

## Notes on International Trade Institutions

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Modern thinking about international institutions has an influential strand that sees them as devices to escape a Prisoners' Dilemma of international economic relations. (See Kyle Bagwell and Robert Staiger, *The Economics of the World Trading System*, MIT Press, 2002.) Each national government acting in its own interest will choose a trade policy which inflicts negative externalities on its trading partners. The Nash equilibrium of such a game will result in inefficient trade. The inefficiency can be avoided by agreeing 'in advance' to be bound by rules of the game in setting trade policy.

The most prominent example of the Prisoner's Dilemma trade war equilibrium is the collapse of trade in the 1930's. A cycle of retaliation and counter-retaliation in trade policies was set in motion when countries attempted to manipulate their trade and exchange rate policies to raise real income as a world wide recession began. In the US., the Smoot-Hawley Tariff of 1930 raised tariffs to historic highs and other nations followed suit. FDR's taking the US off the gold standard in 1933 (and refusal to cooperate in monetary confidence building efforts internationally) led to competitive devaluations which acted similarly to tariff wars. (A devaluation is equivalent to a uniform tax on imports and subsidy on exports.) The trade wars of the 30's reinforced the already autarkic tendencies of the fascist countries (Germany, Italy, Japan). Mutually autarkic policies between the Soviet Union and the democracies had been in place since the 1920's.

The trade war of the 30's was fresh in the minds of the architects of the post-war international institutions as they met at Bretton Woods in 1944. They wanted to lay foundations for better economic outcomes in the belief that a more peaceful world would result.

Avoidance of exchange rate manipulations for selfish national interests was the primary reason for the Bretton Woods monetary system of adjustably pegged exchange rates, with rules for

consultation and mutual aid against exchange rate runs by speculators. The International Monetary Fund was designed to aid this process.

The other pillar of the post-war institutions envisioned at Bretton Woods was to be an international trade organization to govern the setting of tariffs and other trade policy instruments. The US had begun trade liberalization efforts under the Reciprocal Trade Agreements Act of 1934, empowering the President to negotiate reciprocal tariff cuts bilaterally with trade partners. The Bretton Woods version of the plan was unrealized due to Congressional protectionist opposition in the US. A crippled version of the original idea came about as an executive agreement on the US side, collectively called the General Agreement on Tariffs and Trade (GATT). GATT regularized reciprocal trade agreements with a non-discrimination Most-Favored-Nation (MFN) constraint.<sup>1</sup> Eventually, something like the original plan was realized in the creation of the World Trade Organization (WTO) on Jan. 1, 1995.

These notes outline why trade agreements might be beneficial and then it describes an economic rationale for the GATT/WTO framework. The rationale shows that there are benefits delivered to participants. Thus it provides a Darwinian reason (only fit institutions survive) for the survival and growth of the GATT/WTO.

First comes a formal description of the trade policy game between 2 governments. Then comes a description of the usefulness of the GATT/WTO rules in avoiding inefficient trade policy equilibria.

## **Nash Equilibrium Trade Policies**

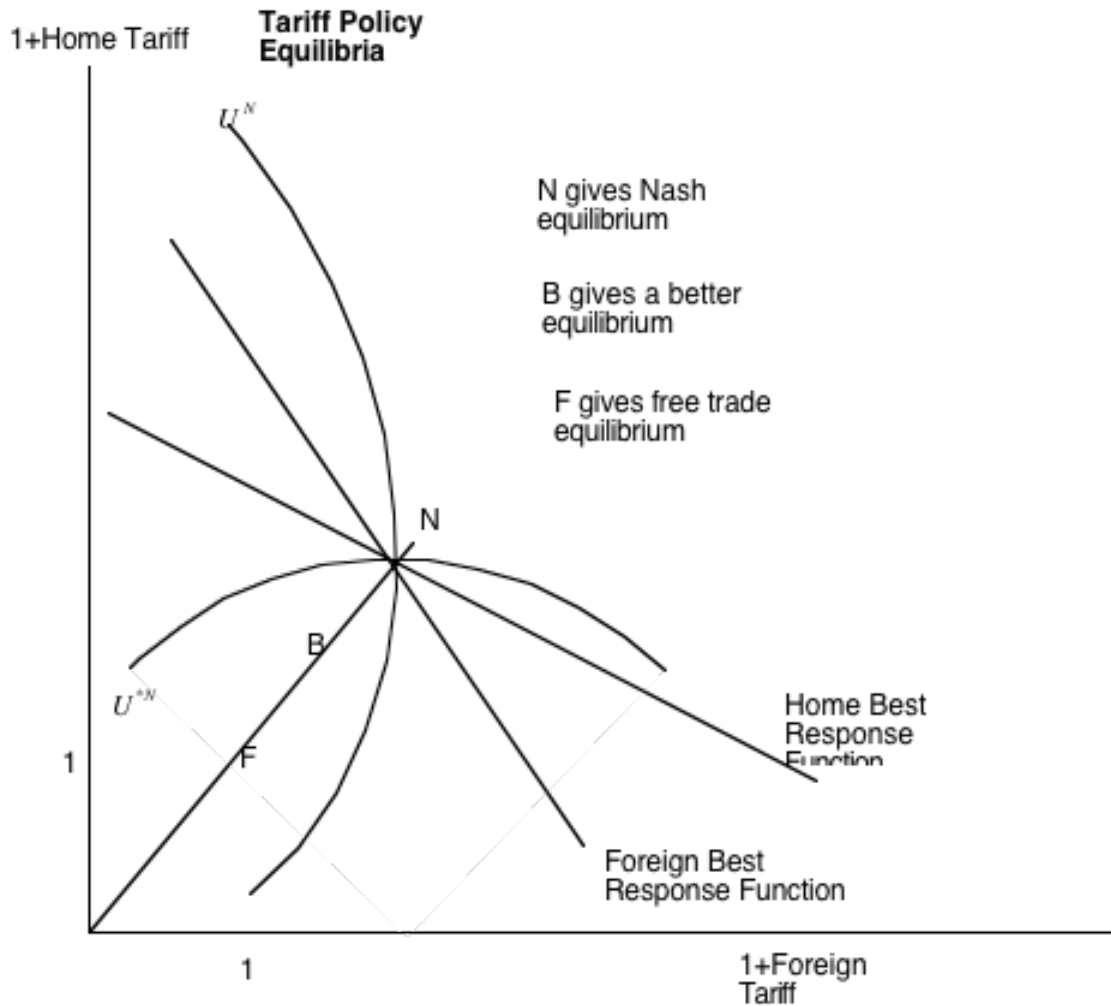
The setting is that nationalistic trade policy makers set tariffs in a game in which increases in tariffs inflict negative externalities on partner countries. This is an example of a game where the strategies are continuous (i.e., there are infinitely many strategies and any particular strategy lies very close to some other strategy).

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<sup>1</sup> Each nation is to receive the same treatment as the Most Favored Nation.

The analysis is presented in a very useful diagram of the best response functions of the players in the space of tariffs. It is convenient to set the diagrammatic analysis in the space of tariff factors, one plus the ad valorem tariff rates. The two players, Home and Foreign, have preferences over tariff factors. Generally speaking they prefer lower tariffs by the other player. For themselves, their utility increases with their own tariff in some range above zero for a given tariff by Foreign, and then eventually hits a maximum, after which utility declines. At a zero tariff, free trade, if a small tariff improves the terms of trade, utility must be rising in the tariff. At a prohibitive tariff with no trade, reducing the tariff must garner some gains from trade. Somewhere in between is the optimal tariff given the foreign tariff. These considerations imply indifference curves as shown in the diagram, where the best response tariff of Home to the Foreign tariff in Nash equilibrium is given by the vertical line tangent (not shown) to  $U^N$  at point N. All Home indifference curves to the left of N are associated with higher utility because the foreign tariff is lower. Similarly, the foreign indifference curve  $U^{*N}$  is tangent to the horizontal line (not shown) at point N, with higher foreign utility as Home tariffs are lower.

It is plausible (for reasons which are not of immediate concern) that in this game, tariff policies are strategic substitutes --- a higher tariff by the Foreign player will lower the best response tariff by the Home player and vice versa. Best response is defined to be the utility maximizing tariff for the player, given the tariff of the other player. In strategic substitutes case the diagram below applies.



The diagram is full of information. Point N is the Nash equilibrium tariff point. A better equilibrium lies at B, inside the lens formed by the indifference curves for the two players. Any point such as B leads to higher utility for both players. Free trade lies at point F. As drawn, point B lies on the ray from the origin through free trade point F and through point N. This is the very special case where the Nash equilibrium tariffs are equal, countries are symmetric.

Point F need not even be in the lens (a case not shown), meaning that free trade need not be better than N for at least one of the players. Whether free trade at F is better than the Nash equilibrium N depends on the governments' objectives. Political economy considerations usually mean that some protection may be unavoidable due to pressure group politics. Whatever the

nature of the government objectives, however, the GATT/WTO process can deliver better outcomes than if each country goes at trade policy making separately, resulting in the Prisoners Dilemma game's bad equilibrium.

## Trade Agreements

International trade agreements are understood as *commitment devices*, through which the parties agree to commit to a tariff deal, a point in the space above. An efficient tariff deal should not only be mutually beneficial, hence inside the lens. The most efficient tariffs are associated with a tangency of indifference curves. The locus of these tangencies is a 'contract locus' (not drawn).

One way to reach the contract locus from any starting would be for the parties to efficiently bargain over tariffs. Depending on their bargaining strengths, the outcome will be more or less favorable, but any acceptable bargain makes both parties better off and will be on the contract locus of efficient tariffs.

NOTICE THAT COMMITMENT IS ASSUMED. In practice, commitment to the agreement is crucial. How can sovereign governments be committed? One answer is "self-enforcing agreements". Reneging on an agreement obtains a short term gain (the off-diagonal payoffs in the Prisoners' Dilemma) but the rest of the future reverts to Nash payoffs. Balancing the incentive to renege against the value of staying in the agreement, at least some moderate tariff reduction is "self-enforcing" in the sense that neither party would renege.

## GATT/WTO

International institutions such as the GATT/WTO can be understood as *rule-based commitment devices*. The parties agree to a set of rules to govern their interactions. Tariff deals under the rules reduce the tariffs while the rules permit shifting the tariffs back up again under contingencies that are permissible reasons.

Disputes over permissible reasons for tariff escalation are agreed to be settled by an international dispute settlement process.

Unlike national court systems, the WTO dispute settlement panel has no ultimate enforcement power. The commitment problem arises again. But, in practice the commitment to stay within the rule based system seems to be very strong. Countries do not renege and rarely do they even finally choose to raise tariffs and accept the higher tariffs that reciprocate from their partners. The GATT/WTO system emphasizes reciprocity, which seems to go against the interest of the most powerful countries (which are the largest economies). Why then are they (especially the US, which started the whole process and was always its strongest backer) willing to enter such rule based commitments?

Here is a tentative and informal answer. Stark power based bargaining seems to be very costly, threatening a breakdown of a wide range of social relationships. Rules seem to be a way of lowering the potential costs by constraining in advance the more extreme outcomes that might otherwise arise. In the international arena, countries interact in law enforcement (extradition, exchange of information, countering piracy), disease control, mutual aid, climate issues, fisheries management, ... In each case, rules are adopted that restrict the range of actions. The rules are to some degree arbitrary and the outcomes need not correspond to standard ideas of fairness. Countries stick to the rules in individual cases where it may be disadvantageous because they foresee greater losses in the future if they choose to flagrantly violate rule-constrained behavior in the present.

### **The GATT/WTO Reciprocity Rules**

In reality, the reciprocity of GATT rules is not applied directly to equal sized tariff reductions (as it is in the diagram) but rather on equal sized changes in trade volume. The GATT/WTO emphasis is on the *reciprocal exchange of market access*. Paul Krugman (in some of his writing) has derided this idea as “GATT-think”, and pointed out its relation to mercantilism. Mercantilism thinks of exports as good and imports as bad, exactly the reverse of the usual economic logic.

Bagwell and Staiger (*The Economics of the World Trading System*, MIT Press, 2002) argue that the reason for the GATT reciprocity rule is that equal sized changes in imports and exports will permit tariff reductions to proceed without changing the international terms of trade. Then each nation can selfishly set tariff policies, but subject to the reciprocity rule which neutralizes the international externality. In acting this way simultaneously, the countries escape the Prisoner's Dilemma. This kind of reciprocal trade rule can accommodate occasional outbreaks of protectionism without setting off a trade war (that is, the agreement is still maintained because reciprocity is preserved).

To see more deeply into the Bagwell and Staiger argument, we first consider each government's national interest. Suppose that each nation values sectoral employment in its import competing industry beyond its contribution to national income (which goes into the standard cost/benefit calculation). This sectoral employment has value  $w^0$  in the home country. The marginal net benefit of changing the home country tariff *exclusive* of the terms of trade change works out to be

$$B_t = \left[ t \frac{d(D_w - Q_w)}{dP_w} + w^0 \frac{dL_w}{dP_w} \right] \frac{dP_w}{dt}$$

The first term in brackets is the marginal dead weight loss, negative because import demand curves slope downward. The second, positive, term is the sectoral wage times the change in the demand for sectoral labor induced by the price change. The bracket term is multiplied by the rate of change of the domestic (internal) price induced by the tariff change.  $dP_w / dt$  depends on the slopes of both import demand and export supply curves. For a small country,  $dP_w / dt = 1$  while for a large country it can be shown that  $dP_w / dt < 1$ . This less than complete passthrough arises because the foreigner is paying part of the tax:  $dP_w - dP_w^* = dt$ . The resulting fall in the external price of imports improves Home's terms of trade,  $dP_w^* / dt < 0$ .

Without constraint from a trade agreement, national interest is maximized by setting tariffs so that the national marginal benefit  $B_i + (D_w - Q_w)dP_w^* / dt = 0$ , where the second term on the left hand side of the equation is the terms of trade effect. Nash equilibrium results when this national interest maximizing rule for the home country is combined with a similar expression for the foreign country.

A hypothetical world social planner would realize that a change in the world terms of trade will help one country and harm the other country in exactly offsetting fashion. Thus the terms of trade effects net out of world welfare. The planner would choose the pair of tariffs  $t, t^*$  such that marginal net benefit in each country *exclusive* of the terms of trade effect is simultaneously equal to zero  $B_i = 0 = B_i^*$ .

Under the GATT reciprocity rule, each country is free to set its tariff subject to reciprocity, which freezes the terms of trade:  $dP^*=0$ . Reciprocity applies on the way up as part of the rules. For negotiation on the way down, reciprocity is not in the rules, the parties are not so constrained, but in practice the tariff cuts are negotiated to achieve this reciprocity.

Subject to reciprocity the selfish national calculation becomes the same as when the global social net cost or benefit  $B_i$  is equal to zero. When both countries do this simultaneously because of reciprocity, the selfish nations reproduce the efficient world social planner's equilibrium. In terms of the diagram, an efficient equilibrium lies inside the lens at a point where the indifference curves are tangent. There are many such points on the 'contract locus', while the GATT rule moves from N toward one such point.

Proof that the terms of trade remain constant under the GATT/WTO rule is simple. The balanced trade constraint of standard simple trade theory requires that

$(D_w - Q_w)P_w^{world} / P_C^{world} = Q_C - D_C$ ; the value of imports at world prices must equal the value of exports at world prices. Then equal changes in the quantities on either side of the equation due to



changes in domestic prices caused by tariff changes in each country will permit the equation to hold with constant world relative price.

Restating the key insight of Bagwell and Staiger, the GATT/WTO reciprocity rules imply that the nationalistic calculation of marginal net benefit must leave out the benefit which comes from making foreigners bear some of the incidence of the tariff. Two nations setting trade policies nationalistically but subject to the rules will arrive at efficient trade policies.

Note well that the WTO rules apply to reciprocity on the way up as well as the way down. When internal conditions shift such that one country raises its politically optimal tariffs, the other country will reciprocally raise its politically optimal tariffs. This is sanctioned by the WTO rules. When a WTO panel rules that a particular nation's trade practice violates its obligation to provide market access to its partner, the 'victim' of the violation is permitted to raise its tariffs to take away an equal amount of market access, but no more. The WTO 'contract' is unusual in that it anticipates violations and specifies a mechanism of 'compensation'. Such disputes, even though acrimonious, are all within the GATT/WTO framework and do not threaten an outbreak of trade wars.

A recent example of how this all works in practice is the US steel tariffs imposed by Pres. G.W. Bush. A WTO provision allows for temporary protection with no retaliation if imports are a principal cause of unemployment. The US steel industry did not qualify because its employment problems were due to technological change. The WTO dispute panel ruled, correctly, that this was the case. The US could have kept the steel tariffs on, but would then have faced retaliatory tariffs from its trade partners. Once the panel decision was announced, the US rescinded the steel tariffs.

### **MFN (Non-discrimination)**

The other main pillar of the GATT/WTO system is MFN. The Most Favored Nation principle is a principle of non-discrimination. Any two parties to a bilateral deal must extend the agreed tariff

cuts to all other countries. On its face MFN is puzzling because it allows 3rd party countries to free ride on the negotiations of others. Bagwell and Staiger give a convincing rationale for MFN in the presence of reciprocity. With reciprocity but no MFN, one or both of the negotiating countries may anticipate that its partner will subsequently do a deal with a 3rd party that takes away some of the market access gained in the first deal. Anticipating this “backward stealing” behavior, the negotiations in the first deal are hampered or destroyed. By adding in the MFN principle, the two negotiating parties have taken care of the potential deals with 3rd parties in advance. Thus they can successfully liberalize trade.

It remains true that negotiating with more countries in the deal in the first place can reduce trade barriers much more. The history of GATT/WTO negotiations is that they began in the 1930’s as bilateral deals, gained substantial growth in trade especially after World War II, and then beginning in 1962 became big multilateral negotiations. The last of these was the Doha Round, which effectively died without a deal in December 2009.

A big exception to the MFN principle is an exemption for free trade areas: bilateral discriminatory deals that achieve “substantially free” trade between the parties. Trade policy experts are divided on the implications. Some think the exemption for free trade areas weakens the multilateral framework, such that the growth of free trade areas impedes the progress toward multilateral liberal trade which brings much bigger gains. Others think that the political forces for liberal trade are kept active by the prospect of free trade agreements. A ban on free trade agreements would discourage export interests from participation in politics and result in more protectionist policies. The end result would be a reversion to more protectionism world-wide. This latter idea is illustrated with a metaphor --- liberal trade is like riding a bicycle; you have to keep moving to stay on the bike.

### **Other Views**

The Krugman and Obstfeld international trade text dismisses the terms of trade argument for protection as esoteric and unimportant practically, and it does not take seriously the idea of

GATT/WTO as an institution which promotes efficient trade policy. In contrast, there is new evidence that terms of trade effects are important in understanding trade policies of non-WTO countries: see <http://www.nber.org/~confer/2005/itif05/limao.pdf>. As for understanding the WTO, the evidence of the durability of the GATT/WTO framework argues that it serves the interests of the participants. The Bagwell and Staiger story is coherent and rather convincing to me as far as it goes.

Other trade economists note that Bagwell and Staiger have not addressed a significant political economy motive behind the GATT/WTO. While national government objectives in trade policy can easily accommodate special interest pressures (as indeed the example of sectoral employment concerns illustrates), an important aspect of international institutions is that they affect the domestic politics of member countries.

A country that joins a free trade agreement (Mexico) or the WTO (China) commits itself to constraints on its own trade policy behavior. These constraints rebound back into the structure of domestic interest group relations, affecting more than just trade policy. Such domestic political effects can be the most important reason for making such commitments by the new member government. For example, knowing that the free trade commitment is coming, less investment in import competing sectors will be made. In the absence of such a commitment, investment will be higher in anticipation of lobbying for protection. The absence of a commitment on trade policy stimulates excess investment in the import competing industry. G. Maggi and A. Rodriguez-Clare demonstrate the logic clearly.

Moreover, the domestic political effects in the foreign country can be the most important reason for the old member governments to make the offer of membership to the new member. See the discussion back in the early 1990s of the benefits to the US of Mexico joining NAFTA or of China joining the WTO, or current discussion of the benefit to the EU of Turkey's joining. Much

of elite opinion in all these cases centers on how membership will foster improvements in democracy, the rule of law and human rights in the new member.

Pushing one aspect of this internal political effects idea further, note that Mexico and China have both benefitted from tremendous capital inflows over the last 15 years, especially in the form of foreign direct investment. These capital inflows would not have been possible without the confidence of foreign investors in the security of their property. The adherence of Mexico to NAFTA and of China to the WTO gave investors assurance that formerly anti-capitalist governments would not (or not easily) revert to expropriating foreign capitalists. There is some evidence that this assurance mechanism operates independently of other forces pulling investment into these two countries. Mexican inward FDI grew much more rapidly from US and Canadian sources than from EU sources after NAFTA, according to a study by Andreas Waldkirch of Colby College (my former graduate student).

## References

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