

Institutions and Outcomes: The GATT/WTO and Postwar Trade

The abundant literature about institutions regards the postwar trade regime as its “beau ideal” (Goldstein, Rivers, and Tomz 2007a, 38). Yet, it was only five years ago that Andrew Rose published the first systematic empirical analysis of its effects. Contravening conventional wisdom, he found that the General Agreement on Tariffs and Trade and its successor, the World Trade Organization, did not exert any significant impact on trade (Rose 2004). In a paper published in *IO* in 2007, Judith Goldstein, Douglas Rivers, and Michael Tomz (hereafter GRT) argue that Rose incorrectly assigned to the base group many states that had standing in the GATT. Expanding its membership roster accordingly, they find that the regime had a large, positive, and significant impact on its members’ trade regardless of their level of development (2007b, 57).

In this research note, I argue that testing the empirical implications of existing theories can yield considerably more insight into the effects of the postwar regime. While the GRT paper examines carefully whether trade expansion varies as a function of the ways states joined the GATT/WTO, it does not test the predictions that existing theories make about the processes that governed postwar tariff bargaining under its auspices. This is so despite the fact that these predictions associate variations in process with variations in outcomes among different subsets of member states.

More specifically, market-failure theory implies that a regime will exert its strongest impact on a small set of very large states, because it enables them to realize a Pareto-improving equilibrium outcome of a Prisoners’ Dilemma (PD) game. As the regime required most-favored nation (MFN) treatment, a natural extension of this prediction is that smaller countries with relative factor endowments similar to those of the largest states will also realize a sizeable expansion of their trade. Finally, the theory implies that other countries

with different endowments—i.e., less-developed countries (LDCs)--will play a distinctly marginal role.

A different prediction about LDCs emerges from a theory that links trade to the politics of life in an anarchic system. According to it, allies will trade more freely with each other than will other states, because the increase in real income that accrues to states engaged in trade also increases their potential military power (Gowa and Mansfield 1993; Gowa 1994). Although the original argument does not accord a role to either small states or institutions, I argue here that a trade regime can insure its smaller members against the renegeing that waning political ties can prompt. This implies that regime membership will be particularly beneficial to LDCs when alliances bind them to other states.

In this paper, I test these predictions against the data. In accord with market-failure theory, the results show that the regime exerts its strongest impact on trade between its largest member states. Trade also expands markedly between smaller regime members with relative factor endowments similar to those of the largest states. The results also show that alliances strongly influence the regime's impact on its LDC members: their trade is much higher when they are bound by both alliances and regime membership than when they are linked by either one alone. Thus, taking the politics of cooperation and conflict into account helps to produce a richer picture of the operation of the postwar trade regime.

I begin by describing briefly the Rose and GRT findings. Then, I explain the theories that generate testable implications about regime membership. Finally, I test these predictions against the data.

Recent Literature

Although no theory predicts that the GATT/WTO will exert a uniform effect on its member states, the benchmark analysis in Rose (2004) includes all of them in the same "treatment" group. He codes states as GATT/WTO members if they either joined the

organization at its inception or did so thereafter in accord with the accession protocol in effect when they joined.¹ Using a gravity model, the industry standard, he estimates the determinants of bilateral trade flows between 1950 and 1999. Controlling for membership in preferential trade agreements (PTAs), distance, and gross domestic product per capita, *inter alia*, he finds that GATT/WTO membership “is *not* associated with enhanced trade” (2004, 98, *emphasis original*).²

The GRT data include many more PTAs; variables that indicate whether states are members of unilateral PTAs or of colonial empires; and information about the years between 1946 and 2004.³⁴ Most importantly, GRT expand the GATT/WTO membership roster. Based on archival research, they conclude that Rose assigns to the base group many states that had standing in the organization. These “nonmember participants” (NMPs) joined the GATT in one of three ways: 1) their imperial powers signed them on; 2) they remained in the GATT as “*de facto*” members after independence; or 3) they acquired “provisional” member status once they began but before they completed the accession process (2007b, 40-43).⁵

Using the expanded membership roster, GRT add to the baseline Rose specification year and dyadic fixed effects. They find that member nations as a whole trade about 43 percent more with each other than base-group states (2007b, 55). They also show that the

¹Early on, both acceding and member states made tariff concessions; after the Tokyo Round, only the acceding state did so (Hoda 2001, 73).

²In his robustness tests, he disaggregates members in several ways, including, for example, industrial-country status. None of the tests leads him to change his conclusion.

³Their data (GRT_IO_2007.zip) are at www.stanford.edu/~tomz.

⁴An example of a unilateral or nonreciprocal agreement is the Lome Convention, in which EC members gave preferences to imports from their former colonies without asking for reciprocity.

⁵NMPs disappear with the GATT, as the WTO required states to accede formally. Except for Tunisia (a provisional member for 30 years), the 10 states in this third category shifted relatively quickly to formal membership status. On average, they completed the requisite negotiations within five years. They enjoyed the same rights as other members as long as the latter had acceded to the declaration on provisional accession (GRT 2007a, 2008).

GATT/WTO effect varies across three types of country pairs: 1) formal member dyads--i.e., country pairs composed of states that signed the 1948 Havana Charter or later completed a standard accession protocol; 2) NMP dyads; and 3) “mixed” dyads—that is, those that include one formal member and one NMP. The distribution of GATT/WTO member dyads among these groups is highly skewed: formal-member country pairs account for 84 percent of them; NMPs for about one percent; and mixed dyads for about 15 percent.

GRT report that NMP trade is about 56 percent higher than is that of base-group members. The corresponding statistics for formal and mixed dyads are 41 and 46 percent, respectively (2007b, 55).⁶ The authors themselves find these results puzzling, noting that all groups “had essentially the same rights and obligations” (2007a, 2011). Rose is puzzled too: he finds it “implausible” that the regime’s relevance “can be rescued through reclassifying many developing countries that are spiritually but not technically GATT members” (2007, 2020).

Yet, GRT emphasize that “participation appears to benefit all countries no matter their level of development (2007b, 57). They find that trade expanded “by more than 70 percent when both trading partners were industrial nations, by about 45 percent when trade was between an industrial and a developing economy, and by approximately 33 percent between developing countries” (2007b, 56). As the authors point out, these results “contradict the conventional wisdom that the GATT/WTO did little to spur the trade of developing countries” (2007b, 57). They attribute this to the market access that the MFN clause gave them and to the tariff cuts and bindings they implemented at the urging of the regime.

While GRT have done much to advance the analysis of the postwar regime, they have not brought to bear on the data the insights of the theoretical literature about institutions.

⁶In their IO article, GRT report that the difference between formal and NMP members is not significant (2007b, 54, n39). The difference between formal and mixed dyads is, however, significant (p-value = 0.05). All pair wise differences are significant in their AER paper (2007a, 2013).

This is so despite the fact that one of its major insights is that different processes govern trade expansion among different subsets of regime members. I turn to the theories now.

Theory

The canonical representation of the free-trade problem in the existing literature is based on the Prisoner's Dilemma (PD) game. As is well known, states engaged in a PD game are better off if they cooperate with each other than if they all defect. However, a state is even better off if alone defects. In the absence of a central government, indefinitely repeated interactions allow states to realize a Pareto-improving equilibrium outcome if each can monitor the behavior of others.

According to market-failure theory, it is precisely this logic that explains the origins of the GATT/WTO (e.g., Bagwell and Staiger 2002). In standard trade theory, tariff bargaining conforms to a PD game when states are "large"—that is, when a state has sufficient market power to influence its terms of trade. The dominant strategy of a large state is to impose an "optimal" tariff, an import tax that maximizes the gain that accrues to it as a result of the improved terms of trade it induces net of the costs it inflicts due to its adverse effect on trade volume.

When more than one country acts on this logic, however, prices do not change but trade drops, making each nation worse off than it would have been had free trade prevailed. Thus, large countries will be better off if none impose trade barriers. This is so whether they tax imports to improve the relative price of their exports or to protect domestic industries. In both cases, it is "their ability to shift the costs of protection onto one another through terms-of-trade movements" that matters (Bagwell and Staiger 2002, 3).

Because states face a temptation to defect even if they agree to adhere to a strategy profile that produces a Pareto-improving equilibrium outcome, however, they will agree to lower their trade barriers only if they believe that their interactions will continue indefinitely

and if they can detect cheating. Market-failure theory suggests that institutions can facilitate trade in this situation if they can reduce the marginal cost of negotiating additional tariff cuts, encouraging indefinite repetitions of the stage game, and/or if they can supply information to states about compliance.

The theory assigns little importance to small states. By definition, a small state cannot affect its terms of trade: the effects of any tariff it imposes “move through the local prices within the country and thus reside entirely within national boundaries” (Bagwell 2007, 4). Thus, a small country’s tariff is welfare reducing on net: its consumers lose more than its producers and government gain, making free trade its dominant strategy. As such, a large country has no incentive to engage a small state in tariff bargaining. Small states also have no reason to bargain with each other, as their trade policies do not generate any negative externalities.

According to market-failure theory, then, a small group of very large member states will dominate the negotiations that occur under the auspices of a trade institution. The tariff cuts that these core states make will privilege each other’s products, as the only concessions that interest them are those that apply to the goods that they produce and exchange. Smaller countries with similar relative factor endowments, whether or not they are regime members, will be able to free ride on these tariff cuts to the extent that core states cannot make them excludable. In addition, smaller states will also be able to free ride on the retaliatory threats that large states wield by virtue of their market power.

In the case of the GATT/WTO, it is the industrial countries that are candidates for the role of both core countries and free riders. This is so because the contracting parties, at the initiative of the United States, essentially removed agricultural trade from the negotiating table. As such, the logic of market-failure theory assigns a distinctly marginal role to LDCs, relatively small countries with little market power and very different patterns of comparative

advantage. Figure 1 shows that market-failure theory seems to capture quite well postwar trends in trade between core states, between other industrial countries, and between nonindustrial member dyads (i.e., those that include at least one LDC).⁷

[Insert Figure 1 here]

Historical accounts of the postwar regime are also consistent with market-failure theory in several important ways. Both the principal-supplier rule and the practice of reciprocity, for example, privileged large-state members. The rule allowed only a nation that was the principal supplier of a product to the market of another country to ask the latter to cut its tariff on that product. This dictated an item-by-item approach to cutting tariffs that often required a long series of bilateral talks that began before and continued during official negotiating rounds. Thus, for example, U.S. and Japanese officials met at least 43 times in an effort to hammer out an accord between them that could be put into effect at the Kennedy Round.⁸

Item-by-item bilateral bargaining continued despite the fact that it was at that round that the contracting parties agreed to use a linear or formula approach to tariff cutting and that the European Economic Community (EEC) took over the roles that individual representatives of France and Germany had previously played. Historical accounts make clear that item-by-item bargaining remained a staple of postwar negotiations. Participants at the Kennedy round, for example,

quickly found that meaningful concessions usually could be given only between the principal supplier of industrial goods and the major importers. Multilateral negotiations were useful for exchanges of information and for general discussions of structural problems of trade and production in different industries, but they did not facilitate [the] specific discussions of reciprocity...that were a necessary part of the exchange of concessions. Consequently, what was a multilateral negotiation in

⁷I identify the members of each group below.

⁸ Memo from U.S. Mission, Geneva, to Department of State. Minutes of the Forty-Third Meeting between the U.S. and Japanese Kennedy Round Delegations. Declassified Documents 2008.

name became a large, complicated series of bilateral (or plurilateral) negotiations in fact (Winham 2001, 65).

The same was true of later tariff rounds. During the Tokyo Round, countries typically proposed tariff cuts “to the ‘principal supplier’ (the largest exporter) of a particular product. Conversely, in seeking concessions on their own exports, nations usually concentrated their efforts on the largest importer of their goods.” As a result, large states got “the most action,” as the “really” consequential tariff bargaining continued to occur bilaterally, especially between the “major players” (Windham 1997, 202). As such, adopting a linear approach did not eliminate bilateral negotiations but “only gave the participants an additional tool to employ” in their bargaining (Hoda 2001, 47).

A principal-supplier rule appeals to large states because it enables them to cut tariffs on each other’s products without technically violating Article I of the GATT/WTO charter. Article 1 dictates adherence to the most-favored nation (MFN) rule—that is, “any advantage, favor, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties.”⁹

A MFN clause is useful because it preempts the renegotiations that typically ensue when one or more of the parties to a trade agreement subsequently sign a tariff accord with a third party. It also opens the door to free riding, however, because it enables states to benefit from the tariff cuts others make without offering concessions of their own. The principal-supplier rule closes this loophole to the extent that it can restrict the benefits of tariff cuts to states that had “paid” for the concessions (Trebilcock and Howse 1999, 179). A 1946 UN press release made the link between the rule and the MFN clause explicit:

since the supreme role of the most-favored-nation treatment governs the relationship between the negotiating parties, it must be expected that importing country A will

⁹The charter text is at: wto.int/english/docs_e/legal_e/GATT/WTO47_01_e.htm.

be interested in granting to exporting country B concessions on products of which B is the main supplier, because...country A will [then] secure the highest concessions from B on other goods which A exports to country B (cited in Irwin et al. 2008, 116, n64).

Two other GATT/WTO practices also sought to restrict the free riding that the MFN clause permitted. One was tariff specialization—i.e., rewriting national tariff schedules to define very narrowly the product to which a particular tariff applied (Trebilcock and Howse 1999, 127). As this did not necessarily prevent all spillovers, “settling-up sessions” occurred before countries signed off on a negotiating round. In these talks, “previously negotiated” tariff cuts were “subject to threats of withdrawal or revision unless non-reciprocating countries [also] agreed to offer concessions” (Trebilcock and Howse 1999, 117). As agricultural products were largely immune from tariff cuts, it was the smaller industrial nations as a group that these talks would tend to target.

Because LDCs were rarely the “principal suppliers of anything,” they rarely left the bench (Wilkinson and Scott 2008, 486). Indeed, they sought primarily to exempt themselves from the obligations regime membership imposed, gaining “special and differential” treatment relatively early in the history of the GATT. From the perspective of market-failure theory, then, it is no surprise that LDCs typically held a comparative advantage in the production of goods excluded from the regime’s jurisdiction—e.g., textiles, clothing, and agriculture. Their lack of market power meant that their larger counterparts had little to lose when they imposed restrictions on their trade.¹⁰ Thus, as Under Secretary of State George Ball observed in 1962, the cotton-textile agreement was possible only because

the markets of the old industrialized countries of Europe and America were being disrupted by low-wage textile products from less-developed countries. The economically advanced countries therefore had a common interest in developing a protective device against these imports which they could, by common action, impose on the less-developed countries. I was able to negotiate the cotton textile agreement

¹⁰ Obviously, if the small countries had joined forces, they might have been able to credibly threaten retaliation. But the quota system could be used to punish any country that either led or joined such an effort.

only because the special situation of cotton textiles permitted me to organize the Atlantic nations into a common front to bring the low-wage producers into line.

The situation with respect to woolen textiles differed, he added, as the United States imported them almost exclusively from the United Kingdom, Italy, and Japan. Protecting this industry meant targeting “countries that are our principal allies and customers. In view of our heavily favorable trade balance with the UK and EEC our bargaining position would be very poor.”¹¹

Given the political goals that motivated the creation and operation of the postwar trade regime, however, it would be very surprising if market-failure theory alone sufficed to explain the trade expansion that it fostered. Even before 1945, for example, the United States sought to create a postwar trade organization that could help it to preempt the reemergence of trade blocs and to stabilize the continental balance of power. Absent these goals, it would be hard to explain, for example, why the United States supported the creation of the EEC, a European trade bloc that excluded it from membership and diluted its market power.

It would also be hard to explain the concern high-level officials often expressed about the adverse effects of protection on national security. During a 1959 National Security Council meeting, for example, President Eisenhower protested a proposed clothespin tariff because it would affect “no less than eleven foreign countries” even though the industry employed less than 300 workers, all of them in Maine. “Friendly foreign countries” as well as the United States itself, he noted, would be better off if these workers shifted to producing baseball bats.¹²

¹¹ Memorandum from Under Secretary of State to Secretary of State Dean Rusk, Kennedy Library, National Security Files, Kaysen Series, Trade Policy 1962.

¹²“Summary of 6/4/59 NSC meeting: effects of U.S. import trade policy on national security; and world developments affecting national security” (Declassified Documents 2008). The United States did not raise its tariffs on standard clothespins but did so on spring clothespins, compensating Sweden and Denmark (Operations of the Trade Agreements Program, Report (1958/59-1959/60), p. 15.

The link between trade and international politics finds expression in the theoretical literature in terms of the security externalities that trade generates—that is, the rise in potential political-military power that states realize as a result of the real income gains that trade produces. Because of these “security externalities,” states that are political-military allies have stronger incentives to trade freely with each other than do either neutrals or adversaries (Gowa and Mansfield 1992, Gowa 1994). Thus, for example, although the United States extended MFN rates to countries irrespective of their membership status, it did not do so in the case of imports “from most Communist countries and areas” (U.S. Tariff Commission 1965, 60).

As originally stated, the argument about alliances and trade applied exclusively to large countries, because the standard trade theory on which it is based assigns incentives to impose tariffs only to them.¹³ It was also institution free, as it assumed complete information. However, even making state behavior imperfectly observable would not necessarily create a role for the GATT/WTO, which essentially left “state parties to monitor each other” (Dai 2007, 54). This did not change with the 1989 adoption of the Trade Policy Review Mechanism, as the reports it mandated steered clear of compliance issues (Keesing 1998). Indeed, member governments objected to a recent announcement that the WTO would publicize policies inconsistent with its rules, arguing that it had no mandate to do so.¹⁴

As such, it seems that the GATT/WTO plays the same role in the case of large-state allies as it does in the case of large states more generally: it reduces the marginal cost of additional tariff rounds. In other cases, however, it can help to solve the time-consistency problem that recent trade theory illuminates. Assigning a central role to firm heterogeneity,

¹³Even in standard theory, the efficiency losses associated with a tariff can induce a large state to forego its use against small-state allies. Yet, this does not affect the small country’s policy, as free trade is its dominant strategy. I focus in the text on situations in which the actions small country actors take vary as a function of their alliance and GATT/WTO membership status.

¹⁴“Nations Rush to Establish New Barriers to Trade,” Wall Street Journal, 2/6/2009, p. A6.

the theory resolves a long-standing empirical puzzle—i.e., why only a small number of firms export their products. Export concentration occurs because only the most profitable firms can afford the sunk-costs investments required—e.g., setting up distribution networks, modifying and repackaging products, and collecting data about foreign-trade regulations (Melitz 2003; Tybout 2004; Das, Roberts, and Tybout 2007; Bernard et al. 2007, 114). Because only relatively efficient firms can absorb these costs, a previously unrecognized source of gains from trade exists: as output expands among exporting firms, factor prices rise, inducing the exit of less efficient firms and increasing industry productivity.

This variant of a virtuous cycle will occur, however, only under propitious political conditions. If a firm is to profit from exporting, it must be insured against the hold-up risk that its sunk-cost investment creates. This risk is greatest for small-country firms, as their governments cannot credibly threaten retaliation against a destination country that imposes a tariff *ex post* (McLaren 1997). A prospective importer can credibly commit itself to not to renege only if it has a stake in the welfare of its trading partner: in these cases, the efficiency losses a tariff imposes means that both states will be better off if the country of origin reaps the welfare gains that accrue from exporting than if the importing nation uses an import tax to shift profits *ex post*.

Alliances play a role here precisely because they endow states with an interest in joint welfare maximization. In cases in which coalitions include LDCs, GATT/WTO membership also matters, however, because waning political ties can lead an importing country to renege on its commitments. The regime can help to insure LDCs against this danger, because its dispute-resolution mechanism (DRM) endows them with a credible retaliatory threat.¹⁵ Although the WTO Dispute Settlement Understanding is “far more obligatory, automatic, and apolitical” than was its predecessor (Barton et al. 2006, 71), the GATT also offered its

¹⁵Davis and Bermeo (forthcoming) discuss LDC use of the DRM.

members routes to recompense, including informal bilateral negotiations. DRMs make less of a difference in the case of small industrial states, because the latter, as noted above, can free ride on the retaliatory power of their larger counterparts. As such, the fact that trade generates security externalities implies that allies should trade more freely with each other than do other states and that GATT/WTO membership should increase this effect when alliances include small states, particularly LDCs.

Thus, existing theories suggest that the processes that governed tariff bargaining under the GATT/WTO varied across its member countries. Large countries adhered to the principal-supplier rule and the practice of reciprocity. Allies, however, did not need to worry as much about either because of their interest in joint welfare maximization. This suggests that understanding the impact of the GATT/WTO requires disaggregating both its industrial-country and LDC member states. To do so, I turn to the data.

Empirical Analyses

I use a gravity model to analyze bilateral trade flows between 1946 and 2004. Thus, I estimate the logged value of the annual imports of each state in a country pair from the other as a function of the annual logged product of their output and population. Every analysis also includes dyadic fixed effects, as both recent theoretical analyses of the gravity model and concerns about unobserved heterogeneity recommend.¹⁶ Year fixed effects are also included to account for factors influencing trade that vary across time but are constant across dyads.

The covariate of principal interest is an indicator variable that assumes a value of one if both states in a dyad are GATT/WTO members, disaggregated as I describe below. As in GRT (2007a, 2007b), other dichotomous variables assign a value of one to dyads in which only one state is a member of the GATT/WTO and to country pairs that include two states

¹⁶ Thus, I do not include covariates that are constant across time (e.g., contiguity, landlocked, island) as they will drop out of any dyadic fixed-effect analysis.

that belong to a currency union, a reciprocal or unilateral PTA, or a GSP (an agreement that grant unilateral market access to LDCs).¹⁷ With two exceptions, I use the GRT data to measure these variables.

One of these is population, as their data set does not include it. This is so despite the fact that it is a standard element of gravity models whether or not dyadic fixed effects are included. I use the Penn World Tables to measure the logged annual value of the product of the population of the states in a dyad between 1950 and 2004 (Heston et al. 2006). For the years between 1946 and 1949, I rely on Angus Maddison's data.¹⁸ Population data exist for all but about 8000 observations in the sample.

GRT include a colonial-orbit variable to distinguish dyads that include an imperial power and its colony, two colonies of the same empire, or two former colonies of the same metropole (2007b, 51). However, this variable actually takes on a value of one only in the roughly 1600 observations of country pairs that include two members of an existing empire.¹⁹ Thus, I replace the GRT colonial variable with an indicator variable (*AnyColony*) that assigns a value of one to country pairs in which both states are current or former colonies of the same empire. In cases in which a colony is paired with its metropole, I assign a value of one to them only when their imperial ties still exist, because tariff cuts in conjunction with the MFN clause progressively diluted the preferences metropolises extended to their former colonies. There are about 22,000 current or former colonial dyads, accounting for about six percent of the sample.

It is important to note here that the GRT finding about the impact of the GATT/WTO on its members as a whole is robust to the inclusion of both the population variable and the

¹⁷ Unilateral PTAs provide one-way market access but are not GSPs (e.g., the Lome Convention) (GRT 2007b, 46).

¹⁸ <http://www.ggd.net/maddison>.

¹⁹ There are about 23 dyads that GRT code as members of a colonial orbit that I recode as zeroes (e.g., according to the CIA factbook, Egypt became independent in 1922 and Indonesia in 1945).

new colonial variable.²⁰ The same is true of the analyses in which they analyze dyads that include either two industrial countries or one industrial country and one LDC (2007b. 58). When I add population and the new colonial variable to the analysis, the trade of LDCs is about 39 percent higher than is that of base group; the corresponding GRT statistic is 33 percent. In the case of the analysis that estimates effects by accession type, NMP trade expansion relative to the base group rises from about 56 percent to about 80 percent, and the pair wise differences between this group and each of the other two groups become statistically significant (p-value = 0.002 in both cases).

The revised colonial variable also helps to explain the GRT finding that regime effects vary across these groups: the distribution of colonial dyads among them is highly skewed. They account for about 7 percent of formal-member dyads, 14 percent of mixed dyads, and 41 percent of NMP country pairs. As the GRT analyses as well as those below show that colonies trade much more with each other than do base-group members, it makes sense to ask whether it is the difference in the composition of the groups rather than in their mode of accession that account for the variation across them.

Table 1 reports the results of an analysis in which I disaggregate each group on the basis of the colonial status of their members—that is, I separate each of the three groups into current or former colonial dyads and other country pairs. Thus, I construct three variables that assign a value of one to the colonial dyads in each of the formal-member, mixed-dyad, and NMP group. I also include three indicator variables for each group purged of its colonial dyads. The results show that absent colonial dyads, cross-group variation narrows: the increase in trade between formal members is about 42 percent; it is about 45 percent for mixed dyads and about 52 percent for NMPs. None of the pair wise differences between the

²⁰ Complete results for all analyses I report only in the text are available from the author.

groups is any longer statistically significant, however.²¹ Thus, the GRT intuition is correct: the route of accession does not matter.

Market-failure theory

To test market-failure theory, I estimate a model that disaggregates members into three groups. In one group are dyads made of the five largest industrial states paired with each other (*Core states*). In another are relatively small industrial-country members paired either with each other or with a core state (*Other industrial states*). In the third group are all other country pairs that include two member states (*Nonindustrial states*). As is standard, I also control for dyads that include only one GATT/WTO member (*Onein states*). Because market-failure theory predicts that free riding will privilege industrial states in this group, however, I subdivide onein dyads into two groups: one includes only industrial states (*Onein/industrial states*), while the second includes all remaining onein dyads (*Onein/nonindustrial states*). In the first group are, for example, France and Spain before 1963 and Britain and Portugal before 1962.

As in the GRT and Rose papers, I use the IMF coding to define as industrialized the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, the United Kingdom, the United States, and Yugoslavia (until 1992).²² I assign to the core group the states among them that have consistently had the largest output over the postwar era, as they wield the

²¹ The p-value for the difference between formal and NMP dyads is 0.35; for mixed and NMP dyads is 0.51; and for formal and mixed dyads is 0.35.

²²The COW data set changes the coding of Yugoslavia as of 1991. The IMF also replaces Yugoslav trade data with successor-state data beginning in 1992. GRT code Yugoslavia as an industrial-country through 1992. Following the COW and IMF coding, I remove Yugoslavia from industrial-country status beginning in 1992.

greatest amount of market power—i.e., Britain, France, Germany, Japan, and the United States. In this group are 1082 dyads, about one-half of one percent of member dyads.²³

All other industrial-country pairs are in the second group. They include, for example, a dyad composed of Austria and Switzerland, as well as a U.S.-Austria pair. There are about 23,000 country pairs in this group, representing about 10.5 percent of GATT/WTO members. Finally, the third group includes all other GATT/WTO country pairs—that is, those with either one industrial country and one LDC or two LDCs. About 89 percent of all GATT/WTO member dyads are in the third group.

In Table 2, I report the result of an analysis that disaggregates GATT/WTO members but that also includes the set of covariates I noted above. In the text, I interpret the coefficients on the dichotomous variables as the percentage change in trade (i.e., $e^{\beta} - 1$) relative to the base group. The model I estimate is:

$$\begin{aligned} \ln(\text{imports})_{ijt} = & \alpha + \beta_{1ijt}(\text{Core states}) + \beta_{2ijt}(\text{Other-industrial states}) \\ & + \beta_{3ijt}(\text{Nonindustrial states}) + \beta_{4ijt}(\text{Onein/ industrial states}) \\ & + \beta_{5ijt}(\text{Onein/nonindustrial states}) + \beta_{6ijt}(\text{PTArecip}) + \beta_{7ijt}(\text{PTAunilat}) \\ & + \beta_{8ijt}(\text{CurrencyUnion}) + \beta_{9ijt}(\text{GSP}) + \beta_{10ijt}(\text{AnyColony}) \\ & + \beta_{11ijt}(\ln(\text{gdp}_i * \text{gdp}_j)) + \beta_{12ijt}(\ln(\text{pop}_i * \text{pop}_j)) + \mu_{ij} + \sum \delta_t \text{Year}_t + \varepsilon_{ijt} \quad (1) \end{aligned}$$

The results in the first column of Table 2 are consistent with market-failure theory: the regime exerts its strongest impact on trade between core states, which is three times as high as is trade between-base group states. Trade between states in the other-industrial group is more than double that of base-group states (p-value ≤ 0.0001 in each case).²⁴ The corresponding statistic for other member states is almost 40 percent. The difference between

²³ Gowa and Kim (2005) include Canada and exclude Japan from their “privileged” group. However, Japan’s GDP exceeds that of Canada and other core states (except for the United States) for almost all years in the sample. Canadian output is consistently below that of any other core-group member. Calculated from the Penn World Tables (Heston et al. 2006).

²⁴ Unless I state otherwise, all statistics I report in the text are significant with p-values ≤ 0.0001 .

each treatment group and the base group is statistically significant, and pair wise comparisons show that the differences between the groups themselves are also significant.

The results in Table 2, col. (1), also show that the effect of industrial-country status extends to dyads in which only one country is a GATT/WTO member (i.e., *Onein/industrial states*). Trade between these states is about 46 percent higher than is trade between base-group members. Indeed, neither a substantive nor statistically significant difference exists between the trade of these “onein” dyads and trade between the 90 percent of GATT/WTO member dyads that include at least one LDC (p-value = 0.48). These results are consistent with the claim that market-failure theory makes about the dominance of industrial states in the postwar regime.

Table 2 shows that dyadic income exerts a large, positive, and significant impact on bilateral trade flows. It also makes clear that trade-related groups other than the GATT/WTO also matter. Most notably, current or former members of colonial empires trade more than twice as much with each other as do states in the base group. The corresponding statistics for reciprocal PTAs and currency unions are about 40 percent and 65 percent, respectively. Both unilateral PTAs and GSPs exert small negative effects on trade (p-values = 0.06 and ≤ 0.0001 , respectively). Although their de jure purpose is to increase LDC exports, in practice these agreements tightly constrained both the products and countries eligible for special treatment.

The logic of the principal-supplier rule and core-group efforts to extract compensation during settling-up talks suggest that differences may also exist between two subsets of states in the other-industrial group. In the settling-up talks, each core state sought compensation for any benefits its tariff cuts endowed on other states. This implies that trade expansion should be larger between core states and smaller industrial countries than between the latter. To test this idea, I subdivide the set of other-industrial regime members into two groups: 1) core

states paired with relatively small industrial countries, and 2) small industrial states paired with each other.

Table 2, col. 2, reports the results of an analysis that includes both groups. In the interest of clarity, I report only the estimates on the dyad-group variables--other coefficients are identical to those in the first column. As before, trade between core-group members exceeds that of base-group countries by a factor of three. Trade between members of other industrial-country pairs varies as predicted: it increases by about 170 percent in the case of large/small states pairs and by about 115 percent in the case of small-small state dyads. This difference is both substantively large and statistically significant (p-value = 0.002).²⁵

Thus, the evidence that Table 2 presents is consistent with the prediction of market-failure theory that regime effects will vary systematically across industrial countries and LDCs. It also shows that, as the theory predicts, regime effects also vary within this set: e.g., the largest industrial countries gain much more than their smaller counterparts, while even nonmember industrial countries witness an expansion of their trade.

Security externalities

The theory does not predict, however, the impact that the GATT/WTO exerts on LDC trade. As the GRT analyses and Table 2 show, trade between dyads that include at least one LDC is about 40 percent higher than is base-group trade. Although recent work finds that some LDCs exert market power with respect to some goods (e.g., Broda, Limão, and Weinstein 2006), it is clear that these countries were not central players in postwar tariff bargaining. To examine whether the theory linking trade to security can help to explain the LDC results, I create a variable that takes on a value of one when both states in a country pair

²⁵ The difference between the core-group and the core-small industrial states is also significant (p-value = 0.002).

are allies.²⁶ I then interact this term with each of the three GATT/WTO country groups.

Thus, I distinguish: 1) allied core states, 2) allied pairs in the other-industrial group allies, and 2) nonindustrial country-pair allies. To be consistent with the theory, the data should show: 1) that allies trade more with each other than do base-group states; and 2) that allies that are also GATT/WTO members, especially when one of them is an LDC, trade more with each other than do other allies.

The results in the first column of Table 3 show that allies trade about 17 percent more with each other than do base-group members. The regime, however, does not increase the trade of core-state allies relative to other states in the core group (p-value = 0.65), perhaps because alliance status varies little among them: four of them are NATO members, and the fifth, Japan, is a long-time U.S. ally. Allies in the other-industrial country group trade about 20 percent more with each other than do other states in the same group, a difference that is marginally significant (p-value = 0.07). As the theory predicts, the regime exerts its strongest effect on nonindustrial-country pairs. Allied countries in this group trade about three times more with each other than do other dyads.²⁷

That it is the GATT/WTO insurance mechanism that matters emerges more clearly if I distinguish between states based on their ability to avail themselves of it. NMPs had access to the same basic privileges as did formal members, but the de facto members among them did not have the “right to assistance in resolving disputes between themselves and contracting parties regarding the interpretation of the agreement” (GRT 2007 b, 42, n 15). This implies that, if the theory is correct, the regime should not affect trade between allies if at least one of

²⁶I use data from the Alliance Treaty Obligations and Provisions Project (<http://atop.rice.edu>). As these data end in 2003, the analyses that include alliances end in that year.

²⁷No difference exists if I break down nonindustrial-country pair into dyads that include one LDC and one industrial state and country pairs made up of two LDCs.

them is a de facto member. Because all de facto members are former colonies, they are a subset of nonindustrial dyads.

Thus, I add to the analysis a variable that assumes a value of one in instances in which GATT/WTO member dyads include at least one de facto member. I also add another variable that interacts these dyads with the alliance variable. The results in Table 3, col. (2), show that regime membership does not affect trade between allies if either of them is a de facto member (p-value = 0.60). Thus, in cases involving LDC trade, GATT/WTO membership magnifies the impact of alliances only if the states they link can actually utilize the insurance against reneging that it provides.

Finally, the theory also implies that the effect on trade of alliance termination should vary with regime membership—that is, trade should decline as alliances end only if the states they linked did not adhere to the GATT/WTO. Table 3, col. (3), reports the results of an analysis that distinguishes between former allies on this basis. Thus, it includes a variable that assumes a value of one when former allies are regime members and another variable that takes on a value of one in other cases of former allies. The results show that no change in trade occurs if former allies are regime members (p-value = 0.162). In other cases of former allies, however, trade drops off by about 40 percent.²⁸ These data are consistent with the existence of a mechanism that helps to insure LDCs against the reneging that can ensue following the end of an alliance.

The results in Table 3 also help to explain more precisely the finding in the GRT papers about LDCs. Absent alliance ties, the regime effects a relatively modest change in their trade, raising it by about 30 percent relative to the base group. This is about 10 percent of the trade expansion large industrial countries realize and about 25 percent of the increase in trade of country pairs in the other-industrial groups. Indeed, even one in dyads that include

²⁸ Almost all of the latter involve nonindustrial dyads, and their trade does not vary significantly from that of current allies (p-value = 0.16).

an LDC witness a 20 percent expansion of their trade. However, the joint impact of alliances and regime membership on LDC trade is much more substantial: trade in these cases more than doubles relative to the base group, making the increase in their trade only marginally different from that of the other-industrial group (p-value = 0.06).

Robustness Tests

Here, I report on the sensitivity of the results presented above to changes in the specification of the model. First, I examine the results of the analysis that tests the empirical implications of market-failure theory—i.e., that which produces the results I report in the first column of Table 2.²⁹ These results are robust to restricting the period examined to the years in which the GATT existed; including a structural break for the 1995 advent of the WTO and covariates that interact each of the three member groups with the WTO term; and adding Canada to the core group.

They are also robust to including a covariate that assumes a value of one when a PTA includes two EU members. The EU exerts a large, significant, and variable impact on trade between its members. As market-failure theory predicts, trade between its largest members—i.e., Britain, France, and Germany--increases by about 135 percent relative to base-group members; the corresponding statistic for trade between other EU member states is 77; and the difference between them is significant. In both cases, the EU effect is stronger than is that of other reciprocal PTAs, which increase their members' trade by about 35 percent.

The alliance results that column 1 of Table 3 reports are also robust to restricting the analysis to the years in which the GATT existed and to including a structural break for the advent of the WTO. The same is true if I distinguish between the impact of alliances that include the United States among its members and all other alliances. That this might matter is suggested by especially large role the United States played throughout the history of the

²⁹ Complete results for all robustness tests are available from the author.

GATT/WTO and by the fact that about 80 percent of all postwar alliances include the United States as a member.

Conclusion

The results in this paper show that testing the empirical implications of existing theories produces a very rich picture of the effects of the postwar regime. In accord with market-failure theory, trade expanded most dramatically between its largest industrial-country members and to a lesser extent between other industrial countries. In the case of the other 90 percent of GATT/WTO member dyads, taking security externalities into account makes a big difference. A regime effect comparable in magnitude to any industrial-country effect can be found only in the relatively small number of these cases that alliances link—i.e., about 11 percent of nonindustrial dyads.

Thus, two processes seem to have governed trade expansion under the auspices of the postwar regime. In one, the indefinite horizon that the GATT/WTO helped to create enabled large states to escape the tariffs that a single-shot PD game inevitably produces. In the other, the regime provided small-state allies with the contemporary equivalent of a medieval merchant guild, endowing them with the ability to retaliate and to capture welfare gains in excess of those that standard theory predicts (Greif, Milgrom and Weingast 1994; Greif 2006). As such, this paper suggest that taking account of the ways in which politics can affect the distribution of benefits increases the value added of measuring the impact of international regimes.

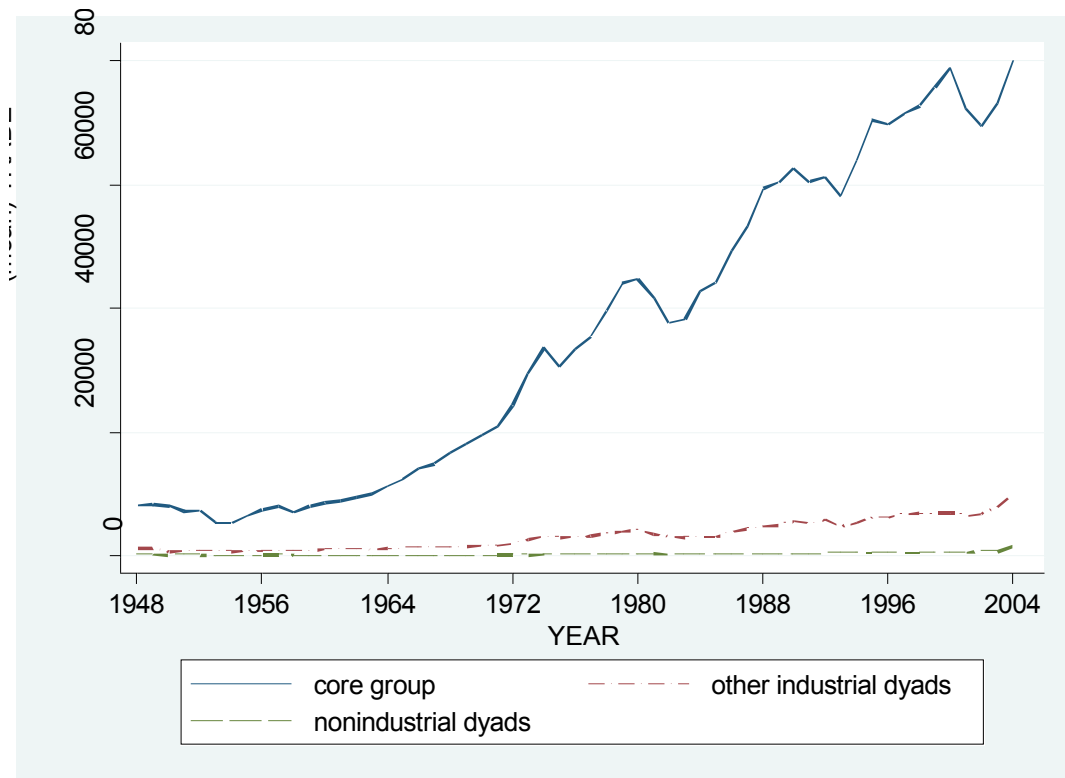
References

- Bagwell, Kyle and Robert W. Staiger. 2002. The Economics of the World Trading System. Cambridge, MIT Press. London: MIT Press.
- Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott. 2007. Firms in International Trade. Journal of Economic Perspectives 21,3:105-30.
- Barton, John H. et al. 2006. The Evolution of the Trade Regime. Princeton: Princeton University Press.
- Broda, Christian, Numo Limão and David Weinstein. 2006. NBER working paper series, no. w12033. Cambridge, MA: National Bureau of Economic Research.
- Dai, Xinyuan. 2007. International Institutions and National Policies. Cambridge University Press.
- Das, Sanghamitra, Mark J. Roberts and James R. Tybout. 2007. Market Entry Costs, Producer Heterogeneity, and Export Dynamics, Econometrica, Econometric Society 75 (3): 837-73.
- Davis, Christina L. and Sarah Blodgett Bermeo. Forthcoming. Who Files? Developing Country Participation in GATT/WTO Adjudication. Journal of Politics.
- Declassified Documents Reference System. 2008. Farmington Hills, MI: Gale.
- Ethier, Wilfred J. 2001. Theoretical Problems in Negotiating Trade Liberalization. European Journal of Political Economy 17: 209-32.
- Goldstein, Judith L., Douglas Rivers and Michael Tomz. 2007. Do We Really Know That the WTO Increases Trade? Comment. The American Economic Review 97.5: 2005-18.
- _____. 2007b. Institutions in International Relations: Understanding the Effects of the GATT and the WTO on World Trade. International Organization 61,1 (Winter): 37-67.
- Gowa, Joanne and Soo Yeon Kim. 2005. An Exclusive Country Club: The Effects of the GATT on Trade, 1950-94. World Politics 57, 4 (July): 453-78.
- Gowa, Joanne. 1994. Allies, Adversaries, and International Trade. Princeton, N.J.: Princeton University Press.
- _____. and Edward D. Mansfield. 1993. Power Politics and International Trade. American Political Science Review 87, 2: 408-20.
- Greif, Avner. 2006. Institutions and the Path to Economic Modernity: Lessons from Medieval Trade. NY: Cambridge University Press.

- Greif, Avner, Paul Milgrom and Barry R. Weingast. 1994. Coordination, Commitment and Enforcement: The Case of the Merchant Guild, Journal of Political Economy, 10 (4): 745-776.
- Heston, Alan, Robert Summers and Bettina Aten. 2006., Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.
- Hoda, Anwarul. 2001. Tariff Negotiations and Renegotiations Under the GATT and the WTO: Procedures and Practices. NY: Cambridge University Press.
- Hoekman, Bernard M. and Petros C. Mavroides. 2007. The WTO: Law, Economics, and Politics. London: Routledge.
- Keohane, Robert O. 1994. After Hegemony: Cooperation and Discord in the World Political Economy. Princeton: Princeton University Press.
- Keesing, Donald B. 1998. Improving Trade Policy Reviews in the World Trade Organization. Policy Analyses in International Economics 52. Washington, D.C. : Peterson Institute for International Economics.
- Maddison, Angus. 2008. Historical Statistics for the World Economy: 1-2006 AD. <http://www.ggdc.net/maddison>.
- McLaren, John. 1997. Size, Sunk Costs, and Judge Bowker's Objection to Free Trade. American Economic Review 87, 3(June): 400-20.
- Melitz, Mark, 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. Econometrica 71, 6: 1695-1725.
- Memorandum. Discussion at the 409th Meeting of the NSC. June 14, 1959. Declassified Documents Reference System. 2008. Farmington Hills, MI: Gale.
- Memorandum from John Foster Dulles to the President, July 12, 1954. Declassified Documents Reference System. 2008. Farmington Hills, MI: Gale.
- Rose, Andrew K. 2004. Do We Really Know That the WTO Increases Trade? The American Economic Review 94, 1 (March): 98-114
- _____. 2007. Do We Really Know That the WTO Increases Trade? Reply. American Economic Review 97,5:20019-26.
- Subramanian, Arvind and Shang-Jin Wei. 2007. The WTO Promotes Trade, Strongly but Unevenly. Journal of International Economics. Elsevier. 72, 1 (May) 151-175.
- Summary of 6/4/59 NSC meeting: Effect of U.S. import trade policy on national security; and world developments affecting national security. Miscellaneous. National Security Council. SECRET. Issue date: June 4, 1959. Declassified Documents Reference System. 2008. Farmington Hills, MI: Gale.

- Trebilcock, Michael J., and R. Howse 1999. The Regulation of International Trade, Routledge, London; NY.
- Tybout, James R. 2004. Trade Policy and Industrial Sector Responses: Using Evolutionary Models to Interpret the Evidence, with Erkan Erdem, in Susan Collins and Dani Rodrick, eds., Brookings Trade Forum 2003 Washington, D.C.: The Brookings Institution.
- U.S. Tariff Commission. 1965. Operation of the Trade Agreements Program, v. 15 1962/63. GPO: Washington, D.C.
- U.S. Tariff Commission. 1964. Operation of the Trade Agreements Program, 24th Report July 1960-June 1962. GPO: Washington, D.C.
- Wilkinson, Rorden and James Scott. 2008. Developing Country Participation in the GATT: A Reassessment. World Trade Review 7,3: 473-510.
- Winham, Gilbert. 1986. International Trade and the Tokyo Round Negotiation. Princeton: Princeton University Press.

Figure 1. Trade between Core-group Members, Other Industrial Countries, and LDC Dyads, 1948-2004^a



^a Units in \$100000.

**Table 1. Bilateral Trade, 1946-2004
Formal Member, Mixed Dyads, and NMPs by Colonial Status**

No colonial pairs	
Formal-members	0.35 (0.03)
Mixed dyads/no colony pair	0.37 (0.04)
NMP	0.42 (0.08)
Colony pairs	
Formal members	-0.06 (0.09)
Mixed dyads	0.16 (0.09)
NMPs	0.60 (0.24)
All colonial pairs	0.96 (0.15)
R ²	0.84
N	373208

Note: Regressand: logged bilateral trade flows. Fixed-effects analysis using *areg* in Stata 10 with standard errors clustered on directed dyads in parentheses. Controls for PTAs, currency unions, GSPs, GDP, population, and dyad and year fixed effects included.

Table 2. The Impact of the GATT/WTO/WTO on Trade, 1946-2004

	(1) ^a	(2) ^b
GATT/WTO members		
Core group	1.41 (0.21)	1.42 (0.21)
Other industrial states	0.82 (0.07)	
Big-small		0.99 (0.10)
Small-small		0.77 (0.08)
Nonindustrial states	0.33 (0.03)	0.33 (0.03)
Onein-industrial dyads	0.39 (0.07)	
Onein/other dyads	0.19 (0.03)	
Reciprocal PTA	0.32 (0.02)	
Nonreciprocal PTA	-0.06 (0.03)	
GSP	-0.08 (0.02)	
Currency union	0.53 (0.09)	
Colonies	0.77 (0.14)	
GDP	0.65 (0.01)	
Population	0.03 (0.03)	
R ²	0.84	0.84
N	373728	373728

Note: Regressand: logged bilateral trade flows. Fixed-effects analysis using *areg* in Stata 10 with standard errors clustered on directed dyads in parentheses. Dyadic and year fixed effects included but not reported. ^bControls for PTAs, currency unions, GSPs, colonies, GDP, population, and dyad and year fixed effects included.

Table 3. The Impact of the GATT/WTO and Alliances on Trade, 1946-2003

	(1)	(2)	(3)
GATT/WTO members			
Core group	1.37 (0.22)	1.37 (0.22)	1.37 (0.22)
allies	-0.04 (0.22)	-0.04 (0.22)	-0.03 (0.22)
Other industrial states	0.81 (0.07)	0.80 (0.07)	0.80 (0.07)
allies	-0.07 (0.06)	-0.08 (0.06)	-0.07 (0.06)
Nonindustrial states	0.27 (0.04)	0.26 (0.04)	0.27 (0.04)
allies	0.23 (0.04)	0.24 (0.04)	0.23 (0.04)
Nonindustrial states/de facto		0.35 (0.04)	
allies		-0.11 (0.10)	
Alliances	0.16 (0.04)	0.16 (0.04)	0.15 (0.04)
Former allies/member states			0.10 (0.07)
Former allies/nonmember states			-0.49 (0.12)
R ²		0.83	
N		371705	

Note: Regressand: logged bilateral trade flows. Fixed-effects analysis using *areg* in Stata 10 with standard errors clustered on directed dyads in parentheses. Controls for PTAs, currency unions, GSPs, colonies, GDP, population, and dyad and year fixed effects included.