reaction-curve tariff for itself, and (ii) foreign-country 3 will be unaffected by the bilaterals (and there can be no free rider problems as a result).

Hence, when negotiations must satisfy MFN and multilateral reciprocity, non-participants will be unaffected by the negotiations and it is a dominant strategy for each participating government to propose for a given import product the tariff that generated its preferred trade volume for a fixed terms of trade. Under MFN and multilateral reciprocity, a government anticipates that any subsequent "rebalancing" of offers necessary for multilateral reciprocity would arise later in the round after all offers had been recorded and that this might lead to a reduction in the depth of its overall (multilateral) offer.[16]

[16] While we do not attempt structural estimation of a bargaining model in our paper, it is nevertheless

4. The UK and its Commonwealth Partners

We have shown above how MFN and reciprocity together can neutralize bargaining externalities across bargaining pairs, and we have argued that these institutional constraints can help account for core features of the Torquay bargaining records. And most of the tariff bargains in the Torquay Round conformed to the MFN principle. But there were exceptions. In particular, the UK and its Commonwealth partner countries negotiating at Torquay granted tariff preferences to each other on a range of selected products, and hence represent an important deviation from MFN; yet as a group these countries exhibited bargaining behaviors at Torquay which were not atypical with respect to the stylized facts we have described.[17] Here we argue that the positive (though not the normative) features of our dominant-strategy arguments above extend to the case where some countries grant tariff preferences to other countries, provided that those preference margins are preserved by any proposals made in the bilateral MFN tariff negotiations. We then present evidence that Commonwealth countries did indeed propose to reduce their preferential tariff rates whenever they proposed to reduce their MFN tariff rates at Torquay in a way that essentially preserved the preference margins they granted to their Commonwealth partner countries.

We first note that this behavior was explicitly permitted (though not required) at Torquay, as described in the following excerpt from Torquay bargaining protocol (see Hoda, 2001, pp 191-192):

> ...(c) In negotiations relating to any specific product with respect to which a preference applies: (i) when a reduction is negotiated only in the most-favoured-nation rate, such reduction shall operate automatically to reduce or eliminate the margin of preference applicable to that product; (ii) when a reduction is negotiated only in the preferential rate, the most-favoured-nation rate shall automatically be reduced to the extent of such reduction; (iii) when it is agreed that reductions will be negotiated in both the most-

useful to point out that the mechanism characterized by Bagwell and Staiger (2018) can generate outcomes consistent with no offer modification (when countries are symmetric) or one offer modification (when countries are asymmetric). If the framework were extended to allow for shocks (e.g., a given bilateral randomly fails), then the corresponding outcomes would be consistent with two or more offer modifications that require countries to switch to other strategies within their sets of dominant strategies.

[17] The Benelux countries were also members of a preferential trade agreement. But unlike the Commonwealth countries, theirs was a customs union, and following arguments similar to those in Bagwell and Staiger (1999, 2001) it can be shown that the dominant strategy arguments we describe above go through without modification in the presence of a customs union.

> favoured-nation rate and the preferential rate, the reduction in each shall be that agreed by the parties to the negotiations; and (iv) no margin of preference shall be increased.

As the Torquay protocol specifies, proposals of MFN tariff cuts accompanied by preferential tariff cuts that preserve the margin of preference would be covered by (ii), and by (iii) and (iv), in the excerpted passage above.

We next return to our three-country model and suppose that the domestic country initially imposes an MFN tariff t_0^{MFN} on imports from foreign-country 1 and a preferential tariff $t_0^{PREF} < t_0^{MFN}$ on imports from foreign-country 2, implying an initial MFN world price $\widetilde{p}_0^{wMFN}$ for trade between the domestic country and foreign-country 1 and a preferential world price $\widetilde{p}_0^{wPREF}$ for trade between the domestic country and foreign-country 2. The key point is that, as long as t^{MFN} and t^{PREF} are non-prohibitive, we have $p = \tau^{MFN}\widetilde{p}^{wMFN} = \tau^{PREF}\widetilde{p}^{wPREF}$ and hence

$$\widetilde{p}^{wPREF} = \frac{\tau^{MFN}}{\tau^{PREF}}\widetilde{p}^{wMFN} \tag{4.1}$$

where $\tau^{PREF} = (1 + t^{PREF})$ and $\tau^{MFN} = (1 + t^{MFN})$, implying that the relationship between $\widetilde{p}^{wMFN}$ and $\widetilde{p}^{wPREF}$ is pinned down by the margin of preference $[1 - \frac{\tau^{PREF}}{\tau^{MFN}}]$.[18]

Consider now the following bilateral tariff agreement between the domestic country and foreign-country 1. Suppose that the domestic country agrees to cut its MFN tariff from t_0^{MFN} to $t_1^{MFN} < t_0^{MFN}$ but also to cut its preferential tariff from t_0^{PREF} to t_1^{PREF} according to $\frac{\tau_1^{PREF}}{\tau_0^{PREF}} = \frac{\tau_1^{MFN}}{\tau_0^{MFN}}$. This would leave the margin of preference between the domestic country and foreign-country 2, $[1 - \frac{\tau_1^{PREF}}{\tau_1^{MFN}}]$, unchanged at its initial level $[1 - \frac{\tau_0^{PREF}}{\tau_0^{MFN}}]$. If in addition foreign-country 1 agrees to a reciprocal tariff cut of its own that holds $\widetilde{p}^{wMFN}$ fixed, then by (4.1) $\widetilde{p}^{wPREF}$ would also be held fixed, and the bargaining externality on foreign-country 2 – the preferential trade partner of the domestic country – would be neutralized, just as in the case of a bilateral tariff bargain that satisfies reciprocity in a world where all countries conform to MFN. From here, it is a short step to see that the positive features of our dominant-strategy arguments above extend to the case where the domestic country has preferential trading relationships as long as the domestic country ensures an unchanged margin of preference for its preferential trading partner(s) under any proposals made in its reciprocal MFN tariff bargains.[19]

[18] In the case of specific tariffs t^{MFN} and t^{PREF}, the margin of preference is defined as $[t^{MFN} - t^{PREF}]$.

[19] The normative features of our arguments above, namely, that bilateral bargaining subject to reciprocity will deliver efficient tariff outcomes in the symmetric case, are not preserved in the absence of MFN even if preference margins are preserved by the bargain, because the political optimum is not efficient in the absence of MFN (see Bagwell and Staiger, 2002).

Table A1 presents evidence that Commonwealth countries did indeed offer to reduce their preferential tariff rates whenever they offered to reduce their MFN tariff rates at Torquay in a way that essentially preserved the preference margins they offered their Commonwealth partner countries. Each row of Table A1 corresponds to a Commonwealth country who, in its bilateral tariff bargains at Torquay, offered MFN tariff cuts on products for which it granted preferential tariff access to its Commonwealth partners. There were three such countries: the UK, Australia and New Zealand. The first column of Table A1 records the existing ad valorem and specific preference margins (averaged over the products on which a tariff preference exists), the second column records the proposed ad valorem and specific preference margin implied by the proposed MFN and preferential tariff offers, and the third column records the proposed change in ad valorem and specific preference margins. As Table A1 reveals, the proposals at Torquay were constructed in a way that essentially preserved the existing margins of tariff preferences for Commonwealth countries, in line with what would be needed for our dominant-strategy arguments to extend to this environment. Focusing for example on the ad valorem preference margins, Table A1 (which reports 1 plus the ad valorem margin) indicates that, going into Torquay, the average preference margin offered by the UK to its Commonwealth partners on goods for which it offered a preferences was 9.1%, and its Torquay offers would have resulted in an average preference margin of 7.7%. Similarly, the average preference margin offered by Australia to its Commonwealth partners going into Torquay was 20.0%, and its Torquay offers would have resulted in an average preference margin of 18.0%. And for New Zealand, the analogous numbers are 18.8% and 17.2%.[20,21]

[20] Ultimately, the US-UK, US-Australia and US-New Zealand bilaterals broke down, and the official ICITO (1952) report describes the reasons for these breakdowns as follows: "... Substantial cuts in the tariffs of these Commonwealth countries, however, would inevitably have involved substantial reductions in some of the margins of preference which they accord to one another and the Commonwealth negotiators were not prepared to agree to major tariff concessions of this kind at the price which the United States negotiators were prepared to offer in return." (p. 9). The evidence that we present in Table A1 is consistent with the view stated by the ICITO that, in their bilaterals with the US, the Commonwealth countries were not willing to offer significant reductions in their preference margins given the price that the US was offering in exchange.

[21] It is also interesting to point out that our findings here – that, for Commonwealth countries, reducing an MFN tariff leads to a similar reduction in the preferential tariff – echo the findings of Estevadeordal, Freund and Ornelas (2008), who find a high correlation between preferential and MFN tariffs within Latin American preferential trade agreements. However, while they argue that the direction of causation is from preferential tariffs to MFN tariffs, in our case it is clear that causality runs in the other direction.

5. Newcomers to GATT

The Torquay Round was the third GATT round of tariff negotiations, following on the heels of the Geneva (1947) and Annecy (1949) rounds. And as an early GATT report describes (ICITO, 1949, p. 10), the bargaining at Torquay proceeded according to a "new technique" that had been "devised at the London Session of the Preparatory Committee in October 1946" and "worked out in practice at Geneva and Annecy." But six of the 37 parties negotiating at Torquay were newcomers to GATT and were negotiating their accession there, raising the possibility that, owing to their lack of experience with the GATT bargaining forum, these countries may have adopted different bargaining techniques when they arrived at Torquay than those countries that had been present in Geneva and/or Annecy. Curzon (1966) describes the negotiating experience of several GATT newcomers this way:

> Several newcomers to GATT unaware of this new technique and starting with low offers found that in the course of negotiations they were unable to reach the level of requests they aimed for. Their initially low offers were taken as proof of their intentions and they either had to go home with a tariff higher than expected or had to increase their offers in the course of the negotiations. Others who arrived with inadequate offers or too high a tariff found that these were not accepted and then either had to reduce tariffs unilaterally or to wait until the next round. (p. 74)

Did the newcomers at Torquay conform to the broader GATT convention of non-strategic behavior that our earlier quote from Curzon describes, and that is supported by Stylized Fact 2(i) (offers of tariff cuts for given import products were rarely deepened over the course of the negotiations) and Stylized Fact 1 (once the initial proposals were on the table countries responded to imbalances in the outstanding offers by adjusting their own offers rather than by adjusting their requests)? Or did the newcomers instead arrive at Torquay prepared to behave in a more traditionally strategic manner, as the Curzon quote just above suggests?

Tables A2 and A3 provide evidence on this question from the perspective of Stylized Fact 2(i), by reporting the statistics in Table 2 split into two sub-samples. Table A2 presents data for the subsample of the countries acceding to GATT at Torquay (Austria, Germany, Korea, Peru, Philippines and Turkey), while Table A3 presents data for the subsample of non-acceding countries (i.e., existing GATT member) at Torquay. As with Table 3, the top three rows of

Tables A2 and A3 report Sales (own tariff) and Purchases (bargaining partner tariff) statistics by product-negotiating partner pairs, and describe the evolution of tariff concessions from initial requests to finalized agreed concession, all normalized relative to the pre-existing tariff. And the bottom three rows report analogous own-tariff statistics, but as with Table 3 these rows focus only on the sellers of market access and do not condition on the country making the request of or receiving the offer from the seller. These rows describe the evolution of tariff concessions from initial requests to the last offer made (regardless of whether the tariff offer made it into a finalized agreed concession), again all normalized relative to the pre-existing tariff.

As a comparison of the first three (Sales) columns of the second and third rows across Tables A2 and A3 reveals, for newcomers (Table A2 – acceding countries) there is substantial deepening of own-tariff offers within a product-negotiating partner pair between the initially offered tariff cut and the final agreed tariff cut, while for existing GATT members (Table A3 – non-acceding countries) there is essentially no movement. A similar conclusion emerges from a comparison of the fifth and sixth rows across Tables A2 and A3: for newcomers, there is substantial deepening of their product level own-tariff offers between the earliest offer they made on that product (to any bargaining partner) and the last offer they made on that product (to any bargaining partner) prior to the round's conclusion, while for existing GATT members there is no such movement. For each of the three columns, the behavior of the newcomers along this dimension as displayed in Table A3 is statistically different from that of the existing GATT members as displayed in Table A2 at any standard level of significance. Finally, the movements in bargaining partner tariffs between the second and third rows of the last three (Purchases) columns are broadly similar across Tables A2 and A3 and relatively small, as expected given the similar sets of partners with which acceding countries and existing GATT members negotiated and the importance of existing GATT members in those sets. From the perspective of Stylized Fact 2(i), it therefore appears that newcomers to GATT behaved in a more traditionally strategic manner at Torquay than did those countries with more negotiating experience in the GATT bargaining forum.

The evidence regarding Stylized Fact 1 paints a similar picture. As an example, consider Figure A2, which like Figure 2 for the US, displays an overview of the timing and actions – request (R), modification of request (RM), offer (O), modification of offer (OM), withdrawal of offer (OW), agreement (A) and modification of agreement (AM) – for each of the 24 bilateral negotiations involving Germany at Torquay. The relative frequency of RMs that occur after

Os in the timeline of Germany's bilaterals in Figure A2 as compared to the timeline of the US bilaterals in Figure 2 illustrates the point: once the initial proposals were on the table, newcomers such as Germany appear to have been more open than existing GATT members to respond to imbalances in the outstanding offers by adjusting their requests rather than their offers. Taken as a group, newcomers at Torquay were almost twice as likely as existing GATT members (32% versus 18%) to make counter-proposals by modifying the tariff-cut requests they were asking of their bargaining partners rather than modifying their own-tariff-cut offers.

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WTO Appellate Body (2004), *United States-Anti-Dumping Act of 1916—Recourse to arbitration by the United States under 22.6 of the DSU*. WT/DS136/ARB, 24 February

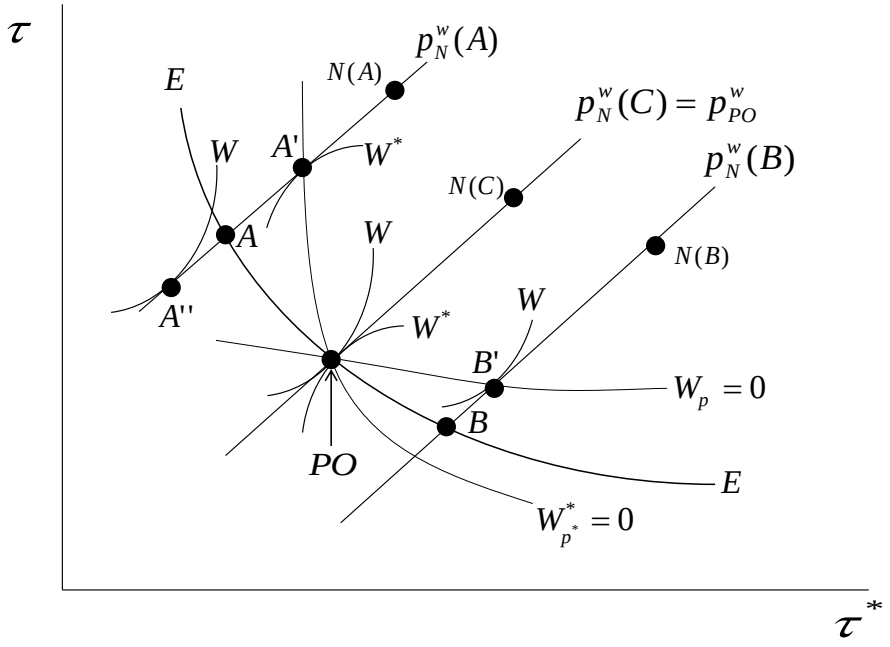


Figure A1: Reciprocity and Politically Optimal Reaction Curves

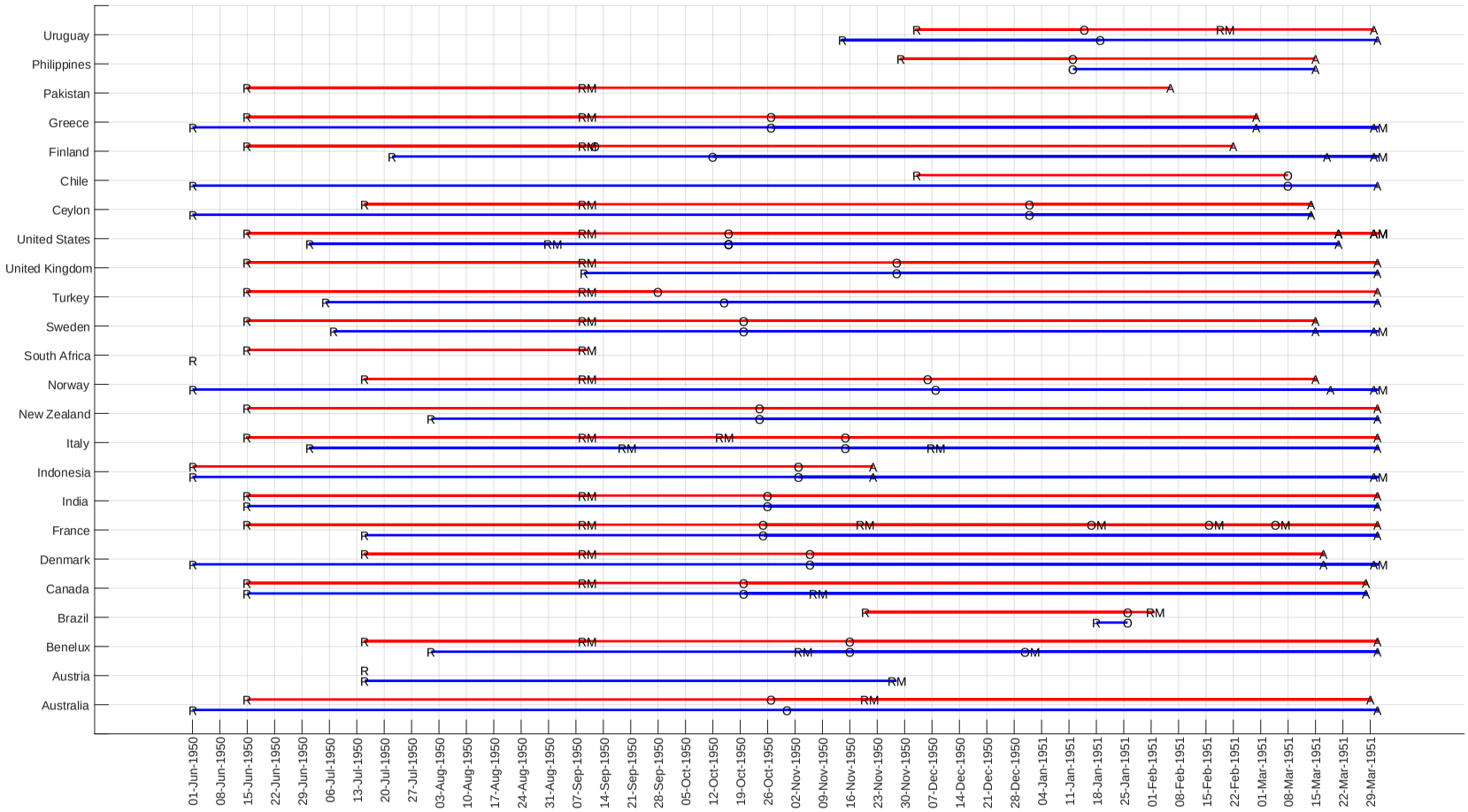


Figure A2: Timing of Actions in Germany Torquay Bilaterals. Notes: Time is on the horizontal axis. For each German negotiating partner listed on the vertical axis, the bottom (blue) line displays the actions relating to the German tariff while the top (red) line displays the actions relating to the foreign negotiating partner's tariff. R indicates request. O indicates offer. A indicates agreement. M indicates modification. W indicates withdrawal

Country	Existing Preference Margin		Proposed Preference Margin		Preference Margin Change	
	Ad Valorem	Specific	Ad Valorem	Specific	Ad Valorem	Specific
UNITED KINGDOM	1.091	0.009	1.077	0.007	-0.012	-0.002
AUSTRALIA	1.200	27.078	1.180	26.670	-0.017	-0.409
NEW ZEALAND	1.188	1.000	1.172	0.000	-0.013	-1.000

Table A1: Changes in tariff preference margins at Torquay. Each row corresponds to a Commonwealth country who, in its bilateral tariff bargains at Torquay, offered MFN tariff cuts on HS6 products for which it granted preferential tariff access to its Commonwealth partners. See text for definition of preference margins; ad valorem entries are 1 plus the preference margin, ad valorem preference margin change is the ratio of proposed over existing minus 1.

		Sales			Purchases		
		Ad Val	Specific	All	Ad Val	Specific	All
		Country-Specific					
Initial request over existing tariff	Mean	0.471	0.611	0.544	0.571	0.617	0.585
	SD	0.294	0.327	0.319	0.223	0.290	0.246
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	4306	4696	9002	6366	2756	9122
Initial offer over existing tariff	Mean	0.827	0.870	0.855	0.829	0.840	0.833
	SD	0.229	0.203	0.213	0.179	0.225	0.197
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	1798	3445	5243	3607	2014	5621
Final agreed concession over existing tariff	Mean	0.725	0.846	0.819	0.807	0.849	0.820
	SD	0.179	0.241	0.234	0.183	0.232	0.201
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	668	2271	2939	2887	1324	4211
		Cross-Country					
Initial request over existing tariff	Mean	0.476	0.625	0.559			
	SD	0.301	0.332	0.327			
	Min	0	0	0			
	Max	1	1	1			
	N	2904	3703	6607			
Initial offer over existing tariff	Mean	0.836	0.876	0.862			
	SD	0.233	0.199	0.212			
	Min	0	0	0			
	Max	1	1	1			
	N	1491	2807	4298			
Final offer over existing tariff	Mean	0.791	0.844	0.829			
	SD	0.239	0.237	0.239			
	Min	0	0	0			
	Max	1	1	1			
	N	1034	2568	3602			

Table A2: Initial requests, initial offers and final offers and concessions over existing tariffs for all acceding countries in the Torquay Round. "Sales" refer to requests of and offers on own tariffs. "Purchases" refer to requests of and offers on the tariffs of the bargaining partner. Country-Specific numbers refer to a given Seller-Purchaser-HS6, and describe the evolution of tariff concessions from initial requests to finalized agreed concession. Some goods appear in both the ad valorem and specific columns. Cross-Country numbers refer to a given Seller-HS6, and describe the evolution of tariff concessions from initial requests to the last offer made.

		Sales			Purchases		
		Ad Val	Specific	All	Ad Val	Specific	All
		Country-Specific					
Initial request over existing tariff	Mean	0.543	0.577	0.554	0.512	0.582	0.539
	SD	0.235	0.306	0.260	0.257	0.321	0.286
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	17681	7971	25652	15621	9911	25532
Initial offer over existing tariff	Mean	0.804	0.817	0.808	0.796	0.845	0.817
	SD	0.195	0.233	0.208	0.213	0.218	0.216
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	8387	3577	11964	6578	5008	11586
Final agreed concession over existing tariff	Mean	0.797	0.827	0.806	0.773	0.831	0.802
	SD	0.200	0.235	0.212	0.211	0.240	0.228
	Min	0	0	0	0	0	0
	Max	1	1	1	1	1	1
	N	5603	2394	7997	3384	3341	6725
		Cross-Country					
Initial request over existing tariff	Mean	0.543	0.576	0.554			
	SD	0.237	0.308	0.264			
	Min	0	0	0			
	Max	1	1	1			
	N	14139	7172	21311			
Initial offer over existing tariff	Mean	0.810	0.825	0.815			
	SD	0.197	0.233	0.209			
	Min	0	0	0			
	Max	1	1	1			
	N	6845	3226	10071			
Final offer over existing tariff	Mean	0.801	0.816	0.806			
	SD	0.202	0.241	0.216			
	Min	0	0	0			
	Max	1	1	1			
	N	6813	3217	10030			

Table A3: Initial requests, initial offers and final offers and concessions over existing tariffs for all non-acceding countries (existing GATT members) in the Torquay Round. "Sales" refer to requests of and offers on own tariffs. "Purchases" refer to requests of and offers on the tariffs of the bargaining partner. Country-Specific numbers refer to a given Seller-Purchaser-HS6, and describe the evolution of tariff concessions from initial requests to finalized agreed concession. Some goods appear in both the ad valorem and specific columns. Cross-Country numbers refer to a given Seller-HS6, and describe the evolution of tariff concessions from initial requests to the last offer made.

	mean		median		min		max		standard deviation				
	pre(%)	post(%)	pre(%)	post(%)	pre(%)	post(%)	pre(%)	post(%)	pre(%)	post(%)	bound(%)	A/R(%)	A/O(%)
Australia	39.88	26.71	42.5	27.5	12.5	0	70.01	45	15.01	15.73	31.37	13.43	44.62
Austria	10	10	10	10	10	10	10	10			100	43.22	66.28
Benelux	13.53	12.09	15	10	0	0	30	25	7.72	7.26	74.05	22.34	28.03
Brazil												3.08	4.04
Canada	26.23	18.48	25	20	5	0	926.11	30	49.55	6.08	17.61	41.62	76.39
Ceylon	15	15	15	15	15	15	15	15	0	0	100	9.87	81.40
Chile												0.54	10
Czechoslovakia											47.76	40.74	28.36
Denmark	15.52	13.33	15	15	5	0	35	25	9.70	9.31	66.67	24.41	55
Dominican Republic	24.52	20.24	25	20	15	15	45	35	9.86	6.61	33.33	29.94	59.05
Finland	125.87	19.87	150	20	8	8	150	35	47.76	5.30	13.33	21.51	45.68
France	23.79	16.67	24	17.58	0	0	80	55	7.78	8.18	10.49	43.62	64.48
Germany	19.96	15.46	20	17.5	0	0	37.5	31.33	8.82	7.69	31.96	35.01	58.74
Greece	50.50	38.38	40	40	10	10	87.5	60	30.72	21.92	30.77	31.22	71.94
India	19.53	13.90	20	12	10	10	30	30	9.65	5.71	53.49	4.95	60.38
Indonesia	10.32	10.17	9	9	9	9	18	18	2.49	2.28	96.61	18.48	71.76
Italy	30.84	22.61	31.67	24	0	0	75	45	10.46	7.13	8.93	37.36	56.15
New Zealand	27.19	23.54	20	20	20	15	45	35	9.94	7.78	45.83	8.42	68.12
Norway	20.45	17.37	20	15	10	10	30	30	5.06	5.68	34.52	30.39	48.10
Pakistan	34.34	27.55	30	25	18.75	10	75	50	14.43	8.94	5	2.68	
Peru	24.65	19.92	18.33	12.50	10.50	10.50	200	200	36.61	37.52	20	59.66	84.94
Philippines	31.50	19.05	25	15	10	7	62.5	40	16.68	8.16	5.83	46.76	60.50
South Africa	9.87	6.33	6.50	3	3	3	20	20	6.24	6.06	26.67	6.06	21.21
South Korea	36.85	24.81	25	20	10	0	100	80	26.53	23.39	25.93	78.41	95.12
Southern Rhodesia	19.70	10.45	25	10	10	5	26.67	20	7.59	5.68	36.36	6	96
Sweden	14.81	13.24	15	10	10	10	30	25	5.45	4.27	72.13	34.31	53.90
Turkey	11.25	11.25	10	10	10	10	15	15	2.50	2.50	100	44.61	53.81
United Kingdom	28.01	18.68	20	20	0	0	885	33.33	72.01	7.27	37.93	11.24	17.96
United States	30.03	17.24	25	13.75	0	0	2500	55	90.08	9.73	5.43	37.44	71.19
Uruguay	74.25	58.21	78	52	31.50	21.20	105.75	105.75	16.64	24.82	45.83	5.19	50

Table A4: Summary Statistics about Bargaining Activity.

Notes: This table presents summary statistics about bargaining activity and tariffs by country for the Torquay Round. The first 10 columns present summary statistics on tariffs (in ad valorem terms) before and after the Torquay round negotiation, conditional on a product being part of the final set of tariff reductions for that country; "bound" is the percentage of agreed tariffs that represent bindings at the existing applied tariff level; A/R is the percentage of products for which the country received a request to lower its tariffs and actually lowered (or bound) the tariffs in the final agreement; A/O is the percentage of products for which the country replied with an offer and actually lowered (or bound) the tariffs in the final agreement. The following countries are omitted from the table since no agreements are made: Cuba, Guatamala, Haiti, Liberia, Nicaragua and Syria-Lebanon. Blank cells indicate that quantitative data about those tariffs was missing for all relevant observations.

Online Data Appendix for "Multilateral Trade Bargaining: A First Look at the GATT Bargaining Records"

Kyle Bagwell Robert W. Staiger Ali Yurukoglu

July 2020

1. Data Appendix

In this appendix, we detail the steps we have taken to process the Torquay bargaining records into a format for analysis. The most challenging step in this process was creating a concordance of product descriptions from the Torquay records to the HS6 1988 product codes. Below we define the data elements that we extracted from the bargaining records, and then we discuss the concordance process which we applied to the bargaining records. Finally, we illustrate how the GATT bargaining records make it possible to recover the complete history of offers and counteroffers in the Torquay Round.

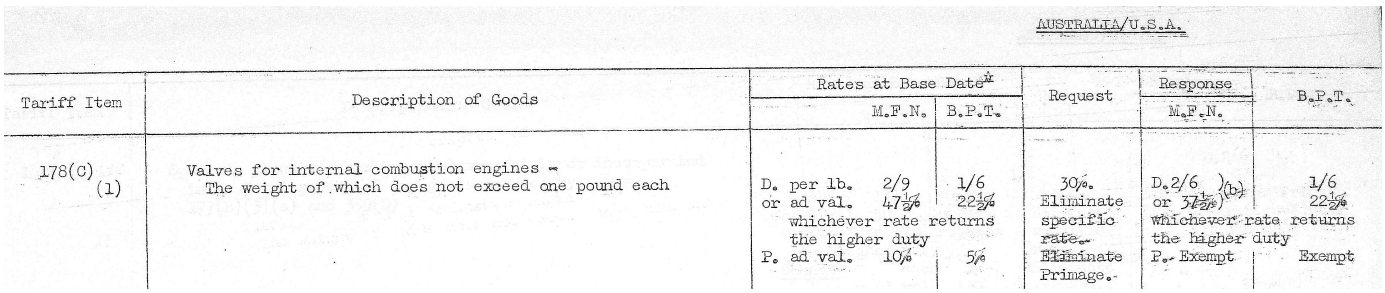
1.1. Bargaining Records

The first major task in assembling the dataset was to transfer the information from the scanned bargaining records posted on the WTO web site to a workable spreadsheet. We accomplished this in two steps. In a first step we hired transcribers to enter into Excel exactly what appeared on the original scans. Then in a second step, we transferred the raw Excel data into a bargaining record template that we created as a way to standardize the structure of the data for each of the bilateral negotiations.

We used the following set of variables as the template for how each bargaining record was input into the complete spreadsheet. The list below gives the field title (in bold), an example entry (in italics), and a more detailed description of the meaning of the field. The example reproduced below as Figure 1.1 is taken from the negotiations between Australia and the United States.

1. **Bargaining Partners**: *United States and Australia.* Countries engaging in a given bilateral bargain.

2. **Proposal Date**: *10/25/1950.* Date on which the document was submitted.



AUSTRALIA/U.S.A.

Tariff Item	Description of Goods	Rates at Base Date* M.F.N.	Rates at Base Date* B.P.T.	Request	Response M.F.N.	Response B.P.T.
178(C) (1)	Valves for internal combustion engines - The weight of which does not exceed one pound each	D. per lb. 2/9 or ad val. 47½% whichever rate returns the higher duty P. ad val. 10%	1/6 22½% 5%	30%. Eliminate specific rate. Eliminate Primage.	D. 2/6 or 37½% (b) whichever rate returns the higher duty P. Exempt	1/6 22½% Exempt

Figure 1.1: *An example item from the US-Australia bargaining records.*

3. **Proposer Country**: *Australia.* Country submitting the document.

4. **Proposal Type (Request, Offer, Modification of Request, Modification of Offer, Final Offer)**: *Offer.* Nature of the content of the document; in the example, Australia is making an offer to the US.

5. **Target Country**: *United States.* Country to whom the document is being submitted for review/approval.

6. **Currency**: *Australian Pound ("s.d").* Currency used in the document.

7. **Tariff Item No.**: *178(C)(1).* If available, item number in the tariff schedule of the tariff-cutting country.

8. **Statistical Class Number**: *(blank).* If available, the item number for the good of which the concession is requested/offered, taken from the tariff-cutting country's trade data (key in determining negotiating rights through principal supplier).

9. **Description of Products**: *Valves for internal combustion engines - The weight of which does not exceed one pound each.* Description of the product in the bargaining record.

10. **Duty Unit (Specific Only)**: *per lb.* Units used for a specific tariff.

11. **History of Tariffs: Act of 1930**: *(blank).* Tariff resulting from the Smoot-Hawley Tariff Act in 1930 (US only).

12. **History of Tariffs: January 1, 1945**: *(blank).* Tariff in effect as of the commencement of GATT (in the current dataset, only reported by the US on concession offers made).

13. **Present Duty Rate: MFN Tariff**: MFN tariff rate in effect at the beginning of the round of negotiations. Base date is November 15, 1949 for the Torquay round (GATT/CP/43, page 5).

    (i) **Specific**: *2/9*

    (ii) **Ad Valorem**: *0.4750*

(iii) **Both (IF BOTH: Maximum/Minimum/Combination)**: *Maximum.*

14. **Present Duty Rate: Additional Surtax**: *(blank).*

15. **Present Duty Rate: MFN Primage**: *0.1000.* Additional ad valorem import duty levied by customs (used exclusively by Australia in current dataset).

16. **Present Duty Rate: Preferential Tariff**: MFN tariff rate in effect at the beginning of the round of negotiations.

    (i) **Specific**: *1/6*

    (ii) **Ad Valorem**: *0.2250*

    (iii) **Both (IF BOTH: Maximum/Minimum/Combination)**: *Maximum.*

17. **Present Duty Rate: Preferential Primage**: *0.0500.* Additional ad valorem import duty levied by customs (used exclusively by Australia in current dataset).

18. **Requested or Offered Duty Rate: MFN Tariff**: The requested or offered modified MFN tariff rate. Because the example is of Australia's offer, the remaining parts of this specific record item are all offers (the US request of "*30%. Eliminate specific rate. Eliminate Primage.*" would be listed in the corresponding earlier bargaining record item).

    (i) **Specific**: *2/6*

    (ii) **Ad Valorem**: *0.3750*

    (iii) **Both (IF BOTH: Maximum/Minimum/Combination)**: *Maximum.*

19. **Requested or Offered Tariff Binding (Denoted by 'b')**: *(blank).* Binary variable indicating if the country specifically requested that the tariff be bound against future increases. In this case, the US did not specifically request that Australia bind the tariff against future increase.

20. **Requested or Offered Duty Rate: Additional Surtax**: *(blank).*

21. **Requested or Offered Duty Rate: MFN Primage**: *Exempt.*

22. **Requested or Offered Duty Rate: Preferential Tariff**: Requested adjustments to any preferential tariff rates.

    (i) **Specific**: *1/6*

    (ii) **Ad Valorem**: *0.2250*

    (iii) **Both (IF BOTH: Maximum/Minimum/Combination)**: *Maximum.*

23. **Requested or Offered Duty Rate: Preferential Primage**: *Exempt.*

24. **Remarks**: *BPT*. Any additional information included that is beyond the scope of the other entries. The note here is specifying that the above preferential rates are the British Preferential Tariff rates.

25. **Negotiation Status (Continuing/Terminated/Successfully completed)**: *Continuing*. An indication of the stage of the bilateral negotiation.

1.2. Concording Bargaining Data to the Harmonized System

We used a multistage process to assign the relevant 1988 HS6 codes to each of the items in the Torquay bargaining records. The first stage consisted of applying existing concordances to the bargaining records. In the second stage, products that were not successfully matched in stage one were matched using an automated string-matching score-function approach. This approach assigned candidate concordances to a bargaining record product description based on the similarity of the description to the HS6 product descriptions. For products still unsuccessfully matched after the first two stages, the final stage was the manual assignment of HS6 codes based on human judgment and research.

First stage. Instead of trying to match across the 40-year gap between the Torquay round descriptions and the HS 1988 product descriptions, whenever possible we matched across smaller time gaps using product classifications from four points in time. This strategy enabled us to more accurately match products and it allowed us to use existing concordances to cover part of the time gap. We began by assigning Schedule A 1948 product codes (taken from "Schedule A: Statistical Classification of Imports into the United States") to the bargaining records.[1] Next, we matched Schedule A 1948 product descriptions to a later version of Schedule A (published in 1963). Matching to different versions of the same classification system was relatively straightforward even with the 15 year time gap. We then matched the 1963 Schedule A codes to the TSUSA product codes from 1972. Once we had concorded to the 1972 TSUSA codes, we used the concordance from TSUSA 1972 to HS6 1988 created by Robert Feenstra and his colleagues at the Center for International Data as a part of their work creating the world trade database.

The US included its Schedule A 1948 product codes on the vast majority of its offers at Torquay. This allowed us to directly match almost all US offers to the Schedule A 1948 code. Completion of the remaining concordances (Schedule A 1948 to 1963, Schedule A 1963 to TSUSA 1972) for the products with Schedule A 1948 codes was done by using the matching algorithm described below.

Second stage. For product descriptions without existing concordances, we created a score variable for each product-HS6 code combination. This score is a function of the text of the product description and the text of the HS6 code. A higher score indicates that the text in these two fields is more similar on relevant dimensions. To calculate the score between product descriptions and HS6 codes, we took the following steps:[2]

[1] For simplicity, we refer to the combination of Schedule A 1946 classifications and 1948 updates as "Schedule A 1948."

[2] Ultimately, we also used the 4-digit level scores. We then found the total score by taking the simple average of the score from the 6-digit HS descriptions and the 4-digit ones.

1. Translate any non-English descriptions to English using Google Translate and run spell check on all words in the bargaining records.

2. Stem all words using the Snowball stemming method.[3]

3. For each word in both the bargaining records and the HS6 product classifications, compute the IDF (inverse document frequency) score as the inverse of the number of uses of that word in the bargaining records.

4. Compute the score for a given HS6 product description as a function of the number of matching words and two word phrases between the HS6 code description and the bargaining record description, with a bonus being added to the score for matching either of the first two words in either description. A more detailed discussion of the score function is given below.

5. Next, given a threshold score (chosen based on manual inspection), any score above the threshold is a "candidate match." All descriptions whose maximum score is below the threshold are sent back into the unmatched pool of product descriptions.

6. Manually scan the candidate matches for errors, then return any with errors to the unmatched pool.

To further elaborate on the score function discussed in part 4 of the above process, denote the collection of Torquay bargaining record descriptions as $T = \left\{T^1, T^2, \ldots, T^n\right\}$ with T^i being the i^th description/sentence. Denote the $T^i = \left\{T^i_1, T^i_2, \ldots, T^i_{n_i}\right\}$ with T^i_j being the j^th word in sentence T^i. Thus, we say T is a collection of sentences, each sentence T^i is a collection of words. Similarly, denote the collection of HS6 (1988) product descriptions as $H = \left\{H^1, H^2, \ldots, H^m\right\}$ with H^i being the i^th description/sentence. Denote the $H^i = \left\{H^i_1, H^i_2, \ldots, H^i_{m_i}\right\}$ with H^i_j being the j^th word in sentence H^i. Thus, we say H is a collection of sentences, each sentence T^i is a collection of words.

We use the following two definitions of the IDF for the score function. First, define the IDF of word x, $IDF(x)$, as the inverse frequency of word x in the universe of words from T and H. Next, define the IDF of words x_1 and x_2 as $idf(x_1, x_2) \equiv \dfrac{IDF(x_1) + IDF(x_2)}{2}$.

To complete the definitions for the score function, we use three additional variables. Define for word x and description Y, $D(x, Y) \equiv 1$ if $x \in Y$, $D(x, Y) \equiv 0$ otherwise. Also, for words x_1 and x_2, define $d(x_1, x_2, Y) = D(x_1, Y) \cdot D(x_2, Y)$. Finally, define the score function's bonus weight $B_k \equiv 3$ if $k \leq 2$, $B_k \equiv 1$ otherwise.

The score function for the match between description T^i and description H^j is

$$S\left(T^i, H^j\right) \triangleq \sum_{k=1}^{n_i} B_k \cdot s\left(T^i_k, H^j\right) + \sum_{k=1}^{2} B_k \cdot s\left(H^j_k, T^i\right),$$

[3]Created by Martin Porter in his paper,"An algorithm for suffix stripping" (1980). Download of code available at http://snowball.tartarus.org/.

where $s\left(X_k^i, Y^j\right) \equiv IDF\left(X_k^i\right) \cdot D\left(X_k^i, Y^j\right) + idf\left(X_k^i, X_{k+1}^i, Y^j\right) \cdot d\left(X_k^i, X_{k+1}^i, Y^j\right)$, given word $X_k^i \in X^i \in X$ and $Y^j \in Y$.[4]

There were some commonalities in the products sent back to the unmatched pool during this process. For example, product descriptions hinging on the words "not," "other," or another similar term. An example of this is the following product in the US-Benelux negotiations: *Ammonium compounds, n.e.s.: Other than ammonium chrome alum.* In this case, the matching algorithm generated the exact same set of HS6 code matches as the matches generated for *Ammonium compounds, n.e.s.: Ammonium chrome alum.*

Third Stage. For all remaining unmatched product descriptions, we manually went through each individual product description and assigned HS6 codes. Manual matching relied greatly on the use of online HS Code search engines and various other websites, as many terms used to describe products in the 1948 data are archaic.[5]

We performed this three-step process on the bargaining records. In the end, we were able to match 97% of the product entries in the bargaining records to a 1988 HS6 code.

1.3. Aggregation of Bargaining Records

We aggregate the Torquay bargaining data (originally at eight- to ten-digit level with various country codes) up to the HS6 level. Hence, for any HS6 code, we are typically aggregating multiple records from the more disaggregated product data.

To aggregate the bargaining data, we do the following: (a) unless otherwise indicated, for variables referring to ad valorem or specific tariff levels (initial, offered, requested), we aggregate the tariff level for HS6 product i as an unweighted average of the tariff levels for the disaggregated products that have been allocated to HS6 product i (and omit from the average any missing disaggregated-product tariff levels); and (b) unless otherwise indicated, for dummy/indicator variables referring to whether an action (e.g., a request from country j on HS6 product i, or a US agreement on HS6 product i) has or has not occurred, we define the action as occurring for HS6 product i if and only if it occurs for at least one disaggregated product that has been allocated to HS6 product i.

1.4. Recovering the History of Offers and Counteroffers

The GATT bargaining records make it possible to recover the complete history of offers and counteroffers in the Torquay Round. To illustrate, we highlight in Figure 1.2 below the bargaining behavior of the US with regard to one particular 6-digit product, HS 843319 (Mowers for lawns, other than powered and with a horizontal rotating cutter). Specifically, this figure depicts the complete request-offer sequence involving the tariffs on such lawn mowers between the US and each of the five countries whose bilateral bargains with the US involved a request and/or offer on this product. We denote by the symbol R a request, by O an offer, by OW a withdrawn offer and by A an agreement. These symbols are positioned at the height of the tariff request or offer, so that a horizontal line between any two symbols indicates that the

[4]For the last word in X, ignore the second term.

[5]One of the most useful search engines, the Schedule B Search Engine (created by 3CE Technologies) is available at https://uscensus.prod.3ceonline.com.

tariff level across those two actions is the same, while an upward sloping (downward sloping) line between any two symbols indicates that the tariff level across those two actions increased (decreased).

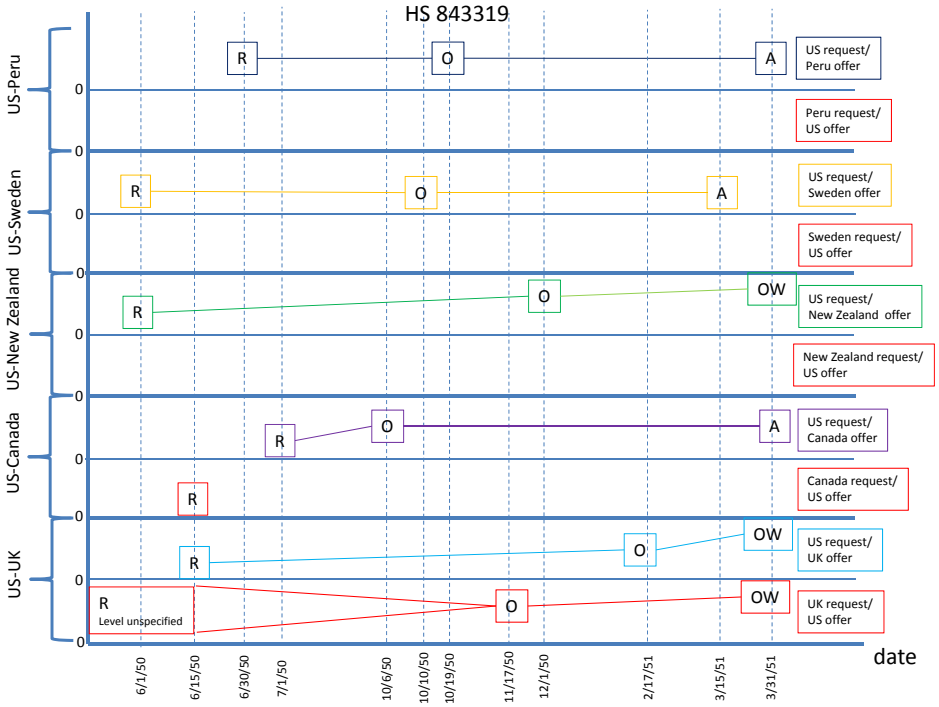


Figure 1.2: Requests and Offers on Lawn Mowers in US Torquay Bilaterals.

Notes: This Figure depicts the complete request-offer sequence between the US and each of the five countries whose bilateral bargains with the US involved a request and/or offer on lawn mowers (HS 843319). The symbol R denotes a request, O an offer, OW a withdrawn offer and A an agreement. These symbols are positioned at the height of the tariff request or offer, so that a horizontal (upward/downward sloping) line between any two symbols indicates that the tariff level across those two actions is the same (increased/decreased).

As reflected in the figure, between June 1 and July 1, 1950, the US made requests of all five of these countries (Canada, New Zealand, Peru, Sweden and the UK) to reduce their import tariffs on such lawn mowers, and the US received requests to reduce its own tariff on these lawn mowers from two of the countries (Canada and the UK). In the months that followed, Peru and Sweden each made offers to the US at a level which met the US request, while New Zealand, Canada and the UK each made offers to the US at a level which did not go all the way to meet the US request and New Zealand and the UK subsequently withdrew their offers; and for its part, the US did not respond to the Canadian request but did make an offer to the UK to cut its tariff on this product, an offer that the US subsequently withdrew. The final commitments on HS 843319 tariffs emerging from these five bilaterals were three: a commitment by Canada negotiated with the US to reduce the Canadian tariff on lawn mowers; a commitment by Peru

negotiated with the US to reduce the Peruvian tariff on lawn mowers; and a commitment by Sweden negotiated with the US to reduce the Swedish tariff on lawn mowers.